THE EFFECTIVENESS OF THE EXTENDED CURRICULUM PROGRAMME IN THE ELECTRICAL ENGINEERING DEPARTMENT AT A UNIVERSITY OF TECHNOLOGY IN THE WESTERN CAPE, SOUTH AFRICA

by

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DECLARATION

I, Kathy Robyn Blumberg, declare that the content of this dissertation represents my own unaided work, and that the dissertation has not previously been submitted for evaluation towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

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Signed   **Date**

ABSTRACT

Students who are not academically strong are finding it very difficult to enter a tertiary institution. The requirements are of a high standard which results in many students not having the option to further their education.

The government recognised that there was a problem in this area and that the country as a whole is lacking in people with the necessary skills to improve the country and its economy.

The introduction of the Extended Curriculum Programme has given students the opportunity to enter a tertiary institution and prove to themselves that with a little guidance and an academically lengthened year they will be able to use their skills to improve their situations. The ECP has been integrated into universities in various departments allowing for a diverse amount of options for the students to choose from.

The introduction of the ECP has levelled the playing fields and allows students from all walks of life to enter an institution; however it must be noted that there are minimum requirements which are determined by the students' academic history. Many a success story has emerged from the ECP.

The course is spread over four years as opposed to three and it allows the student to settle into the tertiary lifestyle. It might take a little longer but the aims and goals have the same outcomes.

The aim of this study to see how effective the ECP is in the Electrical Engineering Department at a University of Technology and to make recommendations where needed.

ACKNOWLEDGEMENTS

I wish to thank:

DEDICATION

To my parents and friends who are too many to mention for your constant support in good times and bad and who gave me the necessary motivation to complete this paper.

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GLOSSARY

Listed alphabetically in the table below are a number of acronyms, terms, and concepts pertinent to the following research study

ACRONYM	DEFINITION
CHE	Council on Higher Education
DoHET	Department of Higher Education and Training
ECP	Extended Curriculum Programme
ECSA	Engineering Council of South Africa
HOD	Head of Department
TQM	Total Quality Management
PM	Project Management
PMBOK	Project Management Body of Knowledge
QA	Quality Assurance
QC	Quality Control
NSFAS	National Student Financial Aid Scheme
PESC	Pre-Entry Science Course
UNIFY	University First Year Programme
SADC	South African Development Community
SAPSE	South African Post- Secondary Education
NSC	National Senior Certificate
RDP	Reconstruction and Development Programmes
HE	Higher Education
CPUT	Cape Peninsula University of Technology
SWOT	Strengths, Weaknesses, Opportunities, Threats
CI	Continuous Improvement
UOT	University of Technology
FET	Further Education and Training

CHAPTER ONE:
INTRODUCTION OF THE RESEARCH STUDY

1.1 INTRODUCTION

South African universities have a high enrolment rate that does not correspond to the throughput rate (students graduating from the system) creating great disparities in the variances between students enrolled and students graduating. The government pays subsidies for the education of its citizens, and the throughput is a concern for both the universities and the government in trying to harness the high cost of putting people through a system. The university concerns stem from the fact that the subsidy given to the universities is directly related to the number of students that are put through the system. The government concern is directly that at every stage every student is subsidised, and when these students do not graduate, the government will have invested in a failed process. Besides, most of these students have financial assistance from NSFAS; this fund was set up specifically to cater for students who may dropout because of financial exclusion. There seems to be an admission though that the "material" coming from the school system (high schools) may not be correctly fitted for the university education. Consequently, there is a high failure and or dropout rate which may be a disturbing factor in the government's programs of providing sufficient skills for the development of the economy. It should be stated here that there is a multiplicity of reasons why students may fail to go through the system, most which may have to do with other social and economic conditions. This research is going to focus on the quality (more than the reason) of students coming out from the university's electrical engineering department after having been brought in through the ECP.

1.2 BACKGROUND

The ECP was developed and approved by the minister of education of the South African government in response to, among other things, the need to increase the number of blacks into the universities around the country. Black students had been excluded from the previous universities in the apartheid years and consequently the system technically excluded them from further education (Adler & Reed 2002:7). This must be understood in a holistic fashion as the failure of many blacks to get into universities had many other factors. It may be necessary to state here that the concepts of making provisions of students who do not qualify, but are accepted on special conditions are a universal

phenomenon. As early as 1977 the University of Botswana introduced the Pre-Entry Science Course (PESC) to provide a bridging course for high school students (Cantrell, Kouwenhoven, Mokoena and Thijs, 1993) who could not qualify for direct entry. This was a 7 months program intended to facilitate the transition of high students to university life, it also assisted the Botswana government in bringing in more citizens into the tertiary education space in the sciences. This effort has been implemented in different ways by different universities, and sometimes governments participate in such programmes.

1.2.1 University First Year Programme (UNIFY – The Foundation Programme)

Admission into the university in South Africa (and indeed worldwide) is dependent on the learner passed the minimum stipulated qualification (matriculation in RSA – Grade 12); this is the school leaving certificate. Van der Fier, Thijs and Zaaiman (2003:399) posit that deciding on selecting learners with the correct potential and better prospects of succeeding in mathematics and the sciences is a big problem with many universities. The university of the North at its inception introduced the UNIFY programme whose specific aim was to increase the number and quality of black students entering the mathematics and sciences disciplines. This was a one year programme (contrary to PESC with 7 months) and the foundation programme enabled students to move into other universities and take up degrees in any science related discipline (Mabila, Malatje, Addo-Bediako, Kazeni and Mathabatha, 2006:295-304). Consequent to the establishment of UNIFY (the fore-runner of these foundation programmes in South Africa), many other universities adopted the system and started offering similar programmes sometimes with some variations. A few can be mentioned here; University of Pretoria Science Foundation Year (UPFY), The University of the North West Foundation Year Programme and The University of Venda Foundation Year Programme. The programmes were very identical to the fore-runner programme, UNIFY, and the focus of these programmes was largely the same. This is summarised in table 1.1 below.

Table 1.1: The objectives of the Foundation Year Programmes

Help with transition to university	Increase the number of science students
Improve quality of science applicants	Reverse effects of bad high school learning
Provide bridging for disadvantaged students	Give hope to students with poor background

Provide second chance to failed matriculants	Provide motivation for career in sciences

Source: own construction

The socio-economic condition of the large part of the South African black comprises of uneducated, unskilled and chronically poor parents. The general population of the black South Africa is rural (Adler & Reed 2002:7) with and the schools have poor resources with very little of quality science education. This is compounded by the critical shortage of science teachers in the country (specifically in the rural areas) with little education facilities in good shape in the country. South Africa still has high schools in the country side without toilets (Adler & Reed 2002:8) let alone good laboratories for proper teaching of physical sciences and mathematics. The result therefore is that a large part of the black rural student population may not perform well in their high (they sit for the same exam with learners from well-equipped high schools). The rural pass rate has continued to be low (Adler & Reed 2002:8) even after the Minister of Education lowered the minimum pass rate; universities continue to demand for a standard suitable for quality education.

(Mabila, *et al* (2006:295-304) described a typical profile or prototype of a foundation programme student of the University of the North (now University of Limpopo – UL) as tabulated with author's comment below. Table 1.2 is an illustration of that profile.

Table 1.2: Profile of a typical Foundation programme (now - ECP) aspirant

Type of high school	Poorly set up old school, too often learners use make shift ergonomically unsuitable buildings not conducive to learning. In instances learners learn under trees of barn sheds to protect them from the sun (Adler & Reed 2002:6).
Conditions at high school	Laboratory facilities are generally very poor or absent altogether and buildings regularly vandalised. The facilities, if present are generally inadequate for effective tuition as required to meet matric standards (Adler & Reed 2002:7).
Location of high school	Schools generally standalone isolated structures in the middle of the jungle with no other supporting structures. Too far from other schools and learners travel long distances on foot to go to the nearest semi-furnished poor high school (Adler & Reed 2002:7)
Staffing at the school	Because of distance from urban centres and the absence of facilities most subject teachers – especially those that are in demand, are difficult to employ at such schools. This

	is compounded by the shortage of teachers in a country without adequate teachers' training programs, specifically for sciences.
Family background	Most learners are first generation matric candidates, let alone aspirants for university education. There are no role models nor enough of those that can advise on both how to study from within the family – purely a non-academic background.
Socio-economic status	Chronically poor background without much of other facilities and daily needs, too often learners go to school hungry. The absence of earning capacity in the family gives too much pressure leading to low self-esteem and loss of success prospects (Adler & Reed 2002:8)
Lack of motivation factors	Distance from centres of influence, scanty knowledge about what to do, the absence of family members who may assist with tuition for the subjects, causes despondence amongst the learners (Adler & Reed 2002:8)
Lack of focus on schooling	Life focus is put on immediate needs and solutions without any projection to a well-planned future beyond schooling. Going to school is more as a formality because everyone has to go to school at that age.

Source: own construction (Summary of literature reviewed)

Therefore the student coming to the university may not be well prepared economically, socially and academically (Garraway 2015:1). There is therefore a general understanding that the presence of poor results is not directly the result of a learner without the necessary intellect to acquire a science degree. Intelligence is genetic (Garraway 2015:1) and not going to school or getting a good education is not a direct measure of one's intelligence. Other factors are considered to have altered what could have otherwise been a successful matric graduate, all things being constant. Kasanga (2003:217-218) states that the performance of a learner is a sum total of many other factors, and the list of factors is reported in table 1.3 below.

Table 1.3: Other factors contributing to poor performance at Grade 12

Lack of discipline	Inadequate relevant skills transfer
Insufficient resources	Classroom environment
Poor moral	Pupil teacher ratio

Policy implementation problems	Inadequate parental involvement
Poorly trained teachers	Lack of funding
Poorly equipped laboratories	Unresponsive department of education

Source: Adopted from Kasanga 2003:217-218

Nkuna (2002:5) attributes these factors to the apartheid separate development system in which mathematics and sciences were discouraged amongst black schools thereby creating a generation of people who cared little for these subjects. Once the apartheid system was changed, there was a sudden shortage of mathematics and science teachers in the rural areas. Generally, no whites or coloureds take up teaching in the rural structures of the country, with the consequences of a critical skills shortage in these schools. These contribute as other factors that may hinder the process of learning mathematics and sciences in the country side. Mabila, *et al*, (2006:295-304) posits that these students receive their learning at ill-equipped schools where there are no opportunities and programmes that could help them realise their full potentials. Thus they are referred to as disadvantaged students, meaning, it is expected that for some of them getting the opportunity in a conducive environment, they could have done better.

The government therefore set out to try and accommodate or facilitate better learning or re-learning that would identify potential graduates. The problem of disadvantages is pre-dominantly a black issue (Nkuna, 2002:4) since the removal of people to the homelands was meant for blacks only. No whites, coloureds or Indians had homelands, it was the Africans only who were removed from towns and still dispossessed of their land. The current status quo is therefore largely a legacy of the apartheid structure, even though by now tremendous improvement should have been brought to the African populous. The problem of poor high school results can be traced back to primary school education which remains grossly disadvantaged in the current dispensation. Howe and Plomp (2002:603-615) posit that their research findings have established that there is little difference in knowledge of mathematics between a Grade 8 and Grade 12 pupil. This creates a problem for universities taking learners into the system whose mathematics knowledge is so low, considering the high standards of South African education on the continent. If anything these damning findings necessitate radical transformation of the education system if there is to be any meaningful difference in the type of learners that will be applying for university entrance (Gouws, 1997:143).

1.2.2 Extended Curriculum Programme (ECP) As the Panacea

Universities have independent of government intervention, intervened to try and rescue the situation by making provisions to accommodate students into their different programmes. Foundation Programmes have been amongst the South African universities for a while now, evidence that the problem between high school graduation and university entry has been around for a while. The government did not adopt the universities' initiative of the Foundation Programme, instead came up with two programmes, namely; Second-Chance and Dinaledi (Sotho word for Stars). The government tried government's intention was to boost both the quality and the quantity of the black learners doing mathematics and sciences. Monare (2003) reporting in the Sunday Times of the 7th of September referred to them as having produced "twinkles and no stars." These aspirations have failed because of, among other things, inadequate training, bureaucratic bickering and lack of funding.

Considering that only 2 out of 10 Grade 12 learners become graduates, it is critical that South Africa as a country, and SADC as a region should intervene. The new programme (ECP) is meant to substitute in a way the former Foundation Programmes. It may be necessary here to draw up a list of similarities and differences between the Foundation Programmes and the Extended Curriculum Programme. The table 1.4 below illustrates some features of these two programs.

Table 1.4: Features of the FP and the ECP

EXTENDED CURRICULUM PROGRAMME	FOUNDATION PROGRAMME
Full year doing part of first year subjects	Full year bridging into university study
Not a standalone certificate for student	Stand-alone certificate is awarded to student
Cannot be used as exit point by students	Can be used as exit point by student
Passing guarantees continuation in varsity	Passing does not guarantee admission
Government funded programme	Self-financed and no government help
Takes 5 yrs. to complete 4 year degree	Takes 5 yrs. total to complete 4 year degree

Source: own construction

Each one of the programmes has its own advantages and disadvantages; somehow the Foundation Programme has been discontinued by many universities. The Foundation Programme served as a matric certificate for many students who had failed matric, the current extended product does not provide an exit certificate for those who want to discontinue. Whatever the current situation, the ECP has become the "in thing" with most universities adopting the programmes, possibly because there is government subsidies for these programmes.

The ECP was pronounced by the Minister of Higher Education with the stated aim as alluded to above. The enrolment in these programmes is predominantly black and seeks to assist more blacks to get entry into the university, where otherwise they would not have qualified. According to Garraway (2015:1) extended curriculum programmes is for students who do not qualify through the normal entry channels, in this programme the students are provided with support to understand university subject knowledge to enable them to go through university. The introduction of the ECP is to eliminate under-preparedness of the students who are entering tertiary institutions for the first time. The program was intended to help reduce the drop-out and failure rate of students entering university, in the same way that UNIFY was successful (Jansen, Ntshingila-Khosa and Cranefield, 2004:44). This would allow for proper skilling which would, with the students graduating, help reduce poverty in poor black families. The failure rates have an impact on the public money invested on these students with them ending up as unemployed university dropouts. The country has a disturbingly high skills shortage (Grobler, Wärnich, Carrell, Elbert, and Hatfield (2006:46) and the failure impacts negatively on the national plan to empower blacks through skills development.

1.2.3 Origins of the Extended Curriculum Programme

Foundation programmes have been in existence in various forms for three decades in South Africa, and much experience has been gained. (Council on Higher Education 2013:70). The Council on Higher Education (CHE) (2013:70) explains that the ECP was developed in the early 1980s for universities so as to widen access to disadvantaged yet talented African, Coloured and Indian students, as their accessibility to universities were restricted by legislation. At the time this was known as Academic Development (AD) programmes. In 2006 the foundation programme was developed and implemented in South Africa (Machika 2013:1). It had been in existence as universities initiatives and not government programmes – UNIFY, UPFY, etc. According to Garraway (2010:31) the term 'foundation programme' is often used to refer to learning activities at the lower

end of the higher education band that is intended to enable students from disadvantaged educational backgrounds to acquire the academic foundations necessary for succeeding in higher education. However, since national policy does not provide for foundational qualifications, the term 'foundation programme' does not agree with the formal definition of a programme which is a purposeful and structured set of learning experiences that lead to a qualification. In the interests of consistency and clarity, the term 'foundation provision' will be used in preference to foundation programme and the term 'extended curriculum programme' is used to refer to a whole degree or diploma programme in which the foundational provision is located. The programme is presently referred to as the extended curriculum programme. According to CHE (2013:71) the foundational provision is intended primarily to facilitate the academic development of students whose prior learning has been adversely affected by educational or social inequalities. Foundational provision is thus aimed at facilitating equity of access and of outcomes. In order for the ECP to be successful, it has to align itself to the teaching methodologies and approaches of the mainstream in order to make the transition easier for the student. The ability of the student also needs to be taken into account and whether or not they can cope with the demands and work load once they have exited the ECP and become integrated into the mainstream.

1.2.4 Purpose and role of the Foundation Programmes

According to the CHE (2013:70) the purpose of the extended programmes is to allow underprepared students the opportunity to study and achieve their potential at tertiary level. Foundation programmes' main aim was to allow students to link access with success by bridging the secondary-tertiary gap. According to CHE (2013:71) their twin purposes are firstly to enable access to be widened in a responsible way by offering entry-level provision that can meet the needs of talented but underprepared students. Historically, extended programmes have primarily targeted students who do not meet an institution's regular admission criteria. The ECP is also able to provide students who are underprepared for standard first-year courses with sound academic foundations that help close the articulation gap and enable them to succeed in completing their studies. The provision of access has, however, often not been adequately followed through with strategies to promote effective learning later in the curriculum. According to Bozalek, Garraway &McKenna (2011:1) student learning involves that the educator provide the learner with the relevant knowledge, and that the learner would therefore synthesise the knowledge into meaningful content.

1.2.5 ECP philosophy

The teaching philosophy behind the ECP is to provide intensive teaching in the subjects that will allow the student to grasp concepts and apply their minds in order to improve their skills. Garraway (2015:2) states that there is a vast amount of students that are entering higher education in South Africa that are experiencing problems resulting in an excessively high failure rate, repeater and dropout-rates with disadvantaged students performing significantly worse. The ECP is designed to help students that are not fully prepared to cope with the shift from school to tertiary level education. According to Machika (2013:1) the implementation of the ECP by the Department of Higher Education and Training in 2006 has given students the opportunity to be allowed access to different programmes with the necessary support to achieve success. According to Nelson Mandela Metropolitan University (2015:1) the ECP aims to provide academic support and skills development which will be integrated with regular academic work. In the first two years the ECP students are equipped with the necessary skills and competencies needed to complete their studies successfully. Garraway (2015:2) states that the ECP is not a different programme from the mainstream, but rather an extension of the regular mainstream with additional content and time taken to complete the curriculum. The processes and techniques that need to be in place will be the determining factor into whether or not the implementation of the ECP can be successful.

1.2.6 ECP course structure

Garraway (2015:3) states that ECP courses are extensions of mainstream subjects, the main difference being the additional content and activities increasing time on task and student engagement with the subject matter, i.e. more time with more tuition but not just more time. The different programmes are illustrated in table 1.5 below.

Table 1.5: Comparison of ECP and mainstream programmes:

Course and course code	
Semester 1: Mainstream	**Year 1:**
Mathematics 1 MAT107S	**Extended Programme Mathematics 1 MAT107X**
• Do calculator computations and graph sketching • Complex numbers • Apply De Moivre's theorem and Euler's formula in the manipulation of complex numbers • Trigonometric equations and the	• Includes the syllabus of MAT107S • All topics are extended through more basic examples and applying mathematics to elementary engineering examples • Introduction to using Excel and Omnigraph • Euclidean Geometry

• sine function • Radian measure • Manipulations of formulae • Pascal's triangle, the Binomial theorem and limits of functions • Use tables and rules to calculate derivatives of functions • Apply differentiation in graph sketching, optimization and velocity and acceleration problems • Use tables and standard integration techniques to integrate functions	• Ratio, proportions and percentages • Areas and volumes • Mathematical and statistical techniques • Problem based integrated practicals dealing with concepts such as forces, equilibrium, moments, structures, volumes, friction, linear motion, conservation of energy, lifting machines, momentum, pulleys, gears, pneumatics, environmental engineering and introduction to robotics • Peer marking used as a formative marking tool
Electronics 1 ELT100S	**Extended Programme Electronics 1 ELT101X**
• Identify specific electronic components and understand their values • Understand the basic operation and characteristics of the diode • Understand the application of the diode as a rectifier • Understand the basic operation of a bipolar junction transistor • Understand the basic operation of an operational amplifier • Understand the basic operation of and be able to use standard laboratory equipment • Problem based integrated practicals	• Includes the syllabus of ELT100S • Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in depth perspective using many additional examples and explanations • Problem based integrated practicals dealing with concepts of the curriculum • Tutor assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus • Various additional formative evaluations will be done, both in the classroom and the laboratory
Electrical Engineering 1 ELE100S	Extended Programme Electrical Engineering 1 ELE101X
• SI system of units, Ohms Law, calculation of resistivity, temperature and conductor circuits • Construction of primary and secondary cells, internal resistance in a resistive circuit, charging circuits, performance of voltage cells, ampere-hour rating and performance under load • Analyse resistive networks using Kirchhoff's Laws, voltage and current dividers, two wire distribution networks	• Includes the syllabus of ELE100S • Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in depth perspective using many additional examples and explanations • Problem based integrated practicals dealing with concepts of the curriculum • Tutor assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus • Various additional formative evaluations will be done, both in the

• Alternating current theory, sinusoidal network calculations including peak value, rms value, average value, frequency, time period, wavelength and phases • Electromagnetism, magnetic flux, induced emf, flux density, Faraday and Lenz's Law, construction and use of digital and analogue meters, Megger instruments • Magnetic circuits, MMF, magnetic field strength, permeability of free space, calculations, Kirchhoff's laws in magnetic circuits, hysteresis loops, magnetic leakage and fringing, Eddy current losses • Inductance, self-inductance calculations, coupling coefficient, and dot notation, energy stored in an inductive circuit, graphs • Capacitance, electronic charge storage, calculations on electric flux, electric density, electric field strength, graphical interpretations and calculations on voltage and current in a CR circuit • AC analysis, reactance and impedance, complex notation, series and parallel AC RLC circuits using Kirchhoff's Laws, real, reactive and apparent power, power factor, power triangle for RLC circuit • Problem based integrated practicals	classroom and the laboratory
Digital Systems 1 DIG100S	**Extended Programme Digital Systems 1 DIG101X**
• Binary numbers, decimal-to-binary conversion, binary arithmetic, 1's and 2's complements of binary numbers, signed numbers, arithmetic operations with signed number, hexadecimal numbers, octal numbers, binary coded decimal (BCD), digital codes, digital system application • Logic gates, the exclusive OR	• Includes the syllabus of DIG101X • Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in depth perspective using many additional examples and explanations • Problem based integrated practicals dealing with concepts of the curriculum • Tutor assisted sessions using peer help as a formative mechanism to

and Exclusive NOR gates, integrated circuit logic families, Boolean operations and expressions, laws and rules of Boolean algebra, DeMorgan's theorems, Boolean analysis of logic circuits, simplification using Boolean algebra, standard forms of Boolean expressions, Boolean expressions and truth tables, the karnaugh map, karnaugh map SOP minimisation • Special combinational logic circuits and implementing combinational logic, the universal property of NAND and NOR gates, combinational logic using NAND and NOR gates, operation with pulse waveforms, adders, comparators, decoders and encoders, code converters, multiplexers (data selectors), demultiplexers • Latches, edge-triggered flip-flops, master-slave flip-flops • Flip-flop operating characteristics, flip-flop applications, basic asynchronous counter operations, shift registers • Problem based integrated practicals	reinforce all the concepts of the syllabus • Various additional formative evaluations will be done, both in the classroom and the laboratory
Course and course code	
Semester 2: Mainstream	**Year 2: ECP**
Mathematics 2 MAT206S	Mathematics 2 MAT206X

• Revision of S1 syllabus • Inverse trigonometric and hyberbolic functions • Optimization and rates of change • Partial differentiation • Integration by part, Integration by Partial Fractions, Integration by Completion of the square, Powers and products of trigometric functions • Methods of differential equations • Use the Newton – Raphson Method to solve equations • Use the Simpson Rule to find areas under curves • Use the Euler method to solve differential equations	• Covers the subject material of Mathematics 2 • Intensive lecturers, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations • Problem – based integrated tutorial sessions dealing with concepts of the curriculum • Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus • A week – long visit to an agricultural farm where integrated problem statements will be given to the learner in groups of four learners. Multi - disciplinary work will be done, and they will be assessed daily. They will stay on site. • A two day portfolio conference will be held where the learners will present their project work complete on this syllabus, as well as the applicable projects of the farm visit • Various additional formative evaluations will be done, both in the classroom and in the laboratory.
Electronics 2 ELT200S	**Electronics 2 ELT200X**

• Introduction to bipolar junction transistors and small signal analysis, this section is a review on some of the transistor concepts that have been covered in electronics I. • Derivation of transistor AC equivalents (CE,CC,CB) • Analysis of Multistage amplifiers • The differential amplifier • Introduction to field effect transistors and small signal analysis • Analysis of FET amplifier configurations(Common source, Common drain, Common gate • Introduction to operational amplifiers • Op-amp configurations with negative feedback • Amplifier frequency response and general concepts • Low frequency response • High frequency response • Total frequency response • Introduction to voltage regulation • Applications of voltage regulators	• Covers the subject material of Electronics 2 • The use of P-Spice package to facilitate the design and analysis of a small-signal amplifier according to a given specification • Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations • Problem – based integrated tutorial and practical sessions dealing with concepts of the curriculum • Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus • A week – long visit to an agricultural farm where integrated problem statements will be given to the learner in groups of four learners. Multi – disciplinary work will be done and they will be assessed daily. They will stay on site • A two day portfolio conference will be held where the learners will present their project work complete on this syllabus, as well as the applicable projects of the farm visit • Various additional formative evaluations will be done, both in the classroom and in the laboratory
Electrical Engineering 2 ELE200S	Electrical Engineering 2 ELE200X
• Single-phase • AC networks • Three phase circuits • Power factor correction • Resonance • Harmonics • Network analysis • Electrical safety	• Covers the subject material of Electrical Engineering 2 • Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations • Problem – based integrated tutorial and practical sessions dealing with concepts of the curriculum • Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus • Intensive lectures, exercises and

	tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations
	• Problem – based integrated tutorial and practical sessions dealing with concepts of the curriculum
	• Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus
Digital Systems 2 DIG200S	Digital Systems 2 DIG200X

After completing this course, the student must be able to:
SECTION 1
• Explain the operating characteristics of pulsed circuits.
• Utilise FLIP – FLOPS in basic application
• Explain how retriggerable and non – retriggerable one- shots (monostables) differ
• Connect a 555 – timer to operate as either an astable multi vibrator or one – shot
• Explain the operation of Schmitt – trigger circuits
• SECTION 2
  Design the following sequential circuits:
  a) Up, down and reversible synchronous presettable modulo N counters with J K flip – flops
  b) Forced entry into the count cycle for modull < 2^n (N = Number of flip- flops) using the asynchronous inputs
• Draw timing diagrams for all the above counters including the state diagrams and applicable tracing tables
• Cascade IC counter chips to obtain large moduli, using both the CLEAR as well as the PRESET method
• SECTION 3
• Describe applications of digital – to – analog and analog – to – digital conversion.
	• Covers the subject material of Digital Systems 2
	• Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations
	• Problem – based integrated tutorial and practical sessions dealing with concepts of the curriculum
	• Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus
	• Intensive lectures, exercises and tutorials on all sections, from a subject specific perspective, concentrating on an intensive and in-depth perspective using many additional examples and explanations
	• Problem – based integrated tutorial and practical sessions dealing with concepts of the curriculum
	• Tutor – assisted sessions using peer help as a formative mechanism to reinforce all the concepts of the syllabus
	• Four industrial visits to SAB, National Panasonic, Consul glass and the power control centre in Newlands

- Explain D\A conversion by the binary – weighted input method and by the R\2R ladder method
- Explain A\D conversion by any of the following processes: flash (simultaneous), stair case – ramp, tracking, single – slope, dual slop and successive approximation
- Explain and analyse basic sample and hold circuits
- SECTION 4
- Explain the characteristics of the following logic families:
  a) TTL, CMOS, I²R AND ECL
- Assess the practical uses of TTL and CMOS circuits
- Compare TTL and CMOS characteristics
- Summarise the basic operational characteristics and parameters of these logic families
- Interface different logic families
- Use data books and correctly interpret the different data sheets
- Explain the concepts of IC manufacture
- SECTION 5
- Identify the need for memories in digital systems
- Explain what a ROM is and how it works and how it can be programmed
- Differentiate between ROM's and the various types of PROM's
- Explain what a RAM is and how it works
- Explain how ROM's and RAM's are used in microprocessor – based systems
- Explain the difference between static RAM's (SRAM's) and dynamic RAM's(DRAM's)
- Use PLD's to implement Boolean logic functions
- SECTION 6
- The use of BCD – to – seven – segment decoders and LED's or LCD's in display systems.
- The use of application of dot matrix displays

• SECTION 7 • Introduction to the PIC family of micro-controllers	
Semester 2	**Year 3:**
Level 3 subjects	**ECP integration**
Semester 3 and 4	**Year 4**
Completion of diploma	**Completion of diploma**

Source:(ECP Strategic Management Guide 2012:Z2)

The difference between these two offerings is therefore primarily the workload given to the ECP students in the first two years of their university life. It can be hypothesised that the assumption made here is that, provided with more learning time, the students will be able to perform equally. Thus all ECP courses are credit bearing and contribute towards the total credit required for the students' qualification, thus there is no difference between the two cohorts at the completion of the qualification. Because ECP always involves an additional year of credit bearing courses and each qualification is only permitted a fixed number of SAPSE (South African Post-Secondary Education) credits, the regular credit is now divided over four years for the ECP students. This means that ECP students receive less credit each year as compared to mainstream regular students, as indicated in table 1.5 above. There are thus implications for transfer between ECP and mainstream as students may not accumulate sufficient credit to graduate.

1.2.7 Criteria for placement on the ECP

Garraway (2015:2) states that students that would like to study at a tertiary institution must meet the minimum NSC requirements for entry onto a Diploma or degree as stipulated in Government policy (2001:6). Many students lie in the peripheries (border line) and these are technically not eligible for the regular entry into the tertiary programmes. Yet, on the other hand, they appear to be "promising candidates" if they had another opportunity. This will increase the enrolment rate as it is allowing access to students who would not have been considered in the past. According to CPUT (2014:1) The ECP students are identified by their academic results from grade 12 and on any other academic programmes that the student has attended. The philosophy and theory behind the ECP has given opportunities to students who in the past may not have had a chance to study at a tertiary institution. The main philosophy behind the ECP is to

provide teaching which is intensive in all areas, which would inevitably help the students to adapt to the environment that they find themselves in. This will have the same outcomes over a longer period. It must be noted that the ECP and the mainstream course content is the same and that students will graduate with the same diploma. The DHET has made a considerable contribution in ensuring that the ECP is available to all students which will improve skills and student output in the long run.

1.3 PROBLEM STATEMENT

The primary school and secondary school education system has been constantly blamed for not producing high quality students suited for the globalised community we live in. There has been no noticeable change in the quality of education at these levels even though more financial resources have been poured into education. As alluded to earlier the mathematics literacy levels of Grade 8 show little difference with those of Grade 12 pupils even though there is a 4 year gap between them. Contrary to this, South African universities (the first 3 best are South African) rank amongst the highest on the continent with 11 South African universities out of the top 20 universities on the continent. The University of Technology under study ranks as the 16th best university in the continent, but the university has extensive ECP running across all disciplines. The disparity therefore between the high school education and the university standards creates a need for investigating the throughput quality of the ECP students who are admitted as "at risk" students and yet manage to go through the system. The research therefore seeks to track these students in the system and establish the quality of the exit ECP product given the extended costs put into this program.

1.4 RESEARCH OBJECTIVE

An objective is essentially the intended outcome of any undertaking, in this research there are specific expectations from the research. These have been broken up into two categories, the primary objective and the secondary objectives.

Primary objective
- To establish the acceptance of the quality of students coming from ECP as seen by the department offering the program.

Secondary objectives
- Establish if the decision to have the ECP was / would have made any difference if these students had been admitted directly.

- Establish if the cost of the ECP program is justified given the quality of the students coming from the system.

The secondary objectives are extracted from the primary objective with the understanding that the department personnel may, through the research, see no difference in the quality of the students coming from the mainstream compared to those coming from the ECPs. This leads to the main research question for the study.

1.5 RESEARCH QUESTION

The research question is meant to guide the study (Jowah, 2015:77) in that it defines the scope of the study. This research question is also expected to lead to the solving of the problem as stated in the problem statement, within the objectives set for the research. The research question hereby asked is;

Does the ECP produce the same quality graduates as those from the mainstream?

This research question led to sub-questions derived from this main question in that there are aspects of the research question that needed to be clarified. By introducing sub-questions, this further redefines the scope of the study in a more specific way.

Sub-questions
- What problems do lecturers have with ECP students different from mainstream students?

- Are there any ECP students that outperform mainstream students when they write the same exams?

- Can the lecturers distinguish in class the difference between a mainstream student and an ECP student?

1.6 RESEARCH DESIGN AND RESEARCH METHODOLOGY

Research design is a road map or plan to be followed during the implementation of a research project (Jowah, 2015:102). The plan indicates what is to be done clearly defining the time lines for the program to be undertaken. Essentially the research design seeks to answer to the question "what in the planning of a research project. On the other hand, there is another term, research methodology, too often interchangeably used (wrongly so according to Jowah, 2015:103). Research methodology is said to be focusing on the "how of the what" meaning whatever is to be done, research methodology states how it will be done. It is defined as the "how to do the tasks stated in the research design" indicating specifically the *modus operandi.* Blumberg (2008:67) concurs and posits that the design will primarily indicate what type of research, what

type of population, the type of the sample to be surveyed, what method will be used for the sampling, what type of data is required for the research, what type of data collection instrument, what methods will be used to analyse the data and what the purpose of the research is. The research methodology advised on how the research was to be conducted, how the population was to be selected, how the sample was selected and how the sampling was done, how the data was to be collected and how the data was to be analysed. Research methodology is further classified as having two types, namely qualitative and quantitative methodologies. The differences are primarily to do with the size of the samples, the relationship between the researcher and the researched, the focus of the research, and many other aspects.

These two different methodologies are sometimes opposed to each other and sometimes complement each other. The use of both methods too often is complementary and allows for a holistic understanding of the problem. The researcher decided to use both methods to maximise the benefits derived from this approach.

1.6.1 Target population

The population under study was the lecturers and the HODs in the ECP of the electrical engineering department of the university under study. The lecturers have a full understanding of the difficulties or performances of the ECP candidates.

1.6.2 Sampling frame

The sample frame is comprised of all the lecturers, assistant tutors and all other staff members directly involved with the learning of these ECP candidates. There are 19 personnel involved altogether in the department, including the HOD.

1.6.3 Sampling method

There will be no sampling; it will be rather a census, all the participants will be respondents except if any refuses to be involved in the research. The higher the size of the sample the better the results. In this case the sample frame is small, and there are no extra costs or inconveniences emanating from interviewing everybody.

1.6.4 Sample size

The sample size is simply everyone in the department directly involved with the ECP candidates, there are 19 people altogether including the HOD.

1.6.5 Data collection instrument

A semi-structured questionnaire was constructed and used to collect data for the research. The questionnaire was divided into three (3) parts as follows;

SECTION A – Biography necessary to confirm the suitability of the respondents to participate in the research and indicating what subjects they offered.

SECTION B – Likert scale with rankings of up to 5 enabling the respondents to rank according to predetermined statements / hypotheses.

SECTION C – Open ended questions with provision for the respondent to say whatever they felt would be important or needed to be known about the performance of the ECP candidates.

The instrument was constructed, pre-tested using six of members in the department who made comments about the questionnaire. After reworking the questionnaire, the tool was sent to the university statistician who assisted and put the final touch on the instrument.

1.6.6 Data collection method

The researcher personally distributed the questionnaires to the respondents and responded and explained any sections that may not have been clear. All the questionnaires were filled in, and collected on the same day. This method was found to be most ideal as it reduced a low response rate (there was a 100% response) given the size of the population under the survey.

1.6.7 Data analysis

The questionnaires were subjected to cleaning and editing before coding them for data capturing purposes. These (data) was captured on to the Excel Spread sheet and frequency polygons, histograms, bar charts, pie charts, tables and graphs were constructed to test for relationships of the variables under study. The illustrations were interpreted and a report was written from that.

1.7 ETHICS CONSIDERATION

To avoid allowing unscrupulous researchers, the ethics rules were considered and implemented. All participants had full explanation of what was going to be done, why there was this research, they were informed of the importance of their participation in

the project. It was also stated unequivocally that no information was going to be passed to anyone concerning the individual contributions to the research. The staff voluntarily contributed to the research as they thought they had contributions to make to the running of this programme.

1.8 SIGNIFICANCE OF THE RESEARCH

Time vs. quality and the end product that is produced at all levels has been a major field of research in the past decades and will probably continue to be a popular field in the future. It has become an integral part of tertiary education to find a balance between the throughput of students and the quality of student that enters the job market.

Evidence suggests that a project management approach to tertiary institutions has over the last decade gained momentum. The adoption of a project management methodologies tools and techniques approach as an alternative to the management of the institution that is of a non-traditional single type project nature indicates a leaning towards innovative and progressive management practices. However, academic research reveals that evidence of the potential convergence and integration of such methodologies applicable to the running of the institution level strategy processes is negligible.

However institutions continue to follow traditional linear business process models. This status quo presents a potential opportunity for institutions in the Southern African and emerging economies to consider the adoption of innovative business level strategies directed at generating significantly higher value outputs capable of establishing a sustainable competitive platform against other institutions within the region.

The significance of this study is to show that the introduction of the extended curriculum programme does not only increase the amount of students at tertiary level but will also increase the throughput with the students being of a quality that is acceptable to the market place.

CHAPTER ONE - Provides an introduction to the study, gives literature review and theoretical background to the study, establishes a study gap emanating in the problem statement, research objectives, research question, research design and methodology, population, the instrument, data collection, data analysis and ethical consideration ending with chapter classification.

CHAPTER TWO – discusses the backgrounds of the candidates, emphasising on socio-economic factors that may be considered to negatively impact on learning, the type of high schools in South Africa, the standard of that education and the problems with transition to tertiary.

CHAPTER THREE – discuss international models of addressing and assisting the disadvantaged communities – India with the *Harijans*, Australia with the Aborigins and USA with the Afro-Americans. The structure of the South African ECP and the intentions of the system, and the funding involved.

CHAPTER FOUR – details the research design and research methodology used with description of the qualitative / quantitative methods, population, sample frame and sampling technique, the instrument, data collection, data analysis and the reporting pattern for the findings.

CHAPTER FIVE – Results – data and interpretation therefore provided in question and answer format as structured in the questionnaire. Detailed information provided in explanation of the diagrams and relationships explained.

CHAPTER SIX–Summary of the findings, putting final interpretation to the findings and making conclusions, recommendations and limitations of the study. Tips for future studies end the thesis.

1.9 CONCLUSION

The current trend in tertiary education is that it is moving towards a higher quality with higher accurate budgets and good scheduling on the courses that the institution provides. The reason for this to have taken place is that it is a very competitive industry and time is a factor that has continuously decided whether or not an institution is capable of delivering a good quality student on time. Potential students' attitude towards the final product plays a major part in determining whether or not they will be entering the institution or using the services of the institution in completing their studies.

Planning of delivering of the course has to be done in advance to ensure that it gets delivered on time and that it meets the requirements of the student. Quality has to be the number one priority in any institution in order to be competitive. However the time that it takes will determine whether or not the student was produced at the highest quality. Therefore it can be said that there is a definite relationship between time taken to complete a project and the quality of the project.

CHAPTER TWO:
FACTORS IMPACTING ON POOR HIGH SCHOOL RESULTS AND HOW THEY IMPACT ON THE PERFORMANCE OF LEARNERS IN HIGH SCHOOL AND UNIVERSITY

2.1 INTRODUCTION

In this chapter the author discusses the backgrounds of the candidates, emphasising on socio-economic factors that may be considered to negatively impact on learning, the type of high schools in South Africa.

2.2 PSYCHOLOGY OF LEARNING

The landscape of the South African educational system has changed dramatically over the past few years. With the abolishment of apartheid it has come to the fore that the educational gap between the rural areas and the urban areas is quite significant. According to Boekaerts (1996:1) the students' personality and their backgrounds can influence the process of adapting to their educational environment and the methods of learning. Behaviourism is a theory based on the idea that all students behaviours stem from their experiences that they have acquired. (De Houwer, Barnes-Holmes & Moors 2013:1). In the 1960's the theory of behaviourism was replaced by the cognitivist revolution. Cognitivism focuses on the processes such as the use of the inner mind by problem solving, thinking and the use of knowledge. In part, the gap between school and university is a lack of meta-cognitive and thinking skills as well as students' capacity for independent learning (CHE 2010:109).

The ECP encourages students to apply their minds as it gives the opportunity for the student to pose questions pertaining to the work that is being covered. The Foundation for Critical thinking Garraway (2015:1) puts emphasis on this method by comparing it Socratic teaching. The main focus of this style is to pose questions to the students. This will allow the student to find the answers by using the necessary research technique thus improving their discipline, logic and thought processes. According to Zumbrunn, Tadlock, & Roberts (2011:1) self- regulated learning can be used to put more emphasis on problem solving in the classroom. This method encourages dialogue between the lecturer and fellow students which encourages the sharing of ideas which can be used to find a solution.

2.3 HIGHER EDUCATION UNDER APARTHEID

South Africa became a democracy in 1994. However the problems that were associated with apartheid were quite evident. Bunting (2004:35) puts into perspective the challenges that were to face the new democratic government. The higher education system was fragmented and had no management structure. The main cause was the result of the apartheid government conception of race and the politics of race, which had an influence on the higher education policy framework during the 1980's. Bunting (2004:35) states that most of the problems that would emerge from the then National Party were that they had divided South Africa into five entities. These were known as Transkei, Bophuthatswana, Venda,Ciskei and the Republic of South Africa which held most of the land. The four entities were considered to be legally individual countries. The international community never recognised these countries as they were formed by the Apartheid government. By 1985 a total of 19 higher education institutions had been designated for the use of Whites, two for Coloured, two for Indians and six for the use of Africans. The six institutions did not include the seven that were in the independent countries. The aim of which was to have all the Africans eventually relocated to study in those institutions. Bunting (2004:37) mentions that the National Party government restricted different race groups from enrolling in universities that were designated for a race group. By the beginning of the 1980's the government had made such distinctions between where students could study they decided to split institutions into universities and technikons. The differences being that a university was looked upon as a scientific institution and the technikons was technology based. The government at the time believed that universities had to concentrate on scholarly activities involving the generation of new knowledge and the technikons had to use the application of knowledge. This did not mean the technikons were inferior to universities it just meant that the disciplines of science and technology were separated.

Bunting (2004:52) concluded that the ternary institutions under Apartheid were designed in such a way that it favoured the White majority. By 1994 the landscape of the 36 higher education institutions included ten historically disadvantaged universities and seven historically disadvantaged technikons designated for the use of black (African, coloured and Indian) South Africans, while ten historically advantaged universities and seven historically advantaged technikons were designated for the exclusive development of White South Africans. Two distance institutions catered for all races

2.4 IMPROVING ACCESS TO HIGHER EDUCATION

CHE (2004:13) states that post-apartheid there is a high demand for social transformation, reconstruction and development. Bunting (2004:52) mentions that by 1994 there was a huge resistance to the Apartheid regime from both African and White institutions and change was imminent. CHE (2004:13) emphasises the fact that it is important that public resources and energy be directed towards higher education. The reasons for this are simple. Higher education with its many institutions scattered around the country have immense social and public value. Their contribution to society in the form of skills and uplifting communities should be enough reason to have a share in public resources. CHE (2004:14) mentions that since 1994 the democratically elected government has set out to achieve a better life for all. Their main focus has been economic development, to reconstruct the entire social system and to reintegrate successfully into the international community. This has escalated the demands on higher education. According to CHE (2004:14) Higher education has put together a set of purposes. It is important that in present day South Africa these purposes must in some way contribute to societal transformation outlined in the Reconstruction and Development Programme (RDP), with its compelling vision of people-driven development leading to the building of a better quality of life for all. These purposes are:

- To ensure that individuals have the opportunity to develop their abilities by allowing them the chance to study at a tertiary institution which will allow them to enhance their education and achieve equity amongst their fellow South Africans.

- To improve skills to ensure that the labour market has a continuous influx of qualified people, this will help in the growth of the economy of the country.

- To contribute to the socialisation of enlightened, responsible and constructively critical citizens. Higher education encourages students to express themselves by sharing ideas and committing to using those ideas to find solutions to everyday problems.

- To contribute in sharing knowledge. Higher education engages in the pursuit of helping students to achieve their goals through research and learning.

Jansen (2009:18) mentions the fact that the government has increased the amount of funding that is being made available to the students'. However this problem remains unresolved for students from the poorer areas. The students require the basics from transportation, accommodation and the necessary study material. This has placed a financial burden in government funding. Jansen (2009:18) encourages government to get together with various stakeholders to find a way to resolve this problem. Mokgalong

(2009:19) states that the campuses in the rural communities which are often the major centres need funding to help develop their potential and to enable the universities to achieve equivalence to their urban counter parts. Price (2009:26) suggests that in order for students to progress in their studies funding will be a key issue. The possibility of free education would allow more students to enter tertiary institutions. Free education would have the government pay the study fees of students who are able to meet their costs, while at the same time reducing capacity to assist those who can't afford to pay. The down side of which will be a huge cost to the state. Price (2009:26) mentions that a balance needs to be found for those who need free education and for those who can afford it.

2.5 TRANSFORMATION IN TERTIARY INSTITUTIONS

According to Higher Education South Africa (2009:5) Higher Education in the country post 1994 was subjected to policy changes and restructuring of the Higher Education (HE) landscape. Most of these changes were supported by universities in South Africa. These changes mainly affected the three main areas of HE endeavour:

• academic and enrolment planning;

• quality assurance;

• funding;

The implementation and development of these policies were successful due to the relationship between the HE sector and the Department of Education (now Higher Education and Training). Higher Education South Africa (2009:5) mentions that in 2002 the government launched a restructuring programme which saw a number of mergers (CPUT being one of the institutions) having positive outcomes. This would allow the universities to achieve greater equity in access, increased enrolments and increased research outputs. Higher Education South Africa (2009:5) states that even though changes have occurred challenges still remain of high student drop-out rates, low completion rates, particularly for African and Coloured students. The main challenge is the lack of preparedness of school leavers for HE study. Prof Jansen (2009:18) mentions that the transition from high school to university is a major problem. The only way to correct this would require a stronger relationship between schools and universities in preparing the student to enter tertiary education with the correct grounding. According to Jansen (2009:18) there is considerable evidence that school preparation is inadequate for most students as they pass their grade 12 but then

struggle in the first year at tertiary level. Jansen (2009:18) states that compensatory programmes are not enough to bridge the gap between high school and university. Universities should do better to accommodate students from disadvantaged backgrounds, the long – term solution is to improve the quality of learning at high school. This can only be achieved by government doing their bit to find solutions on how to strengthen the link between school and university.

2.5.1 Student under-preparedness and the gap between school and university

Fisher (2011:36) mentions that the quality of schooling has a huge impact on the success rates for black and white students in higher education and in Engineering. It would however be misleading to compare race with student under-preparedness. The fact of the matter is that black students from "good" formally white schools are doing well as opposed to the white students from "good" schools that are under prepared for university study. There are also good indications that some schools in the rural and disadvantaged communities are doing well. Fisher (2011:36) puts emphasis on the fact that not all is as it seems, that no matter the background or race of a student there is still a gap between the demands and expectations of school and university.CHE (2010:109) did a case study at the University of Pretoria, which provided critical information in regard to how a student was adapting to life at tertiary level. Students from all faculties were tested. The results revealed that the gap between the academic demands of high school and academic expectations of the university was quite significant. It must be noted that these claims were made from students who attended top schools and by students who attended rural schools. According to CHE (2010:109) the gap between university and school can be summed up into three main problems:

- The intensity of the work.

- The rapid progression from one set of concepts to another.

- The independence which is expected of students at university with respect to their own learning.

These problems that the student experiences could be the result of a weakness in the school curriculum and a decline in the standards of the final grade 12 examinations. A recent analysis has shown that the grade 12 examinations are not a good preparation tool for the students as they can pass grade 12 without the necessary subjects that are the main subjects given at university level. (Fisher 2011:36). Fisher (2011:37) has shown that the results from national bench mark tests have dropped to very low levels of the students' ability, especially in the mathematics field. The reliability of the National

Senior Certificate especially in 2008 had a large amount of students qualifying for university admission. However this led to a high failure rate for the first year university courses. According to CHE (2010:105) language and communication together with mathematics is well known to be one of the main challenges facing students. English is the preferred language used by lecturers as a teaching medium; this is seen as an obstacle for students from disadvantaged and second-language backgrounds.

2.5.2 Alternative Admissions, Foundation and Extended Programmes

Fisher (2011:67) mentions that the universities needed to make alternative admissions available in order to accommodate students. This was done by means of introducing bridging, foundation and extended curriculum programmes. Over the years these programmes have been modified in order for the student to be fully integrated into their main field of study. This would in most cases add on one more year to their Degree\Diploma. These programmes allow students the opportunity to complete their studies and graduate with the same qualification as a student that was on mainstream. According to Scott, Yeild & Hendry (2007:43) the use of Foundational provision has been put into place is to facilitate the academic development of students whose prior learning has been affected by educational or social inequalities.

2.5.3 Foundational Provision and an Extended Curriculum Programme

Scott et al. (2007:43) explains the differences between foundational provision and the extended programme. Foundational provision contains modules, courses or other curricular elements that are needed to help the students to have better academic foundations that will enable them to successfully complete a recognised higher education qualification. Foundational provision focuses mainly on basic concepts, content and learning approaches that help the student to have a better understanding of the subject. Even though the subject matter is at an introductory level, foundational provision must allow the students to experience the academic demands that are appropriate to higher education. The extended curriculum programme can be defined as is a first degree or diploma programme that incorporates substantial foundational provision that is additional to the coursework prescribed for the standard programme. The foundational provision incorporated must be the equivalent to one or two semesters of full time study. It must also be formally planned and must co-inside with the curriculum of the mainstream. Scott et al (2007: 45) point out that it is vitally important that the communication between the foundational courses and the standard courses regarding the curriculum is vitally important. It must also be noted that independent

learning and the ability to cope with the high demands and course loads should be built into the design of the extended curriculum. This would have a positive impact on student throughput rate.

2.6 CONCLUSION

The legacy of apartheid has had such a negative effect on our schooling system that the universities have had to make the necessary provisions in order for students to have the opportunity of entering tertiary education. The government has realised that there is a problem in this regard and policies together with the necessary funding has been put into place. The problem with students that no matter their backgrounds the standard of education is not of a good standard at present with the main problem being that the schools are not preparing the students for the transition from high school to tertiary. The government has put guidelines in place and entry criteria for universities to follow in order to increase the amount of student intake. With the introduction of the ECP it is helped previous disadvantaged students the opportunity of studying at a university and improving their circumstances. This can be looked upon as a positive as the country will gain more skills than in the past.

CHAPTER THREE:
PROJECT MANAGEMENT OVERVIEW ON THE IMPLEMENTATION AND DELIVERY OF THE ECP

3.1 INTRODUCTION

The following chapter will explain the approaches adopted for the delivery of the ECP. Emphasis will be placed on time, cost and quality which play an important role in the functioning of the ECP. Guidelines and implementation of the ECP will also be examined together with the various management techniques which could be utilised. The overall structure and challenges that occur in the ECP will be mentioned together with the role of the Head of Department (HOD).

3.2 PROJECT MANAGEMENT

Martin& Tate (2002:10-11) explain that project management provides a process that can be followed in a series of moves that will help address some basic questions, questions such as what is going to be produced? What is it the student needs? Who is going to do the work? How long will it take? How much will it cost? What might go wrong? How can potential problems be avoided? These questions are addressed up front so that the work can proceed smoothly and efficiently. In addition a project management method also helps to keep a project on track, solving problems as they arise. It helps to manage changes that might be required for the project. Finally project management helps to learn from what happened during the project so that better results can be created for the next year.

Burke (2007:18) states that project management is defined by PMBOK as the application of knowledge, skills, tools, and techniques to the ECPs activities in order to meet stakeholders' needs and expectations. In other words the HOD must do whatever is required to get the desired results. Mantel, Meredith, Shafer, & Sutton (2001:4) mention that project management differs greatly from general management. Unlike their general management counterparts, project managers (being the HOD) have responsibility for implementing the ECP, but little or no legitimate authority to command the required resources from the functional departments. The PM must be skilled at win-win negotiation to obtain these resources.

3.2.1 Concepts for quality time and cost

Wilson (2015:1) puts forward the following concept that it is vitally important that the HOD understands the overall scope of the ECP and must be able to understand the boundaries and challengers that may occur during the delivery of the course itself. In order for the concept to work the occurrence of the triple constraint being time, cost and quality must be monitored on a continuous basis as unnecessary additions that were not originally required to deliver the programme can increase costs and in-turn increase the time taken for the course to be completed.

There is no right or wrong way to approach the delivery of the ECP, however cost and time would play an important role as the student has been presented with a specific time frame on how long the course will take and the costs involved. Substitution Pty Ltd (2015:1) reminds us of the fact that 'time is the first priority and cost (budget) may be more important than quality.

3.2.2 Project management triangle

In any industry time, quality and cost play an important part in producing a product. Substitution Pty Ltd (2015:1) states that in running a project (being the ECP) the triangle of scope, time and cost which features prominently in project management should be followed closely.

There are three constraints in a project management triangle are time, cost and scope.

Figure 3.1: Project Management Triangle

(Tutorialspoint 2015:1)

3.2.3 Time

The delivery of the ECP has been pre-determined on the amount of time that is needed for a student to complete the course. Machika (2013:1) explains that it is the responsibility of the students entering the ECP that they should complete their subjects in the required minimum period. CPUT (2016:1) clearly states that the curriculum for the ECP students will take the first year and spread it over a two year period, after

which the students will be integrated into the mainstream. Schwalbe (2006:109) states that time management involves the processes required to ensure timely completion the course. The main planning performed as part of the project time management are activity definition, activity sequencing, activity resource estimating, activity duration, and estimating and schedule development. Field& Keller (2000:206) have put forward the idea that in most subjects the schedule will be governed to some extent by limitations on the availability of resources, including lecturers, classroom and lab availability, shared facilities and even the constraint of cash flow. If resources are finite it may be necessary to schedule activities not at their earliest date but at a time that makes best use of the available resources. The minimum time for completion has therefore been increased by one year which will give the opportunity for the students to be more assured of success. The ECP students generally graduate at the same time with the majority of their 'mainstream' counterparts who started off with a full academic load. The students write the same final examinations and receive the same qualification in all respects.

3.2.4 Cost

Garraway (2015:2) states that the students that are accepted onto the ECP are required to pay one and a half times more than the students who are on the mainstream. If the student fails a subject it will put strain on the resources available therefore increasing the costs. In order for the student to avoid incurring unnecessary costs they must be able to demonstrate that they have mastered the knowledge and skills that have been provided by the ECP which will enable the student to obtain the qualification within the required minimum period. Summers (2009:477) explains that costs need to be monitored during the delivery of a subject for many reasons. Technical difficulties may require more resources than originally planned. Pinkerton (2003:137) states that HODs are usually required to establish the cost of a course as part of an appropriations request. More important, perhaps, is that executive management approves the appropriation based on a documented projection that profits earned by the venture will exceed costs.

3.2.5 The relationship between time vs. quality in the classroom

In general there seems to be a misconception between time vs. quality the debate has always centred on whether the time taken will determine the quality of the end product. According to Petty (2014:1) lecturers who spend less time on admin and more time in the classroom will produce a better quality student. Petty (2014:1) mentions that the

more time that is taken to produce a higher quality student could lead to an increase in cost. It is well noted that time has a strong correlation with quality.

3.2.6 Total Quality Management

The definition of total quality management according to Ali & Shastri (2010:9) is a management philosophy with a set of guidelines which allow an institution to pursue quality with quality judged upon the improvement of the students and that the students themselves are happy in the services and environment that they find themselves in. Ali et al (2010:10) also states that doing things right the first time and fulfilling the students' needs is the responsibility of all involved in the institution.

According to Aina & Kayode (2012:25) TQM and teaching philosophy have been infused together to produce the following guidelines:

- "TQM in a classroom setting is a philosophy and a set of guiding principles and practices the teachers apply to teaching that represents the foundation for continuous learning and improvement on the part of the students and the teachers. It is the application of procedures related to instruction that improves the quality of education provided to the students and the degree to which the needs of the students and their employers are met, now and in the future.

- TQM in the classroom setting is a process that involves the teacher's adopting a total quality approach to teaching (i.e. attempting to improve the quality of instruction and in the process, the students' meaningful learning in every possible way) so that the needs of the students and those of their employers are best served. It is the never ending pursuit of continuous improvement in the quality of education provided to the students."

Hashmi (2016:1) mentions that a clear commitment must be shown in improving the quality of educating the students. Together with TQM and teaching philosophy the HOD also needs to implement the following concepts.

- To continuously communicate the quality message to the lecturers, students' parents and the community in which the institution is based.

- To ensure that the students expectations are met in regard to the institutions policies and practices.

- It is important that staff be developed and trained in new concepts that can improve their teaching abilities.

- To build effective teams.

- To deal with problems that may arise whether it from a managerial policies or culture of the institution.

- To have a process in place to ensure communication, motivation of staff and monitoring of students' progress to allow the immediate solving of problems should they arise.

Hussain (2011:39) mentions that by having TQM in place in the administration department can improve the throughput of the students. It is important at all times that communication between departments is kept open at all times. This will allow the departments to be fully functional as students will be registered and on the system, which will give lectures the knowledge of how many students to cater for.

3.2.7 Application of TQM to effective teaching and learning in the classroom

The figure below explains the simple concept of what the lecturer is trying to achieve in the classroom

Figure3.2: Teacher – Student interaction model
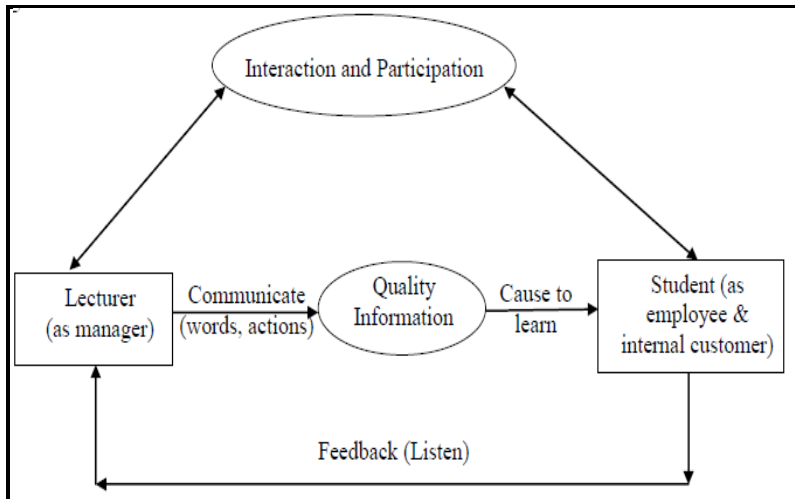
Source: Aina *et al* (2012:26)

According to Aina *et al* (2012:27) building quality relationships among lecturers, students and course material will help in the learning environment. With these factors in place it will inevitably help in the delivery of the content allowing for effective learning to happen. Aina *et a*l (2012:27) reminds us that the Teacher – Student Interaction Model clearly shows that every student involved in the learning process is being attentive in the classroom and meeting their learning requirements, by this happening they gain satisfaction from their educational experience. This total commitment involves the lecturers to invest time and energy and requires that they be "professionally responsible and accountable for developing the students in a total quality environment." Aina *et al* (2012:25) mentions that total quality must not be forgotten when issuing books, course

notes and the general delivery of a lecture. These factors are the main sources of delivering a good quality of education.

According to Tutorialspoint (2015:1) quality is not a part of the project management triangle, but it is the ultimate objective of every delivery. Many HODs are under the notion that 'high quality comes with high cost', which to some extent is true. By using low quality resources in the ECP does not ensure success of the students. Quality Digest (2015:1) states that the definition of quality is as follows: "Quality is the ongoing process of building and sustaining relationships by assessing, anticipating, and fulfilling stated and implied needs." This statement is quite significant as the needs of the students and the time allocated to meet those needs will ultimately determine what quality of student that will be produced at the end.

According to Burke (2007:255) quality is a frequently misused term. One must be careful not to confuse quality with the overall performance of a student. It should be judged on the overall outcomes and whether a student has met expectations. Venkataraman & Pinto (2008:238) mention that the delivery of a subject must meet the quality standards which are outlined in the institutions deliverables, therefore giving the students the opportunity to succeed. Quality and scope are the basic fundamentals in providing a good outcome, as without a structure the quality and the scope of the ECP could be affected in a way which will have a negative impact on the objectives.

3.3 SCOPE
Scope looks at the outcomes and results that have been achieved by the students. This consists of a list of deliverables, which needs to be addressed by the HOD and the lecturers. A successful HOD will know how to manage both the scope of the ECP and any change in scope which impacts time and cost.

3.4 GUIDELINES FOR THE ECP TO BE IMPLEMENTED
Stewart (2008:1) states that the definition of a deliverable is a long term plan of action designed to achieve a particular goal or set of objectives. Without a guideline on what needs to be achieved the plan of action will not have the desired outcome. This is achieved by giving the students a subject guide which will give the necessary objectives and goals that need to be achieved by the end of the year. The planning for subject

guide is done with the knowledge that the necessary resources will be available to complete the course.

Stewart (2008**:**1) further states that the strategy in place needs to be analysed on a regular basis as circumstances may affect its delivery. This can be done effectively with the use of SWOT analysis. Therefore a good strategy will give the institution a better competitive advantage as a roadmap is in place.

3.4.1 Overcoming challenges to ensure that the ideals of the ECP are implemented

According to Tutorials point Simple Easy Learning (2014:1) it is very important to overcome obstacles that might present itself during the implementation of a project which takes the form of the ECP. The Head of Department (HOD) needs to understand that the three constraints being time, quality and cost can be adjusted where necessary. In order for the ECP to be successful the HOD needs to implement the following:

- The HOD needs to define what is required from his\her staff and split the tasks amongst team members.

- The HOD must have easy access to obtain key resources and build teamwork.

- The HOD needs to set the objectives required for the project and work towards meeting these objectives.

- The most important activity of a project manager is to keep stakeholders (mainly the Department of Higher Education) informed on the progress of the project.

3.4.2 Prerequisites for implementation

Summers (2009:43-44) mentions that according to Crosby (2009:17) a successful student is one who receives a product or service that meets his or her expectations the first time. Crosby's message to management emphasizes four prerequisites. The four prerequisites of quality management set expectations for a continuous improvement process to meet.

The first prerequisite defines quality as conformance to requirements. The student requirements must translate to measurable characteristics for the institutions products or services. Crosby (2009:17) emphasized that effective institutions understand the importance of determining student requirements, as clearly as possible and then produce products or providing services that conform to the requirements, as established by the student.

Tinnirello (2002:175) states that once a quality policy is put in place; the second major issue is monitoring the students to ensure that the policy is carried out. This means that the institution managers must establish a good quality management function that provides their institutions with good information about the quality of their students under development, and enforce their quality policies. The policies and their enforcement have failed, if the institutions' manager ascertains that the stakeholders are dissatisfied with the quality of student that has been produced.

Summers (2009:43-44) describes the prevention of defects as the second prerequisite, to ensure that the products or services provided by the tertiary institution meet the requirements of the student. Prevention of quality problems is much more cost effective in the long term. Determining the root cause of defects and preventing their recurrence are integral to effective systems. Crosby (2009:17) also states that the performance standard against which any system must be judged is zero defects, which is the third prerequisite. Zero defects refer to teaching the students correctly the first time, with no imperfections. Traditional quality control centred on final inspection and "acceptable" defect levels. Effective tertiary institutions must establish or improve systems that allow the lecturer to do it right the first time. The Fourth prerequisite is the cost of quality which refers to the costs associated with providing the students with a product or service that conforms to their expectations. Quality costs are found in the costs associated with unhappy students, downtime, material costs and the costs involved anytime a resource has been wasted in the production of a quality student. In determining costs of quality, it can be used by effective institutions to justify investments in equipment and processes that reduce the likelihood of defects.

3.4.3 Factors that influence the delivery of the ECP

According to Venkataraman et al (2008:235) in terms of enhancing value in the delivery of the ECP, cost, time and quality are the three criteria. However the term "quality" can mean different things to different people and there is no single definition that is universally applicable.

According to Abdelsalam & Gad (2009:14) the competitive pressures facing tertiary institutions in today's environment have led to increasing reliance on quality-oriented, results-based improvements. As a way of meeting the challenges they're facing today, institutions throughout the world have made quality a priority in the form of total quality management (TQM), continuous improvement (CI), and similar initiatives. The

institutions ability to measure costs related to quality has, thus, become a necessity; ''unless it can become measurable, it cannot be manageable ''

Venkataraman *et al* (2008:238) further state that the key features that define the ECPs success are twofold; managing costs to achieve efficiencies and creating and enhancing value. The two elements enable the stakeholders to understand the activities and resources required to meet the ECPs goals, as well as the expenditures necessary to deliver the programme to the satisfaction of the student. This is where quality and time start becoming a reality. Venkataraman *et al* (2008:239) also emphasize the fact that in terms of enhancing value in delivering the ECP, costs, time, and quality are the three key criteria.

The ultimate quality of the student begins with the quality of the design. It should be noted that a poor initial design can create considerable problems during the students development phase including difficulty in acquiring required materials or inability to meet specifications or follow procedures. Ultimately, poor quality of design will result in the programme costing more which will affect the implementation thereof.

3.5 CONCLUSION

Project management plays a significant role in the delivery of the ECP. Time, cost and quality are the three main areas which determine the success or failure of the delivery of the ECP. It can be seen that the more time spent in the classroom will increase costs, however the chances of developing a better quality student is much greater. Factors and problems with the students overall performance needs to be taken into consideration in order to ensure that the student obtains the necessary skills to move forward.

CHAPTER FOUR:
RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

The development of science has resulted in the understanding of procedures, processes and methods that need to be followed to have credible research. Over the years it has become apparent that the research process involves two closely interrelated activities, too often wrongly used interchangeably. These are the research design and the research methodology; these two follow each other in that order. Research design is the pathway and activities stipulated for the research, clearly determining what is to be done (Jowah, 2015:77). The Business Dictionary (2015) refers to the design as a "detailed outline of what will be done in the research. This is contrary to the research methodology which is essentially how the research design activities will be conducted. The two follow each other in this order.

4.1.1 The research design; This makes reference to what should be done, in this research there are specific activities to be followed in order to make the research findings to have reliability and validity. The design starts with deciding on the first step necessary for the research. The map or pathway to be followed involves, what is to be researched, what the objectives of the research are, what the research question is, what population (objects) are to be research, what type of sample is required, what the sampling method will be, what the sample size will be, what type of research it would be, what type of instrument (if any) will be used, what research methods are to be used, what data collection methods, and what data analysis methods will be used.

4.1.2 The research methodology; Research methodology on the other hand focuses on how these research design activities will be conducted, thus; how will the research subject and objectives be decided on, how will the research question be constructed, how will the research population be identified, how will the sample be selected, how will the population be sampled, how will the data be collected, how will the research instrument be developed, how will the data collection be conducted, how will the collected data be analysed, and how will it be reported. Thus the methodology is in answer to the "how" of the research when the design is for the "what" of the research.

4.1.3 Differentiating design from methodology

There is a clear distinction between these two concepts as discussed above, they can be considered merely as closely related. Jowah (2015:18A clearly separates these two concepts as illustrated in table 4.1 below. The researcher defines the Research Methodology as an explanation on how the techniques identified in the research design will be used or implemented (Babbie and Mouton, 2001:55). Whatever things have to be done, the methodology explains how they will be done since there will be more than one method of executing the tasks.

Table 4.1: Differentiating the research design from the research methodology

RESEARCH DESIGN	RESEARCH METHODOLOGY
Strategic master plan	Operational or execution plan
Emphasizes the road to be walked	Emphasizes how the walking is done
Emphasis on what results are expected	Emphasis on tools/techniques for results
Guided by research problem / question	Guided by the tasks and work packages
Focuses on rationality of research	Focuses on procedures and processes
Focuses on the "what should be done?"	Focuses on "how should it be done?"

Source: Jowah, 2014:77

The author states that the research methodology is "derived from the stipulates of the research design," meaning therefore that the methodology is the next step after setting up the design. The methodology is the design in operation. The design and the methodology together will comprise of the population, sampling, sample size, data collection, data analysis, and the reporting. The strategy of the research, the results expected, and the rationality of the research are all characteristics of the design. How to walk the road to the expected results using the tools provided by the design explains the research methodology.

4.1.4 Types of Research Methodologies

There are two types of research methodologies listed in literature on research, and these are quantitative and qualitative research methods. These two differ in many respects but appear to complement each other in certain types of research. The major differences are tabled in illustration (table 4.2) below, there are marked differences between these two.

Table 4.2: Differentiating quantitative from qualitative research

Quantitative [positivist approach]	Qualitative [anti-positivist]
1.focus on observable behaviour	1.focus on laws of relationships
2.focus on universal relationship laws	2.focus on human experience

3.focus on causes of phenomenon	3.focus on experience of phenomena
4.uses the natural science model	4.uses the experiential model
5.is aided by firm checks and balances	5.does not have firm checks and balances
6.emphasis measurement and analysis	6.emphasise investigating processes
7. have natural science built structures	7.have socially built nature of reality
8.focus on causal relationships and variables	8.focus on object relationship with researcher
9. ideal for objective data with numbers	9.uses subjective data from opinions
10. uses rigidly structured methods	10. uses flexible exploratory methods
11.tries to understand from outside	11.tries to be involved with subjects
12. needs a static environment	12 work with non-static realities
13. uses of particularistic approach	13. uses holistic [wide data] approach
14. uses large samples	14.uses small samples

Source: Jowah, 2015: 103

The researcher has opted to use both methodologies to take advantage of the positive attributes of each methodology to assist in bringing up the expected results. Since the research process is used to collect and analyse data to provide better understanding of the study (Creswell, 2008:18), using both methods will simply benefit the research. Burns & Grove (2005:23) define quantitative research as a formal, objective, systematic process where data (numerical) is collected and interpreted to convey meaning about a study. Qualitative research is defined as an inquiry seeking to understand the personal meanings of individual experiences in the context of the subject's environment and realities. To take advantage of this wealth of knowledge, the two methods (mixed methods) have been adopted for the research.

4.2 TARGET POPULATION

The research was focused on the lecturing staff in the department as they interact, lecture, consult, set exams, mark the exams and upload the marks for the students. These lecturers are expected to have full first hand understanding of all the learning difficulties experienced by the ECP students. They understand better the quality of the ECP students compared to the mainstream students.

4.2.1 Sample frame

The sample frame is the total number of objects that could be interviewed, that qualified for the survey. The department has 19 lecturers all of whom directly interact with the ECP students, albeit at different levels of the diploma and degree. Some lecturers meet these students at entry level and prepare them for senior classes where other lecturers take charge (mixed groups).

4.2.2 Sampling method

The researcher decided to use or to survey all the lecturers (the sample frame) since there were no negative costs and time implications. Sampling is done primarily because it is generally expensive to go through the whole population (census), in this study all the respondents are in one department. No sampling was done; all the lecturers were involved in the survey.

4.2.3 Sample size

As stated above, all the lecturers were involved and no sampling was done, this enabled a full census to provide information for this assessment as it were.

4.3 THE RESEARCH INSTRUMENT

It was necessary to decide on how to gather data required for this research, the researcher therefore opted to use a questionnaire. Jowah (2015:163) defines a questionnaire as a set of questions logically constructed with the aim of derived from the respondents data that will help from answers to reach the objectives. The instrument used in this research was a structured questionnaire with semi-structured questions (qualitative) questions in between. The questionnaire was divided into three (3) sections, namely Section A, Section B, and Section C.

Section A was biography – this was used to get details about the respondents and somewhat qualify them to take part in the survey. Those who did not meet the expected requirements were excluded (two questionnaires of the respondents were disqualified), and only the relevant respondents had their questionnaires included in the findings.

Section B was the Likert scale – this scale measured the perceptions, experiences and understanding of the respondents in relation to the assessments of the performance of the ECP students. The scale measured 1-5 with Highly disagree = 1. Disagree = 2, Neutral = 3, Agree = 4 and Highly agree = 5. A small section at the bottom of the scale requested for any other information necessary, providing space for 5 points to be made.

Section C was open ended – allowing for the respondents to discuss any other issues, experiences or matters deemed important. In this section the respondents had an opportunity to air their views on any matter to do with the ECP students, issues, problems and any other factors.

The questionnaire was considered handy since data could be gathered under anonymous and confidential circumstances and be kept for future use. This data could therefore be converted to information and could be revisited at will should other questions arise pertaining to the research. The three page questionnaire allowed for wider participation and provided opportunity for to express views about the matter at hand without fear for reprisals. The use of the questionnaire also allowed for the targeting of a wider audience as compared to having a few interviews. After construction, the questionnaire was taken for a "pre-run" and reconstructed with the assistance of the statistician, after which was sent for ethics clearance. After this, it was then used to collect the data from the respondents.

4.3.1 Advantages of using the questionnaire method

The questionnaire was decided on because of certain advantages that would assist positively in the survey of this nature. Using the findings from the University of Portsmouth (2012:1), it was decided that these advantages, listed below justified the use of questionnaires. These are;

- "Large number of respondents possible.
- Representative sample possible.
- Question responses can be highly structured and easily coded.
- Statistical tests possible (depending on nature of data collected).
- Respondent has time to consider questions (especially so as it is not face to face).
- Inexpensive was to cover a large geographical area.
- Questionnaires are replicable and can be used in later studies and if well-constructed and properly piloted they should be reliable.
- Standardised questionnaires have already been validated; you can compare your work directly to other studies."

4.3.2 The disadvantages of using a questionnaire

Though the questionnaire has its positive uses which assisted in the collection of the required data, it was necessary to access the negative impact of using the questionnaire. These were identified as;

- "If not administered face to face (for example by email attachment or on-line) there is a possibility of a low response rate (not getting many questionnaires back).

- No way of knowing how representative people are in some website/internet-based surveys (that is, it depends on whether people can access a website.)

- Questions cannot be explained to respondents and can be misinterpreted (unless administered face-to-face) and answers cannot be put in any real world context.

- Questionnaires cannot tell us about context and meaning behind a response.

- Likelihood of socially desirable responses to certain questions"

These disadvantages were weighed against the positives, and considering that the researcher conducted the research face to face, the questionnaires were the most appropriate. And because there was a section with open ended questions, it was possible to interact directly with the respondents and thereby reduce a low response rate, as well as remove any ambiguity in the questions.

4.3.3 The reliability and the validity of the questionnaire
Reliability is the guarantee that the same questionnaire used by different people would convey the same information thereby creating a standard answer (Kobus, 2016:238). To achieve that, the questionnaire was subjected to different reliability tests, namely;
- Test-retest reliability
- Equivalent form reliability,
- Split-halves reliability, and
- Internal reliability

With the assistance of the statistician the questionnaire was also tested for validity by subjecting it through the four common tests for validity, namely

- Face validity,
- Content validity,
- Construct validity, and
- Construct validity,
- Criterion validity

Testing for both was important in that an unreliable questionnaire cannot be valid and vice versa. Many items were formulated in seeming contradiction to each other and there were no questions requiring a no or yes answer to avoid allowing the respondents two choices only. The language was made simple, short and easy to understand

specifically since all the lecturers in the department use English as a second language. This tremendously reduced the possibility of being misunderstood which may have resulted in unintentional wrong answers. This thus improved both the reliability and validity of the research instrument.

4.4 DATA COLLECTION TECHNIQUE

Collection the data was through the use of the structured questionnaire, each one of the lecturers was given to respond to the questions. Because there was ample time, the respondents were free to ask questions or request for clarity from the researcher since the researcher personally administered the questionnaires. All areas that needed explanation were addressed and the questionnaires were collected at the end of the exercise, giving a 100% return rate on the questionnaires. The open ended sections of the questionnaire attracted more discussion (questions) with the respondents thereby allowing them to fill in what they thought. This was the qualitative aspect of the questionnaire in line with the decision to use the mixed methods approach for the survey.

4.5 DATA ANALYSIS

After collection, the data was cleaned and edited for any errors and omissions were identified, the questions were coded and the information was captured on to an Excel Spread Sheet. This data was then converted to illustrations in the form of tables, pie charts, histograms, frequency polygons, bar charts, etc. These showed the relationships between the variables under study on the basis of which the interpretation and analysis of the findings was based. This analysed data is therefore converted to information on the basis on which generalisations may be made on the research findings. The data chapter following is therefore a result of these findings and generalisations, from which conclusions and recommendations are derived.

4.6 ETHICAL CONSIDERATIONS

Ethics was treated as an important element of this research in view of government expectation and the subsequent university policy on ethics. This was meant specifically so that no individual would be harmed both physically or emotionally. According to Trochim (2006:1), there are six main ethical considerations to be observed, namely;

- Voluntary participation the participants at no time should be forced into taking part in the research.

- Informed consent. It is imperative that the participants get a letter before participating which gives them the opportunity to say no if they wish to do so.

- Risk of harm. Ethical standards clearly state that the researcher must at no given time put the participant in danger while conducting their research.

- Confidentiality of information gathered needs to be taken into consideration and must be respected at all times.

- Anonymity guarantees the right to privacy to the participants especially if it could mean that their views on a certain subject could cause problems in the workplace which could lead to job loss as an example.

- Right to service. The participants have the right to benefit from any research that might incur a positive outcome. This would most certainly in most cases be an improvement of the conditions that they find themselves in.

These principles were adhered to and all participants were informed of their rights before the interviews started. True to the commitment assured to the respondents, no information of a personal nature was released to any authority, and the confidentiality was observed to date.

4.7 LIMITATIONS OF THE RESEARCH

In as much as the research was handled with care and objectivity being at the centre of the activities in the research process, the research has its own limitations. Whilst these could have been averted, it was important to accept the realities of the availability of other factors, cost of covering more respondents outside of the current case study. The limitations observed are, namely;

- The study only focused on one tertiary institution which might give results that could be seen as unbalanced

- There are other institutions that have the same programmes (albeit administered differently) and may be allocating resources differently and getting different results.

- Time, costs and getting permission were factors that constrained the researcher from covering more institutions in the country.

- The participants might not have taken the study as a critical analysis of the university and government endeavours to address a perennial problem in the country.

- The questionnaire being in English might have resulted in the misinterpretation of the questions as for the most part English is the second language of the participants.

However despite the limitations, the research was objectively carried out and the processes clearly outlined and followed scientifically. The results are expected therefore to be objective and any other researcher using the same methodology may come to the same findings as recorded in coming chapters.

4.8 CONCLUSION

The validity and reliability of this research project should be understood in the context of work done objectively with the design being followed meticulously. Starting with the introduction of this study, the background literature reviewed, establishment of the study gap and subsequent understanding of the problem statement, the setting of the objectives, the research questions, the decision on the mixed methods, identification of the population, the construction and testing of the questionnaire, data collection methods and data analysis. It is hoped that this approach provides the solution or clarity on the situation with ECP students in relation to the quality of their learning.

CHAPTER FIVE:
DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF RESEARCH FINDINGS

5.1 INTRODUCTION

In this chapter the data collected was converted to easy to read and compare illustrations that represent the relationships between the variables under study. The illustrations used are the charts (pie charts and bar charts), graphs, tables, histograms and other forms of diagrammatically representing the relationships between the variables. The aim of the study was primarily to evaluate the effectiveness of the ECP as a useful tool used by the government (adopted by the university) to assist in "retrieving" matric learners who would have been lost as none competent engineers. Lecturers at various stages in the engineering course of the study were interviewed since they are involved in the ECP students at the different levels. As alluded to before, the questionnaire was adopted as a data gathering instrument relevant for the purpose. This instrument was structured with the assistance of both the supervisor and the statistician to make it more relevant, reliable and valid for the survey. Thus, prior to the survey, the questionnaire was sent to a few individuals to test and assist with improving the relevance and validity, corrections were made thereby making valid the instrument – questionnaire. The questionnaires were duly filled in and they were cleaned, edited and coded, the data was constructed into graphs, tables and charts. The final instrument used was divided into three (3) sections, Section A was the Biography, Section B was the content – focused on the communication problems, and Section C was open-ended questions meant to facilitate the qualitative aspect of the research. Section C is of particular interest because it is open ended, and the respondents would be able to cover all the aspects that might have been omitted by the research instrument.

5.2 REPORTING OF THE RESULTS

The collected data was cleaned, edited, coded and captured on to a Microsoft Excel Software Spreadsheet for analysis. This software was chosen because it is a user friendly and helpful software programme in the conversion of data into illustrated graphs, charts and tables. These representations were subsequently used to interpret and store the data and the information. Most of the data was converted into graphs and tables because their coherence and readability for the purposes of comparing the variables under study with easy to understand illustrations. The

reporting format was deliberately designed to allow maximum expose to every question or statement used in the data gathering process. To enable this, all the questions (one by one) and, or the statements in the Likert scale (ranked) as constructed into the questionnaire have been repeated and each is followed by the response which includes the illustrations coming from the analysis of the collected data. Thus every item is presented thus;

Question or statement;

Response;

This format is followed for the questions in the Section A- Biography section, Section B – The Likert Scale and the Section C – Open-ended questions.

SECTION A. BIOGRAPHY

The focus of this section was essentially to qualify the respondents through collection of biographical data. Although the population understudy had already been separated through stratification, it was still necessary to confirm the credentials of those in the target population. The questions asked in this section dealt primarily with information on or about the respondents who themselves are involved in the facilitation in the programme. The questions were structured and closed (meaning they required specific answers) making it easy to quantify the findings and interpret these fairly easily. As stated already the biography essentially determined or evaluated the suitability of the candidates involved. The questions are asked according to their order in the questionnaire followed by the feedback from the respondents.

QUESTION 1   What is your position in the organisation?
RESPONSE: This question was intended to understand the position of the respondents in the department as it relates to the study. It was expected that there may be other people working in the department (administrators as an example) whose functions may not be of direct assistance as they do not interact nor evaluate the ECP candidates in the system. The makeup of which would determine the amount of respondents that are involved in lecturing the ECP cohort in the system. The biography assisted in identifying those that qualified to participate in the research, the response is shown in the figure 5.1 below.

Figure 5.1 The positions of the respondents
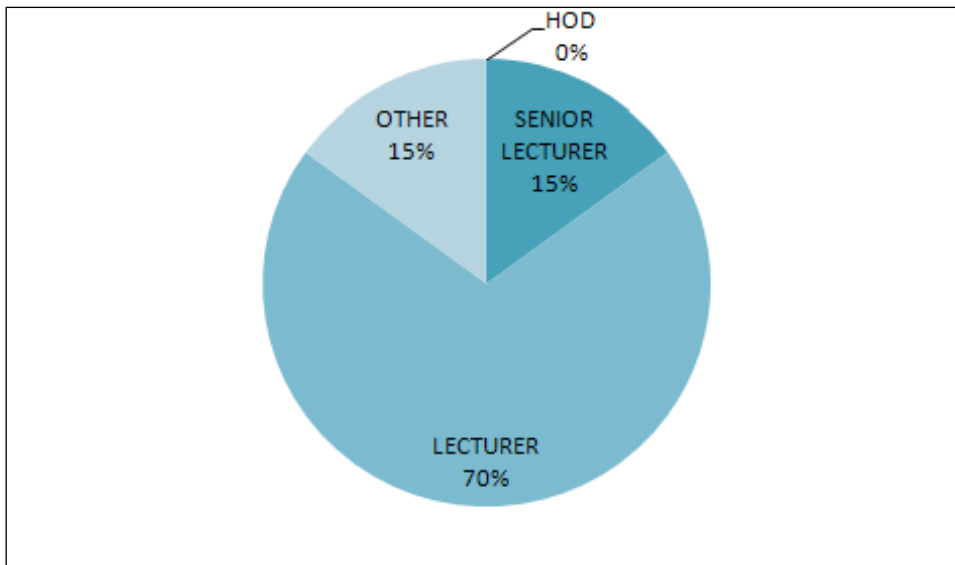
Source: own construction from survey

The majority of the respondents identified themselves as lecturers at 70%, the remaining 30% was equally divided between the senior lecturers (15%) whose function is actually lecturing and will therefore interact or lecture to these students at certain levels in the diploma programme. This gives a total of 85% of the respondents as being directly involved with the ECP students in the system. The remainder of 15% comprises of other members of staff other than those that teach the students in the classrooms. No HOD took part in the survey.

QUESTION 2 Are you involved in ECP lecturing?

RESPONSE: According to the structure; departments in the university have employed lecturers considered to be specifically for ECP students. This distinction is clearly demarcated at entry level (when the students are admitted into the ECP and not mainstream), when the ECP students attend class on their own and cover a somewhat slightly different curriculum. The ECP students get eventually merged into the mainstream as the students advance into the diploma. This question was intended to determine the number of those lecturers dealing (knowingly) with ECP students as a designated group. Figure 5.2 below shows the response from the research participants.

Figure 5.2 Respondents directly connected to ECP students.
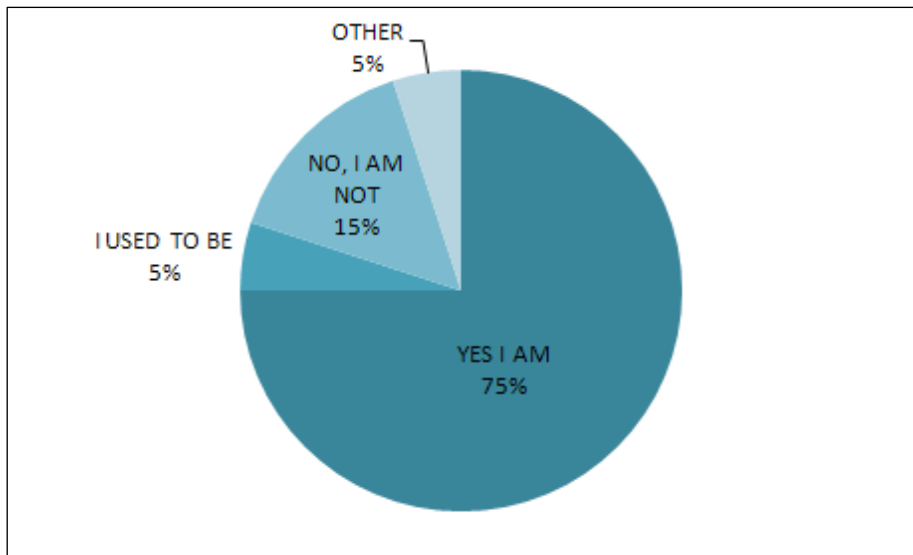
Source: own construction from survey

The research findings indicate that the majority of the respondents (75%) admitted that they were directly involved with the ECP students in the classroom. Consistency is shown with findings from figure 5.1 where the people who are involved are nearly as many as the number of lecturers (70% and 75%). 5% of the respondents indicated that they used to, it is not clear here if they had stopped lecturing, or if they made reference to the fact that they may had been moved from the ECP section in the department. At whatever level lecturers who go to the classroom always come across ECP candidates along the way up the ladder.

QUESTION 3 If other please specify

RESPONSE: Under those who responded to other in the questions, the rest never specified and one individual indicated that they were involved with the B. Tech Design. B. Tech Design is the post graduate qualification after the diploma, the department of which was not indicated in the response.

QUESTION 4 How long have you been involved in ECP projects?

RESPONSE: The ECP project was first introduced in the university twelve years ago and has been running ever since. The program has seen six streams of graduates (National Diploma); this period is long enough to have produced the results. For this reason it is appropriate that an evaluation be made – hence the question on how long the respondents have been in the system. This question was to determine whether or not the respondents were involved in ECP projects and the amount of reliable that

would come from them. Figure 5.3 below shows the respondents' time with the ECP project.

Figure 5.3 Years of respondents' exposure with the ECP project
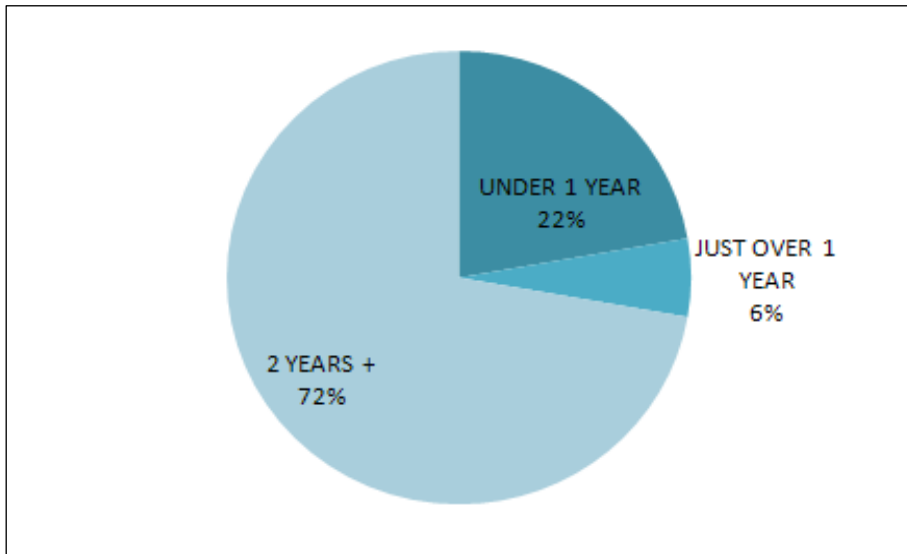
Source: own construction from survey

It appears that the majority of the participants have been with this program for 2 years and more (72%). This is promising in that there is a wealth of experience around which may assist in providing more accurate information. The remainder of the 28% respondents ranges from 6% (just over 1 year) and 22% (under 1 year) possibly new recruits, which may mean either a 22% labour turnover which is now replaced, or a growth by the introduction of new personnel. The majority of respondents have the necessary information required for the research.

QUESTION 5 Do you lecture any other classes / levels in your subject?

RESPONSE: Lecturers are generally subject specialists, thus in the cases where one subject is offered at different levels, a lecturer may offer the subject to different levels in the same year. Alternatively, a lecturer may have two different (or more) subjects offered at different levels. This question was used to determine how many of the respondents lecture on the mainstream and on the ECP or both. This would also give a good indication on how the respondents would give their opinions regarding the ECP within the stream as they mingle with mainstream students. The findings are recorded in Figure 5.4 below.

Figure 5.4 Extent of subject distribution among the lecturers
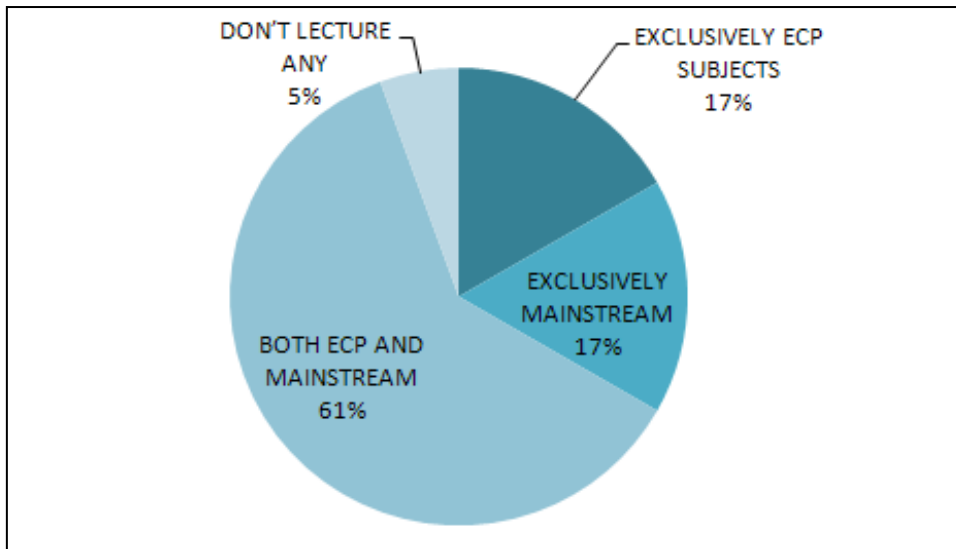
Source: own construction from research

Of particular interest was the fact that 61% of the respondents (still in the majority) were exposed to both ECP and mainstream lecturing. Whilst there is a 17% exclusively mainstream, they still lecture to the ECP students along the way towards the completion of the diploma or degree. There is also an exclusively ECP 17% possibly responsible for the entry level ECP before the students start crossing over and learning together with the mainstream candidates.

QUESTION 6 Anything you would want to say about lecturing in the ECPs, please state below:

RESPONSE: This question was designed to allow respondents to put forward their opinions about how lecturing to the ECP students could be improved. It was also anticipated that the respondents would add on some other information which may be important but omitted in the study. Of particular interest was the information supplied under this section, which was not exactly relevant and yet the respondents stated this. Table 5.1 below illustrates – lists the opinions of the respondents in regard to certain aspects of the ECP programme not necessarily covered in the preceding questions posed to the different respondents. Table 5.1 below lists the opinions added on under the open-ended part of section A – the biography.

Table 5.1 Respondents' opinions on the subject

More practicals	There is need for more time and opportunities for the students to do practicals in the laboratories for them to understand
Time explaining	More time is spent explaining some of the concepts to enable the students to grasp the knowledge and information required of them
Time to complete	There is always ample time for the lecturers to complete the work and we should avoid rushing the students through the syllabus
Repeating	Continuously going back to the difficult sections of the syllabus makes it possible for the students to grasp the subjects well
Industry visits	There is enough time to take students on industrial visits, and these should be planned to allow for frequent visits to give exposure
Good foundation	Industry visits give the students a good foundation that will help in their future studies as they can related theory to practical work

Source: own construction from data analysed from survey

The respondents felt generally that though there was this thought about ECP students as being "not well prepared" for tertiary education, these students adjusted fairly well. It was unanimously agreed on that patience with these students would bring them to the same level with all other students, and sometimes excelling beyond the mainstream students.

SECTION B – the Likert scale section.

The Likert scale is used in this section to measure respondent perception by ranking the statements in the questionnaire. The first part of the section focused on the knowledge about student calibre, and using the Likert scale the respondents had to indicate their perceptions about the flow of the information. The following scale: 1=Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 5 = Strongly Disagree was used.

STATEMENTS 1-5; KNOWLEDGE ABOUT THE CALIBER OF THE STUDENTS

The first part of this section (Likert scale) focused on the respondents' perceptions about the type of student they were dealing with in the ECP project. The same format of statement followed by the response is maintained as applied in the section above.

STATEMENT 1, All the ECP students in my classes are black students

RESPONSE; The original reasons for developing the ECP was primarily because it was believed that most matric failures or poor performance in mathematics and sciences was from poor and rural schools. These schools are characterized by the

absence of facilities, lack of qualified teachers and the absence of other necessary resources needed to improve on the learning. Generally, it is almost exclusively black schools that fit into that category; hence the question as it was expected that learners from better resourced locations would qualify for university directly. The statement sought to establish that fact, and the responses to this are reported in figure 5.5 below.

Figure 5.5 The demographics of ECP students
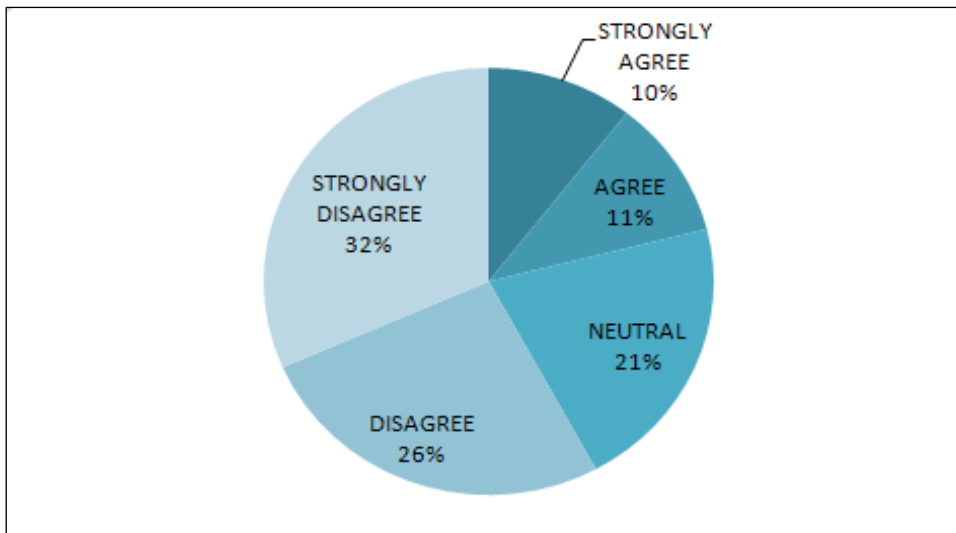
Source: own construction from data analysed from survey

A total of 58% (32% strongly disagreed and 26% disagreed) indicated that it was not correct that the ECP classes were exclusively black. Those deciding not to take sides were at 21%, an uncomfortable score for neutrality since these respondents know the classroom situation. The remainder of 21% total agreed with the statement suggesting that the ECP is exclusively black. It can be generalized however based on the 58% that there are other races in the ECP group apart from black students.

STATEMENT 2 There are more coloureds than whites [students] in the ECP

RESPONSE: Cape Town has a demography showing that coloureds comprise of 47% of the population. The city statistics shows that the racial ratio is 1:12:26:31 (Indian: white: black: coloured) respectively. The assumption hereby made leading to this statement is that since there are $2^1/_2$ times more coloureds than whites, the likelihood would be that more coloureds would join the ECP. Results can be seen in figure 5.6 below.

Figure 5.6 Ratio of coloured to white students in ECP
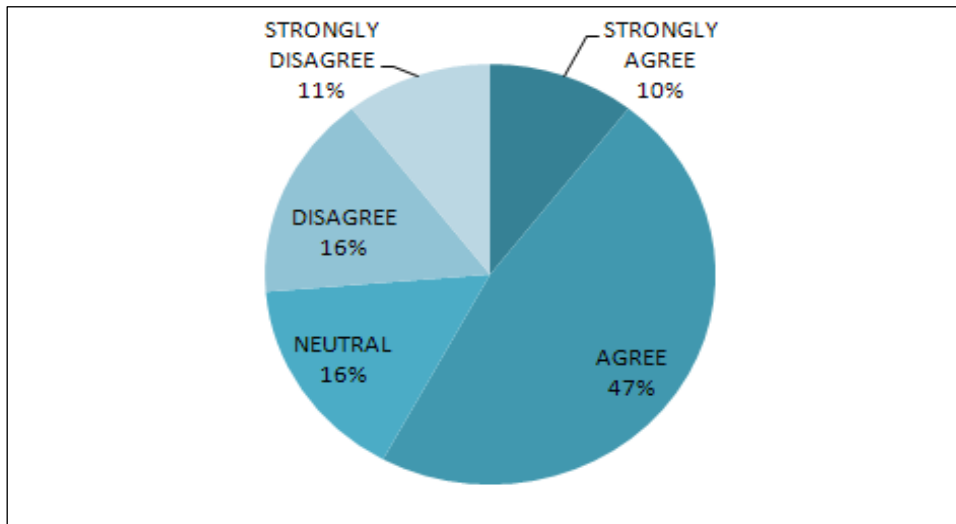
Source: own construction from researched data

As expected, the findings indicate that a total of 57% of the respondents (10% strongly agreed and 47% agreed) that there are more coloured students than white students in the programme. Neutral went down to 16% from the previous 21% in figure 5.5 .Only 27% (combined) disagreed with the assertion. It can be generalized that there are less white students needing the ECP facilities than there are coloured students. Because the Western Cape is predominantly coloured, but has the highest concentration of whites in the country, this why the statement was made.

STATEMENT 3 There are more females than males [students] in the ECP

RESPONSE: According to statistics there are 48.2% males and 51.1% females in South Africa's population, with the Western Cape having a ratio of 48.9% male and 51.1% female. The ratio is almost equal therefore suggesting that the class should have an equal amount of males and females' Admittedly a sizeable number of teenage girls fall out due in pregnancies in the last two years of their high school education. Nevertheless, there is still a high percentage of girls making it into university. The response is in figure 5.7 below.

Figure 5.7 Ratio of male to female students
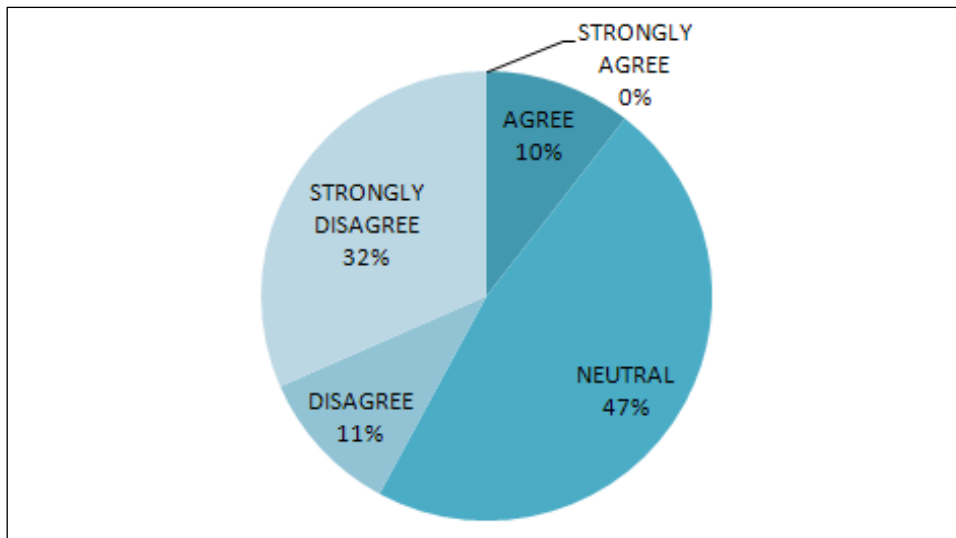
Source: own construction from researched data

The above figure (5.7) indicates that 47% of respondents remained neutral or were not sure if the gender distribution in class. This may be interpreted to mean that the number of male and female (students) may be so close it would be difficult to know without counting. Only 10% agreed with the statement with 43% disagreeing with the assertion. It is difficult however to use these results as a proper indication of the state of the classroom since there is an extremely high number of those showing uncertainty.

STATEMENT 4: The ECP students are predominately from outside Cape Town

RESPONSE: The majority of students that are on the ECP are mainly from the Western and Eastern Cape with a small minority from the rest of South Africa and Africa. The presence of more students from these two provinces is mostly because of convenience of location since the university is in Cape Town. The Cape Peninsula University of Technology is the only university of technology in the province (Western Cape); On the other hand, the largest and most convenient city for people in the Eastern Cape is traditionally Cape Town. Consequently people in the neighbouring province relocate to Cape Town for studies. Cape Town hosts three (3) traditional universities and one (1) university of technology (UOT). The respondents' views are illustrated in Figure 5.8 below.

Figure 5.8 The lecturers' knowledge of the origins of ECP students
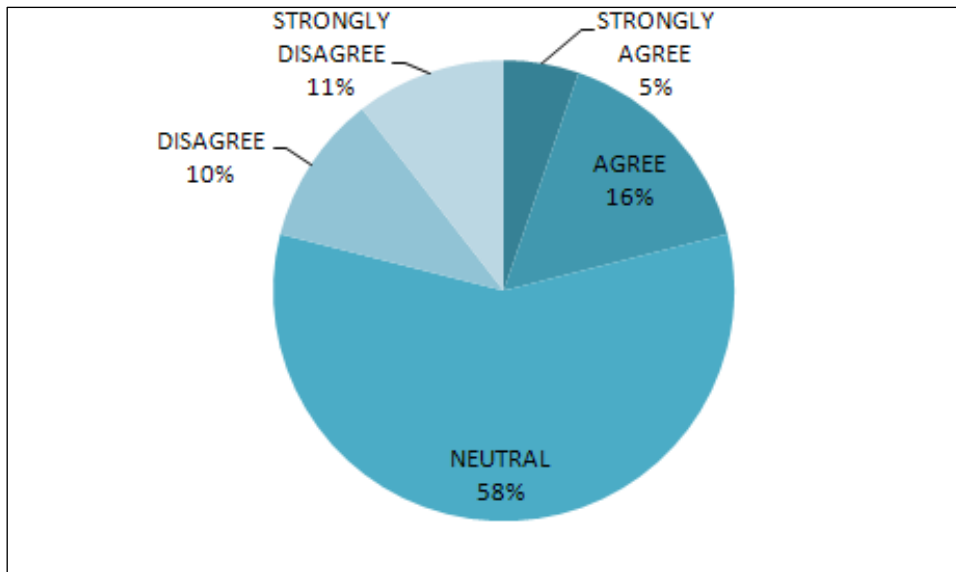
Source: own construction from researched data

From the information that is on the figure 5.8 above it seems that most respondents do not want to commit to the amount of students from outside Cape Town. The statistics show that 58% of the respondents are not sure or do not know much about where their students come from. Cognizance is taken of the fact that processing of applications is handled by the admissions office without the participation of the lecturers. A tie between those agreeing and disagreeing with the statement (21% each). This may be interpreted to mean that the lecturers have no knowledge about this. The number of foreigners in the programme will be inevitably very low, or they may not be any at all since the ECP was designed for South African students.

STATEMENT 5: I am not sure about the origins of these ECP students I teach

RESPONSE: Figure 5.8 and 5.9 are very similar as they deal with the make - up of the students in the classroom. This question was meant to check on the validity and reliability of the answers provided in figure 5.8 above. This statement was equally meant to illustrate the degree of objectivity in the admission process in that the lecturers would have little information about the about these students. This further shows that the lecturer student relationship appears to be kept at the professional level with contact restricted to the activities of learning and teaching. The respondents' answers are illustrated diagrammatically in figure 5.9 below in the form of a pie chart.

Figure 5.9 Lecturers who were aware of their students background
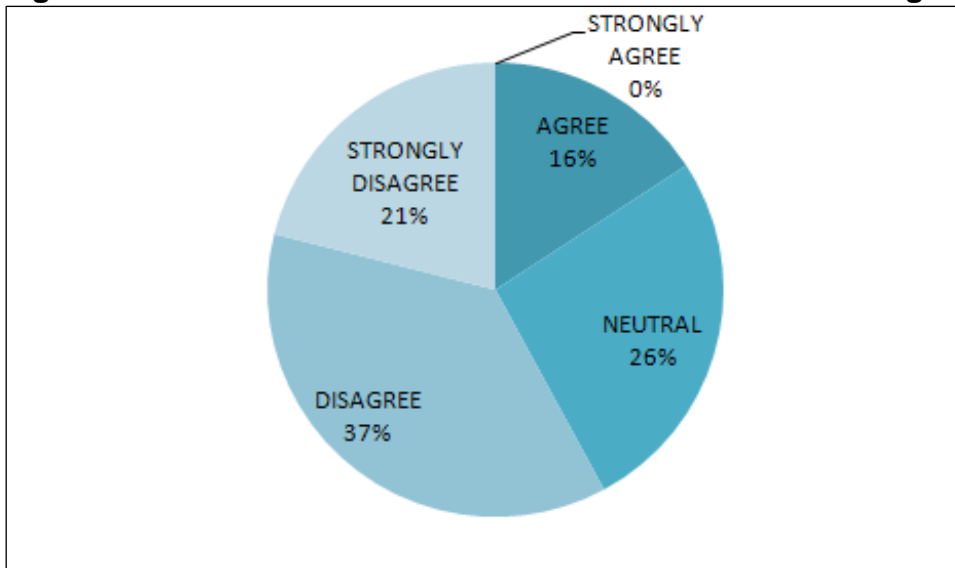
Source: own construction from researched data

Even though the two statements (statement 4 and statement 5) were essentially the same question asked differently, it was noted that the figures coming out were different. The ambivalent (neutral) are at a 26% just below half of the previous which stood at 58%. 16% of the respondents agreed that they know about the background of the ECP students they have in the departments. Whereas 58% (37% disagreed and 21% strongly disagreed) with the statement. It can be generalized that the majority (58%) that disagreed actually imply that they know about the ECP students' background. This is a problematic statement as in pie chart 5.8 the respondents did not know where their students came from. It is concerning that in both instances there is an unacceptably high percentage of neutral respondents.

STATEMENTS 6-10, LEVEL OF ADJUSTMENT TO TERTIARY EDUCATION

This section sought to measure the perceptions of the lecturers on what was perceived as "readiness for university." Matric pass is always used as a measure of the ability of a student to cope with tertiary education. The ECP programme was introduced for those that are believed to have been able to pass matric but may have failed to because of other circumstances, be they environment, economical or social.

STATEMENT 6 Mainstream students adjust faster right from the beginning

RESPONSE: The intake of students does not determine whether a student should be on the ECP. A series of tests and practical work determines if the student would benefit more from being on the ECP to Mainstream. In most cases mathematics plays a huge

role in the determining factor. All students find it hard to adjust from school to tertiary level. The results of which can be seen in figure 5.10 below.

Figure 5.10 Most respondents find this statement to be untrue
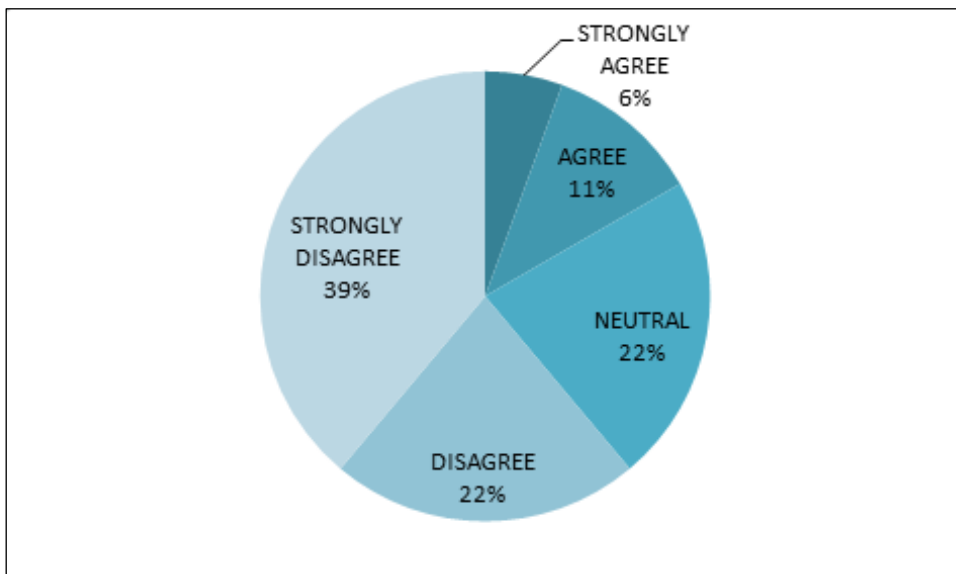
Source: own construction from data analysed from survey

Most of the respondents (39%) strongly disagree with this statement with a further 22% disagreeing; this points to the fact that the quality of the student is irrelevant. The students that arrive at a tertiary institution all have to experience the academic challenges and that puts all first years on an equal footing, whether it is on the ECP or on the Mainstream.

STATEMENT 7 ECP students struggle more adjusting to university lecturers

RESPONSE: The backgrounds of the students are a major contributor to how they adapt to the shift from school to tertiary education. Most students come from a disadvantaged background with schooling problematic in some areas. Today, around one in three of South Africa's nearly 800,000 higher education students are graduates from sub-standard schools and from low-income families. This could have a determining factor on how they cope with university lectures. The results of which can be seen in Figure 5.11 below.

Figure 5.11 Most respondents had equal opinions
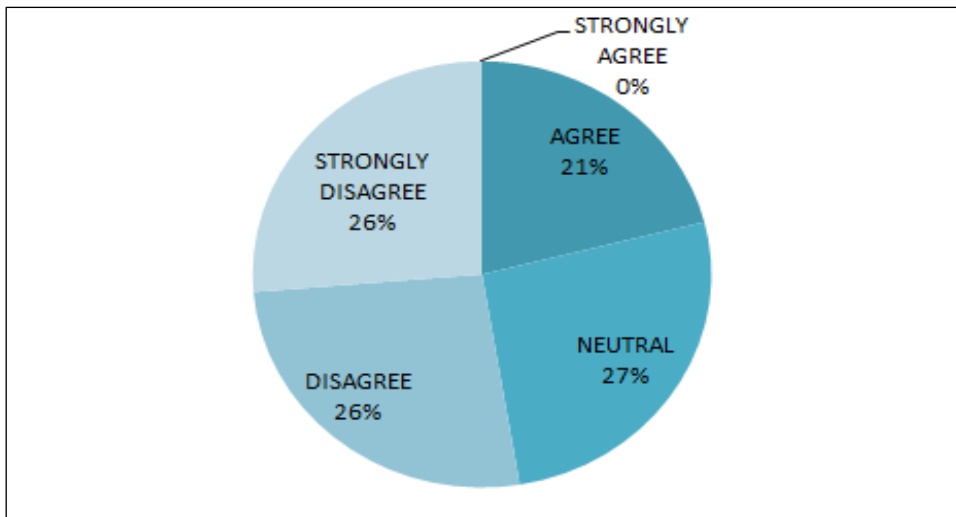
Source: own construction from data analysed from survey

Figure 5.11 clearly shows that the respondents seem to have a wide spread of opinions regarding whether the ECP students struggle more adjusting to university lecturers, however there is a feeling that most of the respondents disagree (26%) or strongly disagree (26%) with the statement. 27% remained neutral. The students are the ECP are given more time to adjust therefore allowing them to settle in more easily.

STATEMENT 8 From the onset the ECPs don't have a grasp of the subject

RESPONSE: The students are encouraged at all times to participate in class discussions and debates surrounding the subject matter. The practical component is then implemented from the theory. Due to the time factor that the ECP has at its deposal it gives the lecturer the time to integrate the student into their field of study. The results can be seen below in figure 5.12.

Figure 5.12 The respondents spread their opinions evenly
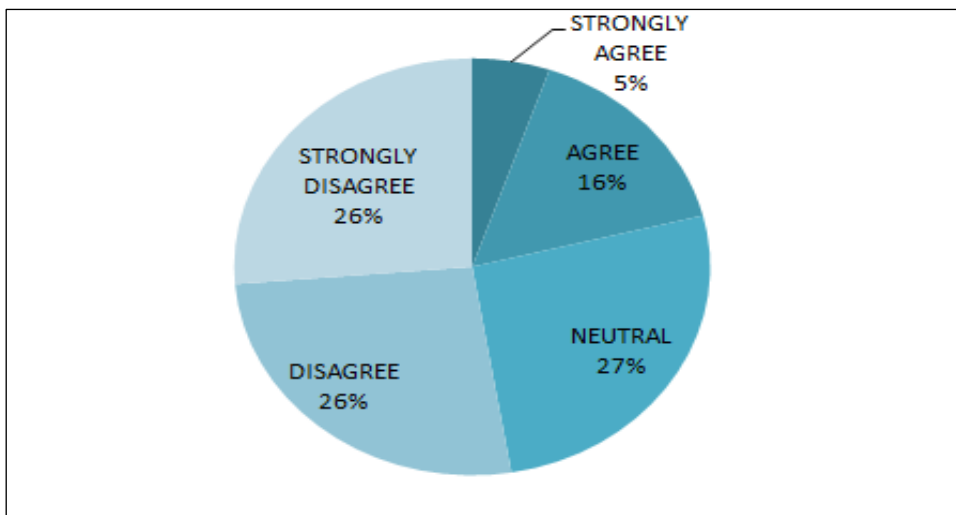
Source: own construction from data analysed from survey

Figure 5.11 and 5.12 are similar in their responses, therefore suggesting that the respondents feel that the ECP students are more than capable. In most cases the student wants to be in the field they have chosen, therefore they do grasp the basics. It must be noted that 27% of the lecturers remained neural which has an effect on the overall result.

STATEMENT 9 The adjustment of the students is the same for all students

RESPONSE: The above statement can never be true as each individual student is different. As human beings we adjust differently to different situations. Each student comes with their own social and psychological problems when entering a foreign environment; it's how they cope with the adjustment that determines their academic performance in the classroom. The responses are below in figure 5.13.

Figure 5.13 There is no clear answer from the respondents
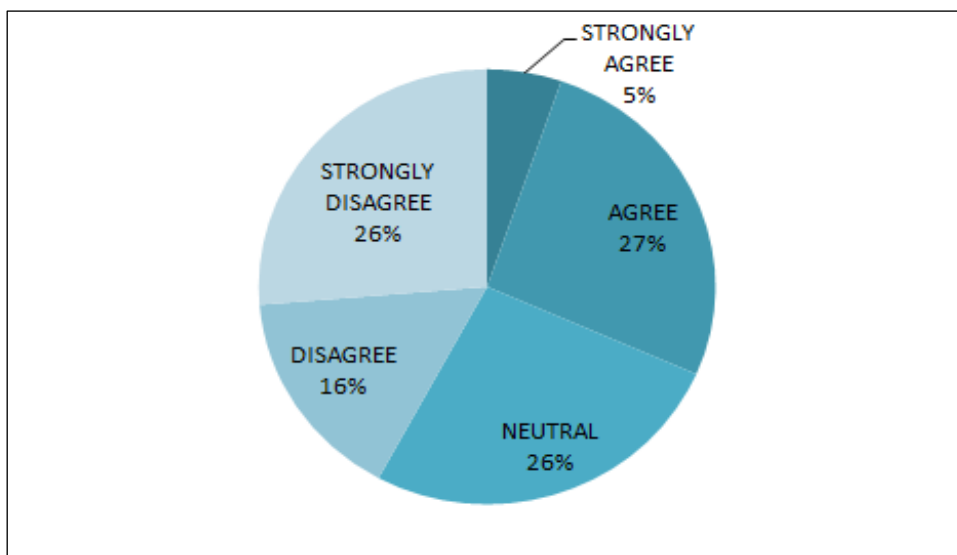
Source: own construction from data analysed from survey

Figure 5.13 clearly shows that the respondents are divided in their answers. 26% remained neutral in this regard which affected the overall result; however it confirms what was mentioned above that each individual responds differently.

STATEMENT 10 Adjustment is more an individual student matter

RSPONSE: The response in statement 9 corresponds with statement 10. The results are shown below in figure 5.14

Figure 5.14 Respondents clearly agree with this statement
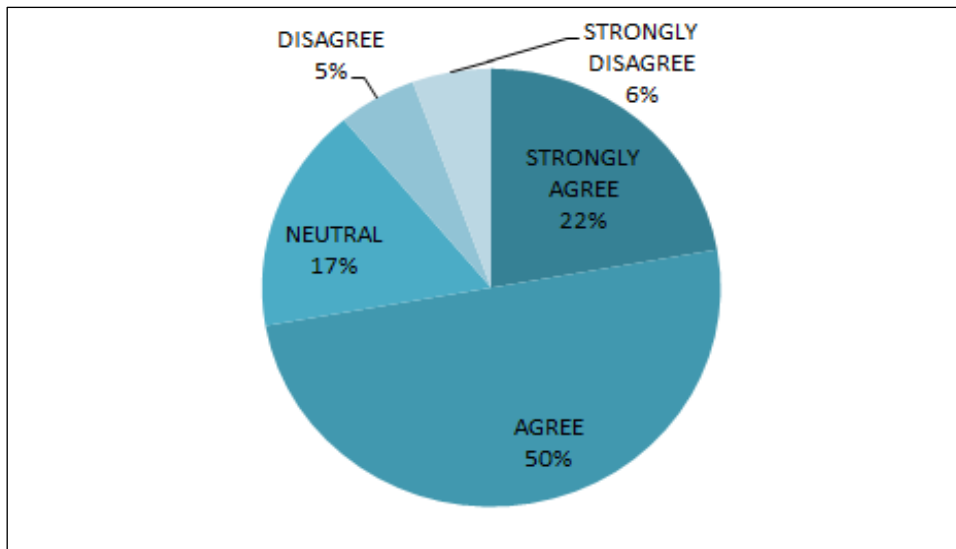
Source: own construction from data analysed from survey

50% of the respondents agree together with 22% (strongly agree) that adjustment is more an individual student matter. 17% remained neutral in this regard. The respondents agree with the statement which states that it is an individual who comes from different circumstances that determine how they cope with the transition as not on person is the same.

STATEMENTS 11-15, SUBJECT CONTENT [PRACTICALS AND THEORY]

STATEMENT 11 The subject course content is different between Mainstream and ECP

RESPONSE: The course content is exactly the same for both the ECP and the Mainstream. The only difference is the time taken to complete the course. Due to the fact that the ECP has more time more industrial visits can be done in order to integrate the theory into a practical environment. This allows the student a better understanding of the curriculum. Both the Mainstream and ECP graduate with the same diploma. Responses can be seen in figure 5.15 below.

Figure 5.15 Respondents very particular about answer
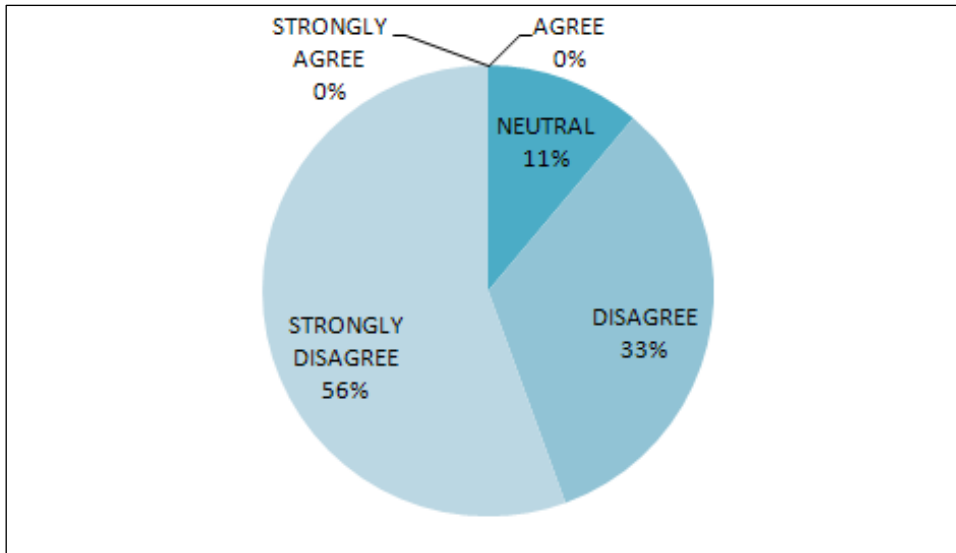
Source: own construction from data analysed from survey

Figure 5.15 is very decisive in its results with 56% strongly disagree and 33% disagree. This proves that the content is the same for both the ECP and mainstream.

STATEMENT 12 Students write the same exam for the similar subjects they do

RESPONSE: The same exam is written for both the ECP and the Mainstream as the syllabus is the same. In order for this to take place there has to be good communication between the lecturers to ensure that the course content and that the final outcomes are the same. Results are shown in figure 5.16 below.

Figure 5.16 Respondents seem to be unanimous in their response
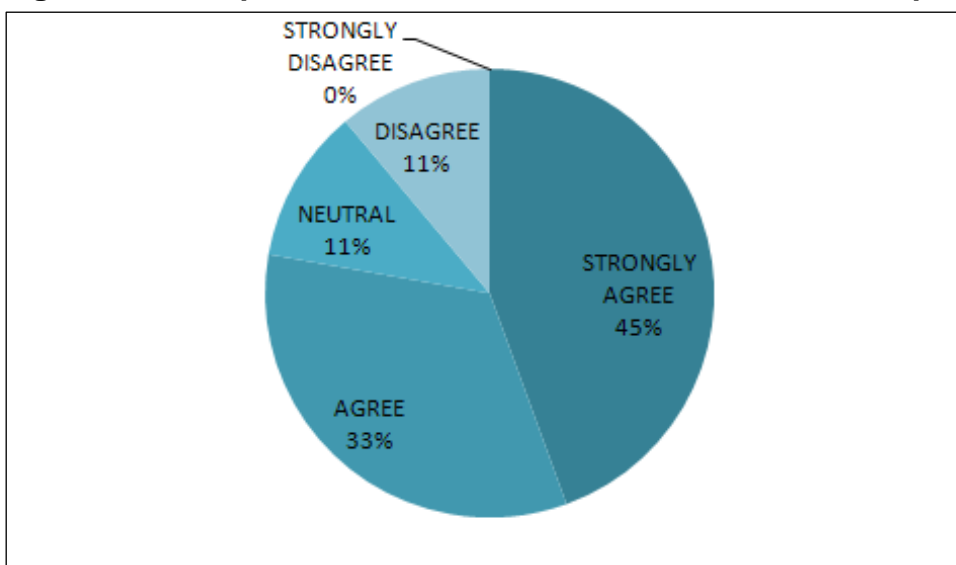
Source: own construction from data analysed from survey

Figure 5.16 clearly shows that the ECP and mainstream are in sync with one another with 45% strongly agree and 33% agree.

STATEMENT 13 The difference is merely in the FEWER number of subjects by ECPs

RESPONSE: The difference in the Mainstream and ECP is that the ECP first semester is spread over a year as opposed to the Mainstream which is over six months. ECP do the second semester in the second year with the Mainstream completing the first and second semester in one year. Responses are shown in figure 5.17 below.

Figure 5.17 Non-committal from the respondents
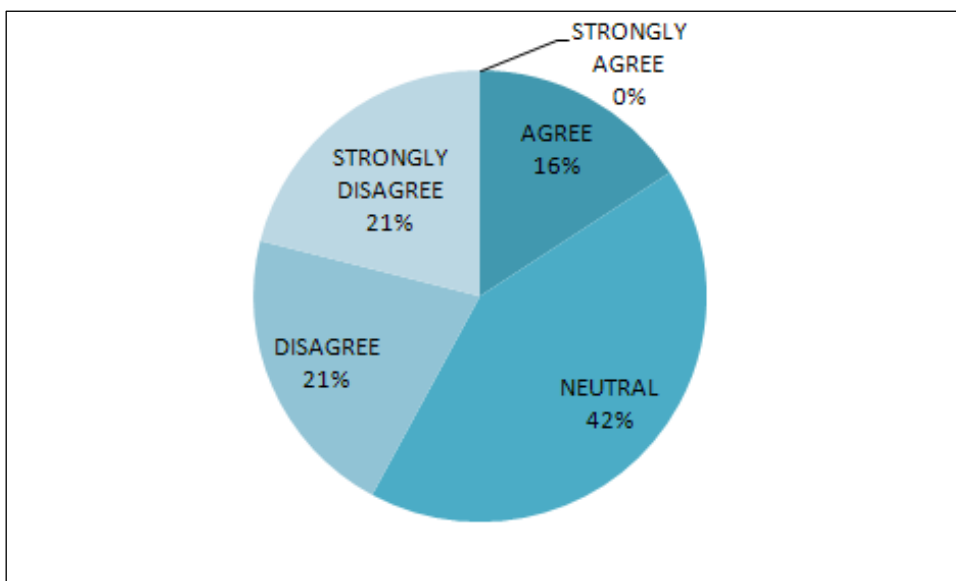
Source: own construction from data analysed from survey

42% of the respondents remained neutral; therefore it affected the overall result. The neutrals balance with strongly disagree (21%) and disagree (21%). These results contradict the curriculum lay out for the two streams

STATEMENT 14 ECPs are taught additional material to catch up with Mainstream

RESPONSE: ECP courses are extensions of mainstream subjects, the main difference being the additional content and activities increasing time on task and student engagement with the subject matter. This helps the student to grasp the theory more easily as more time is allowed to complete each task. Results can be seen in figure 5.18 below.

66

Figure 5.18 Extra material is added to the syllabus
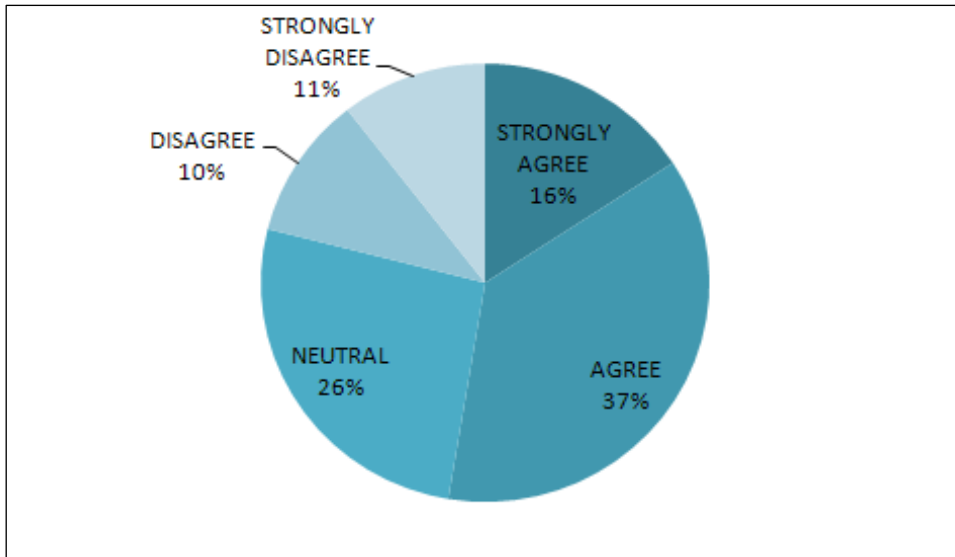
Source: own construction from survey

Figure 5.18 Clearly shows that 37% agree together with 16% strongly agree that the ECP is exposed to extra material which is introduced into their syllabus. This gives the students the opportunity to be integrated onto the Mainstream on an equal footing.

STATEMENT 15 ECPS are given more time than the mainstream students

RESPONSE: As stated in Statement 13 ECPs are given more time than the Mainstream students. Figure 5.19 below clearly shows this.

Figure 5.19 More time is given to ECP
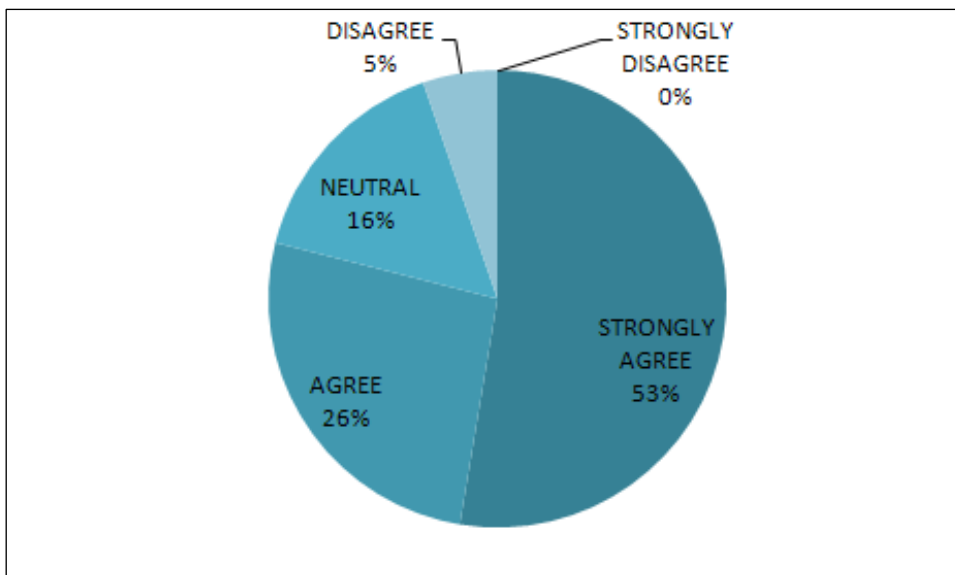
Source: own construction from survey

53% strongly agree together with 26% agree that the ECPs do get extra time to cover the work.

STATEMENTS 16-20, TIME TAKEN TEACHING

STATEMENT 16 Because ECPs are at risk we teach them more intensively than others

RESPONSE: The difference between these two offerings is therefore primarily the workload given to the ECP students in the first two years of their university life. It can be hypothesised that the assumption made here is that, provided with more learning time, the students will be able to perform equally. The response is in figure 5.20 below.

Figure 5.20 Respondents are decisive in their answers
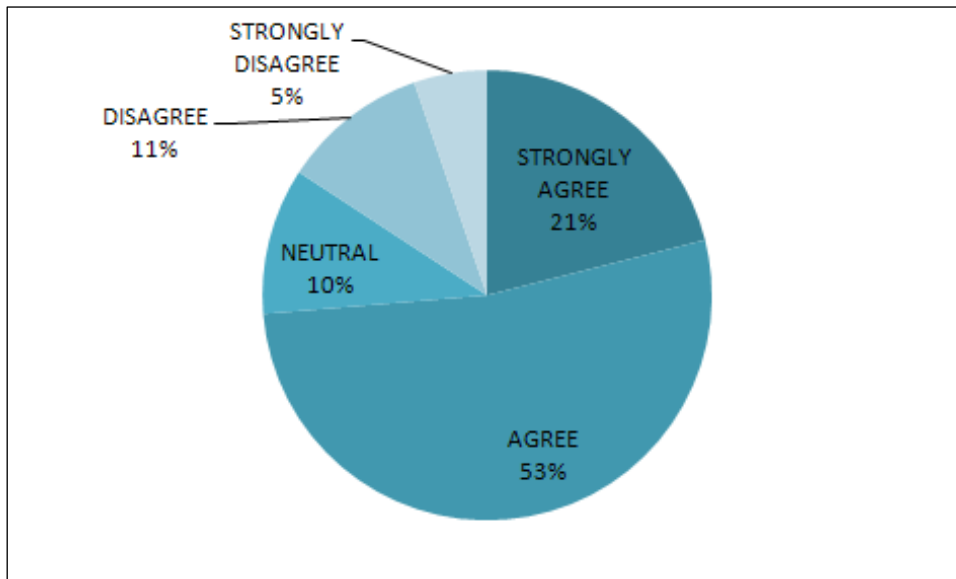
Source: own construction from survey

Figure 5.20 clearly shows that ECP students are more at risk with 53% agree and 21% strongly agree. This is a clear indication that the students need the extra time in order to be on par with their Mainstream counter parts.

STATEMENT 17 I put more care and time on ECPs because they are slow learners

RESPONSE: Statement 16 and 17 are closely related in the time factor. The lecturers do realize that the more time taken with an ECP student can improve their chances in succeeding academically and will find the integration onto mainstream less challenging. The response is in figure 5.21 below.

Figure 5.21 The respondents in general do care about their students
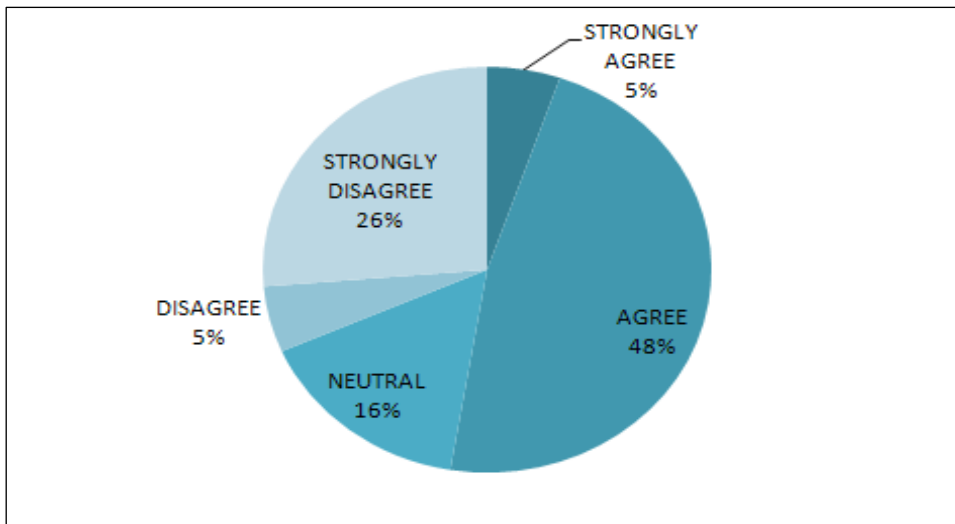
Source: own construction from survey

The majority being 48% agree do put in that extra time to help the ECP students reach the level that is expected of them. The following outcome supports the results from statement 16 which states that more time results in a better quality student.

STATEMENT 18 It's strenuous to go through the work of ECPs they take long to learn

RESPONSE: Mainstream lecturers do not enjoy teaching on the ECP as it can become tiresome. This is why a separate department with ECP lecturers needed to be established to counter act this problem; however the reverse is true with ECP lecturers teaching on the Mainstream in order to gain more experience and improve on the short comings that they might encounter. The response is in figure 5.22 below.

Figure5.22 Most respondents do not mind teaching ECPs
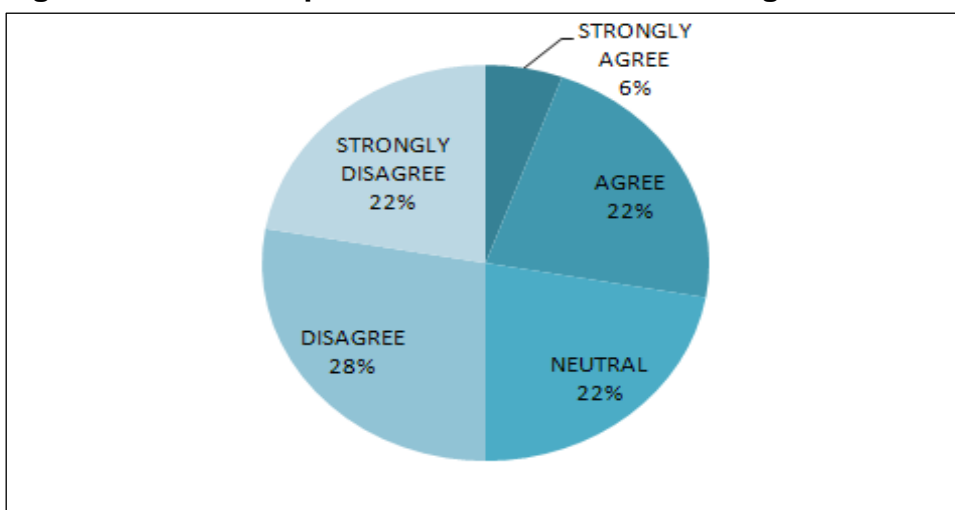
Source: own construction from survey

Figure 5.22 follows the trend of having a high percentage of (22%) for neutral; however in general the respondents are not finding it strenuous to teach the ECPs. This is a good indicator that the Mainstream lecturers are beginning to understand what is required when teaching the ECPs.

STATEMENT 19 I use different teaching methods for ECPs, they take long to learn

RESPONSE: Different teaching methods are incorporated into the curriculum as time allows for it. The main focus of this style is to pose questions to the students. This will allow the student to find the answers by using the necessary research technique thus improving their discipline, logic and thought processes. This method encourages dialogue between the lecturer and fellow students which encourages the sharing of ideas which can be used to find a solution. The response is in figure 5.23 below.

Figure 5.23 Most respondents have changed their teaching methods
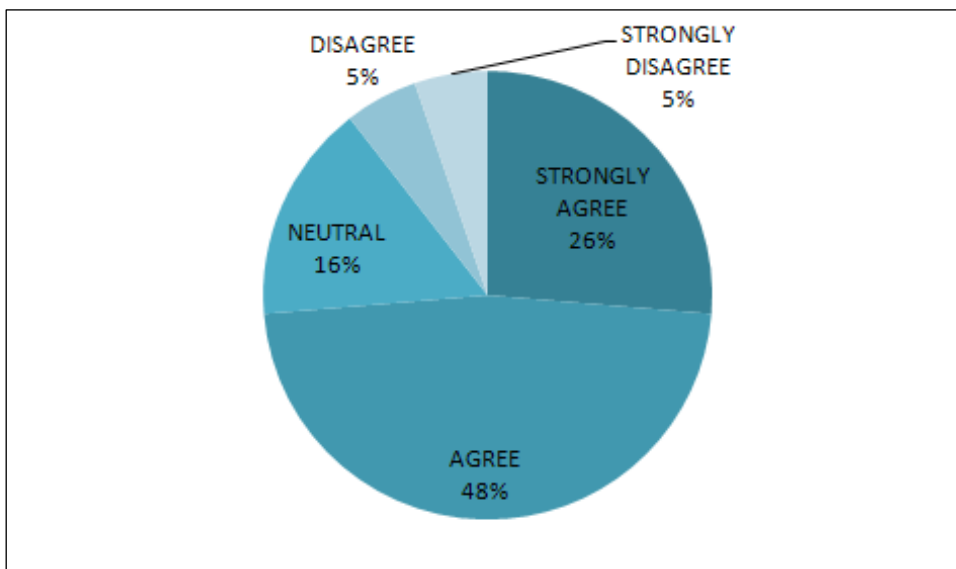
Source: own construction from survey

Figure 5.23 and 5.22 correlate as the respondents that did not find teaching the ECPs strenuous followed through by stating that they have changed their teaching methods with 48% agree and 26% strongly agree.

STATEMENT 20 I take the same time teaching the same material for both groups

RESPONSE: Time is an issue as the ECP has a year as opposed to the Mainstreams six months to complete a semester; therefore this statement cannot be true. The response is in figure 5.24 below.

Figure 5.24 The response is unanimous with this statement
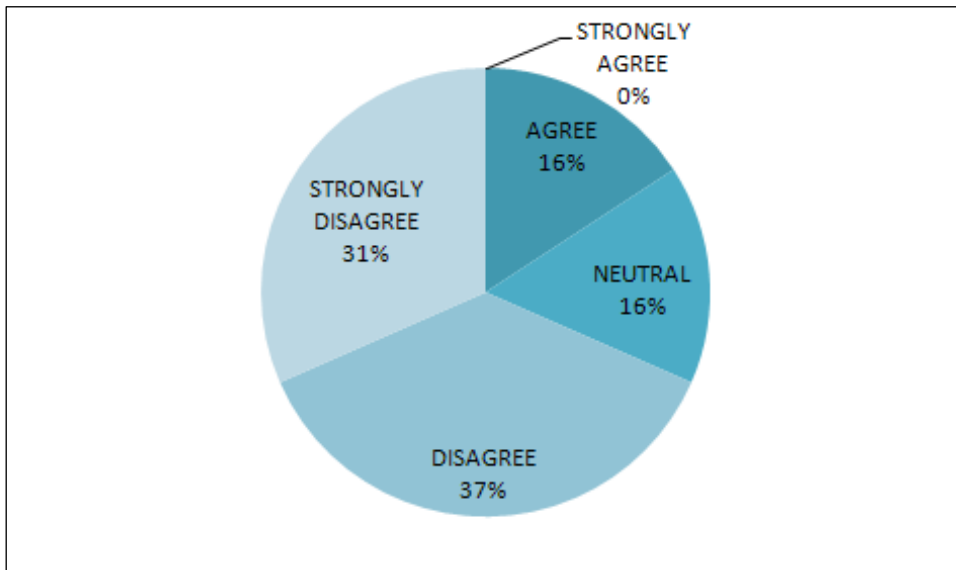
Source: own construction from survey

Figure 5.24 clearly shows that the respondents do not take the same time for teaching both groups. 31% strongly disagree together with 37% disagree.

STATEMENTS 21-25, STUDENTS RESULTS QUALITY

STATEMENT 21 Mainstream students always outperform the ECP students in results

RESPONSE: There has always been a stigma that the ECP students are not of a good quality. This is not true as in both cases the students come from the same backgrounds and are on an equal footing when they arrive at a tertiary institution.The introduction of the ECP is to eliminate under-preparedness of the students who are entering tertiary institutions for the first time. This gives each ECP student the opportunity to perform well and be at the same standard as a Mainstream student.The response is in figure 5.25 below.

Figure 5.25 This statement is proved wrong
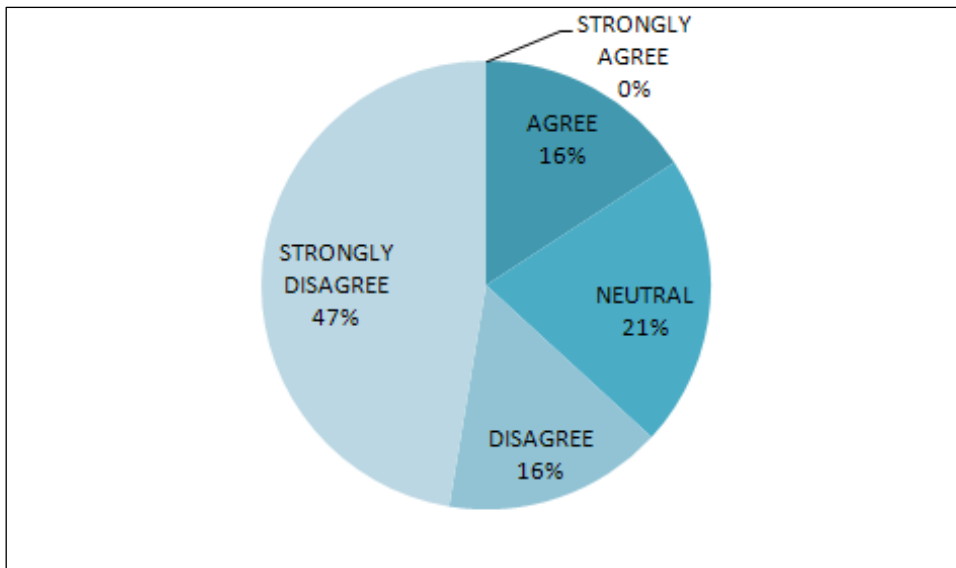
Source: own construction from survey

47% of respondents strongly disagree that the mainstream students outperform the ECP students. This indicates that the ECP students are well prepared and are more than capable of having the same outcomes as the Mainstream students.

STATEMENT 22 You can tell from the marked scripts an ex-ECP from a mainstream

RESPONSE: There should be no difference when it comes to marking the papers from both departments as the curriculum is the same. The students whether they are on the ECP or Mainstream should be at the same level when it comes to writing exams. The response is in figure 5.26 below.

Figure 5.26 Respondents are split in this regard
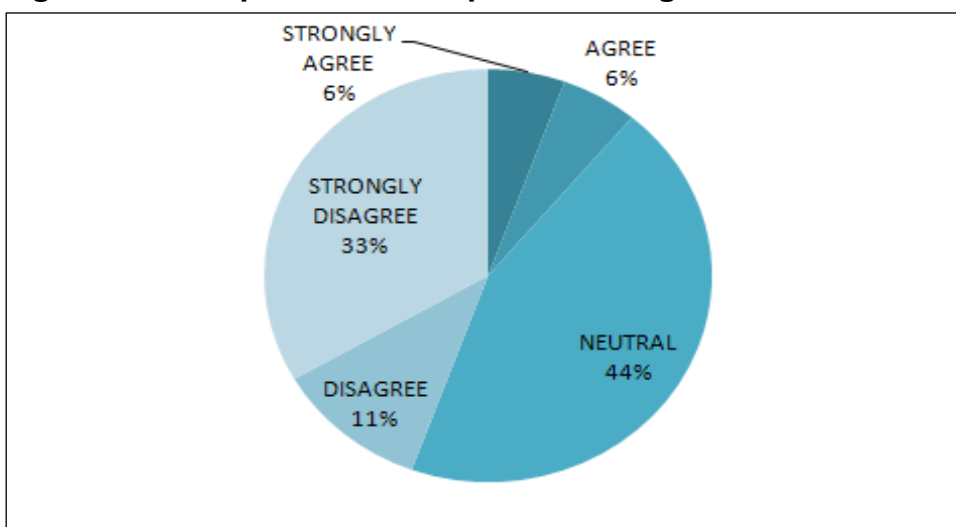
Source: own construction from survey

Figure 5.26 shows that 33% strongly disagree and 11% disagree which indicates that the respondents are not too sure which scripts they are marking. This proves that the students cannot be determined by the department that they are in; however it must be noted that 44% of the respondents remained neutral in this regard which has affected the overall result.

STATEMENT 23 You cannot tell from the performance an ex-ECP from mainstream

RESPONSE: Statement 22 and 23 are very similar and therefore has the same outcomes. It must be noted that when lecturers mark papers they are not aware of the origins of the students that are in their class, this is due to the size of the class. The lecturer is lecturing a student who has the ability to do the subject as they have passed the necessary subjects to get to this point. The response is in figure 5.27 below.

Figure 5.27 No decisive answers
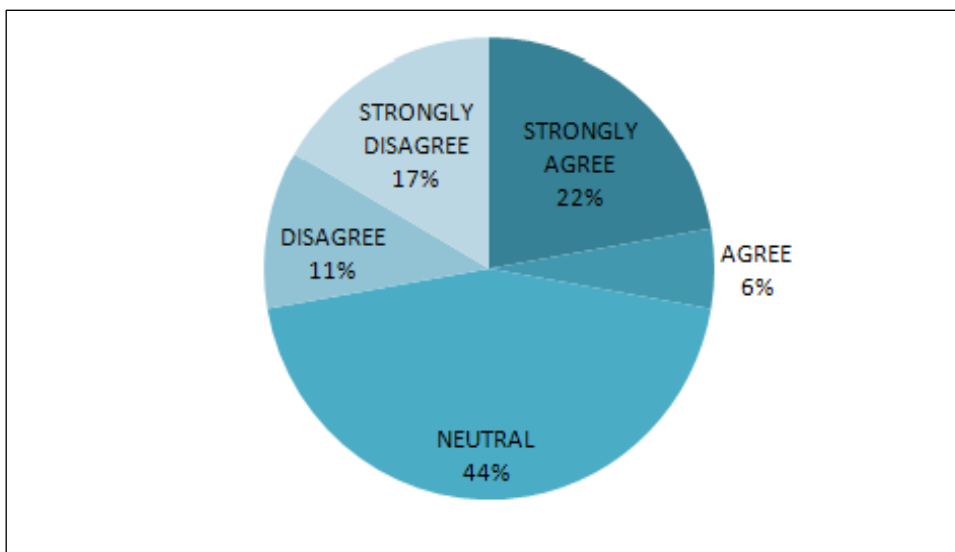
Source: own construction from survey

44% neutral with the rest of the results split does not give a clear indication of the statement

STATEMENT 24 ECPs were well groomed so they perform better than mainstream

RESPONSE: The ECP students will have a slight advantage due to the time factor. They have more time to understand concepts that are taught to them and have the luxury of having extra activities to allow them to absorb more information. The main goal of the ECP is to prepare the student so that they can enter the Mainstream and be able

to cope with the faster pace that comes with it. At the end of the 2 years the ECP student will be at the same level as a Mainstream student if not slightly ahead. The response is in figure 5.28 below.

Figure 5.28 Respondents seemed to agree with this statement
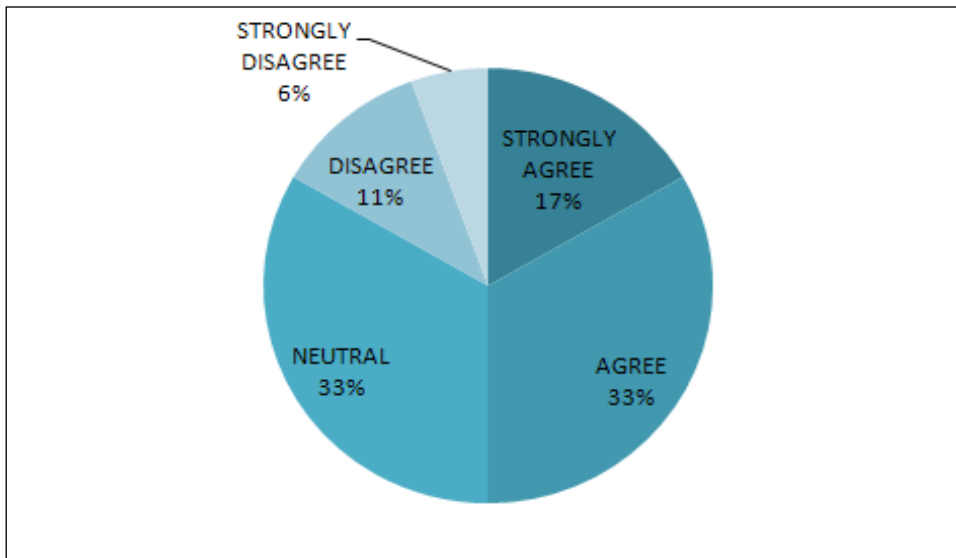
Source: own construction from survey

The high percentage 33% of neutral does affect the overall result; however 33% agree with the fact that the ECPs are well groomed and perform better than mainstream. This result indicates that the ECP has achieved on what it has been tasked with. To produce a student who can be on par with its Mainstream counterpart.

STATEMENT 25 Performance depends on student's individual effort not on the stream

RESPONSE: It is common knowledge that what you put in is what you get out. In order for a student to succeed it is important that they work hard and take their studies seriously. The ECP together with the Mainstream lecturers can only do so much to improve the overall quality of the student. The response is in figure 5.29 below.

Figure 5.29 Respondents were unanimous
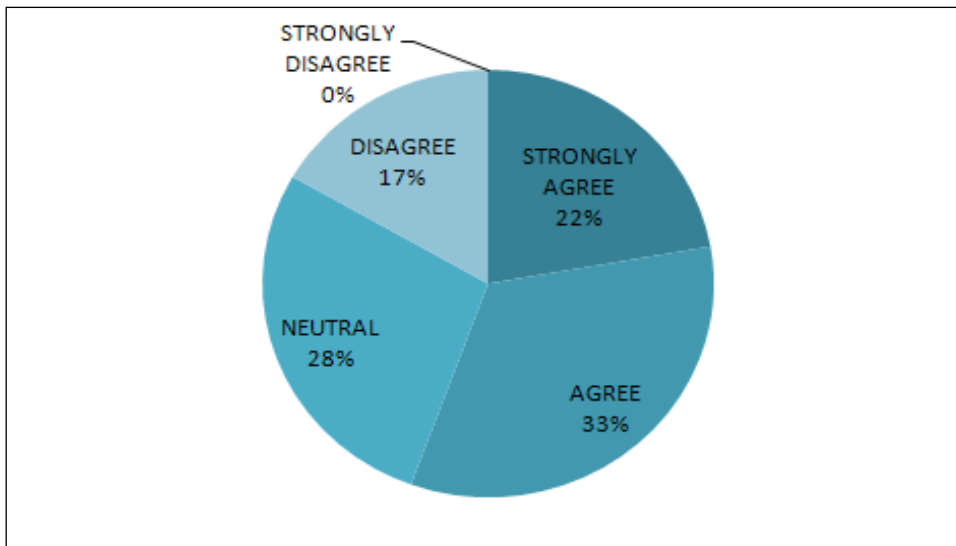
Source: own construction from survey

Figure 5.29 clearly shows that the respondents agree (33%) and strongly agree (22%) with the statement that it is the students' performance not what stream they are on.

STATEMENTS 26-30, WHAT DRIVES STUDENTS TO PASS

STATEMENT 26 Beyond lecturing, a student plays a big role in their academic success

RESPONSE: The main reason for a student succeeding is the amount of effort they are willing to put in to get a positive result. However it must be noted that the lecturer also needs to have the necessary skills in order for the students to understand the concepts that are taught in the classroom. It can be looked upon as a symbiotic relationship where the knowledge gained in the classroom can only benefit the student and allows the student to put forward questions that will improve their skills. The response is in figure 5.30 below

Figure 5.30 Respondents were decisive in this regard
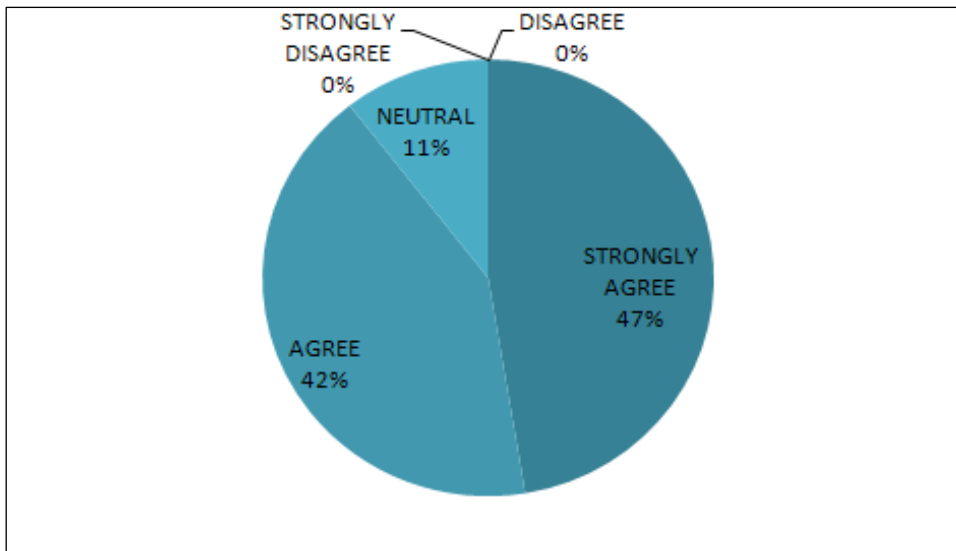
Source: own construction from survey

Figure 5.30 clearly shows that the respondents are in agreement with the statement. 42% agree followed by 47% who strongly agree. It can be seen that the relationship between the student and the lecturer will determine the quality of the end product.

STATEMENT 27 The student's attitude towards studies determines their performance

RESPONSE: Statements 26 and 27 are linked and will therefore produce the same result. The students overall attitude will determine their overall performance in the classroom.

The response is in figure 5.31 below

Figure 5.31 Respondents are unanimous
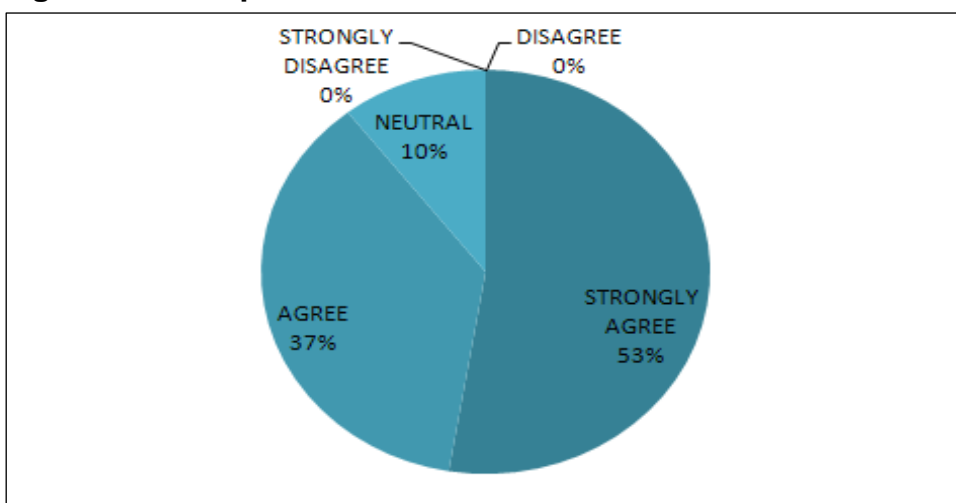
Source: own construction from survey

Figure 5.31 and 5.30 are closely related therefore similar results were seen.

53% strongly agree with 37% agree. 11% were neutral which might have changed the final result by a small margin.

STATEMENT 28 Quality of students' performance is a direct result of quality lecturing

RESPONSE: The quality of the lecturer helps with understanding and allowing the student to grasp concepts more easily; however it must be noted that it is the students responsibly to go through the work and to ask questions in order to solve problems that they might be experiencing in the subject. It is important that the student has a strong foundation from the classroom in order to improve their knowledge and skills. If the lecturer is not quite up to standard this can also have a negative impact on the students overall performance. The response is in figure 5.32 below

Figure 5.32 The respondents reacted positively to this statement
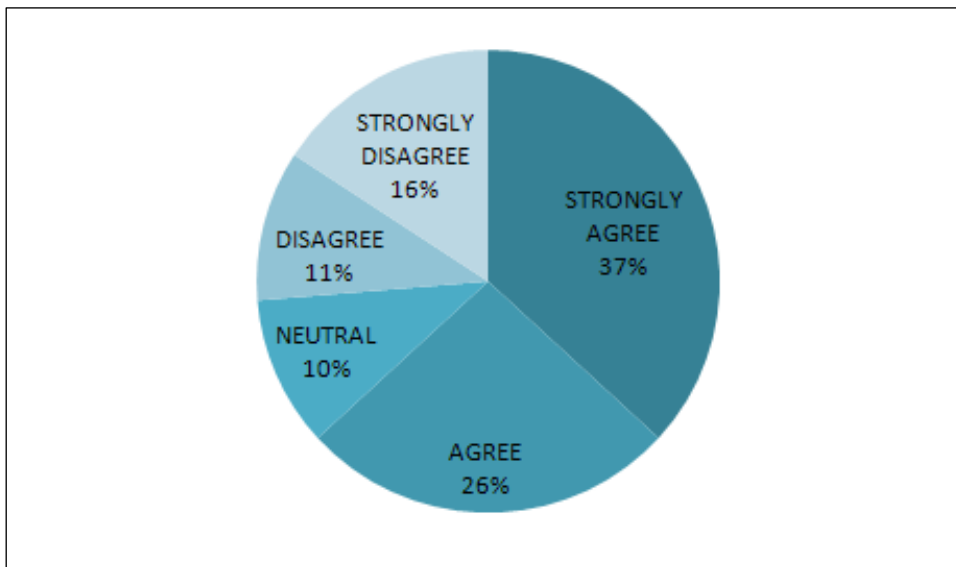
Source: own construction from survey

Figure 5.32 clearly states that the respondents strongly agree (37%) and 26% agree that lecturing plays an important role in the students' performance.

STATEMENT 29 Passing is 90% genius and 10% personal effort from the student

RESPONSE: In general it is the amount of effort a student puts in to their studies that determines their final result. The subject matter is not something a student can assume they know the answers to if they did not have the prior knowledge to start off with. The response is in figure 5.33 below

Figure 5.33 Most respondents find this untrue
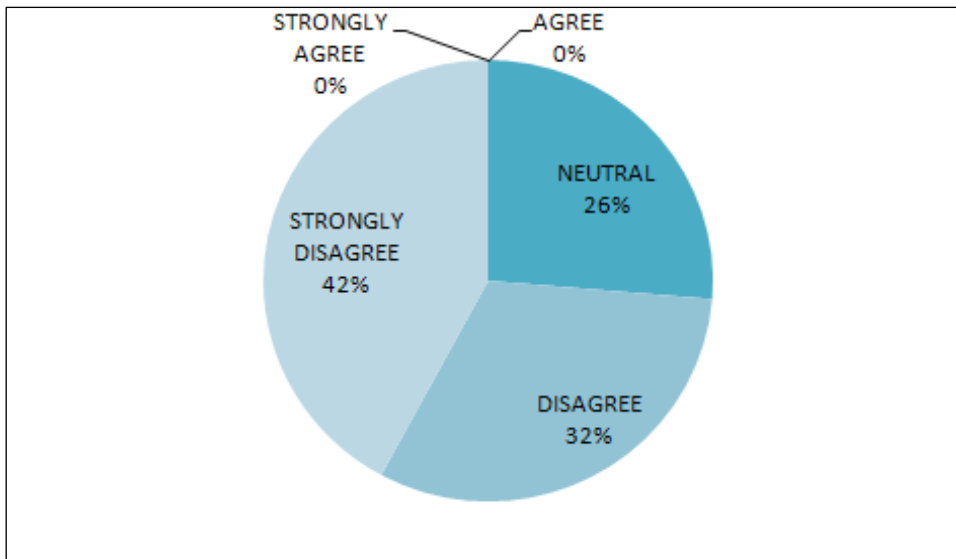
42% of the respondents strongly disagree to the statement, with none of the respondents in agreement. This indicates that the respondents put it down to lecturing as shown in the results of figure 5.32.

STATEMENT 30 Students would not pass if the lecturers were not that effective

RESPONSE: Lecturers are put into a position to teach students the necessary skills in order to improve themselves by obtaining a degree/diploma. Students can also take it upon themselves to do extra work to help to better understand the subject matter. The efforts of the lecturer and students can determine the final outcome. The response is in figure 5.34 below.

Figure 5.34 Respondents split on this statement
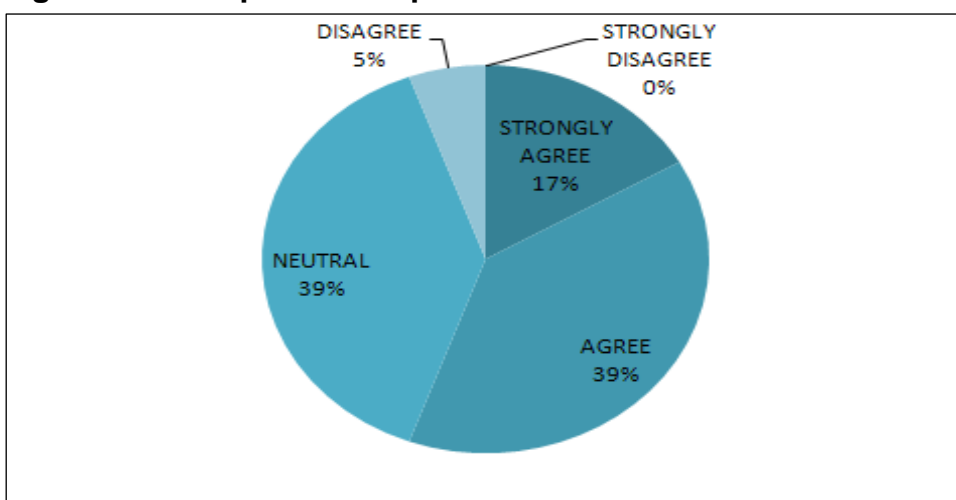
39% of the respondents were neutral which indicates they are not prepared to make a statement. It must be noted the 39% agree and 17% strongly agree that lecturers play an important role in the students' academic path.

SECTION C OPEN ENDED SECTION

In this section three (3) open ended questions were put forward to the respondents.

This will be used to determine whether or not there are similarities or differences in lecturing ECP and mainstream students. The respondents were also asked if there are any issues with the final ECP and mainstream products. Any other issues that were not covered by the survey

STATEMENT 1 Identify key differences and similarities in the lecturing methods you use between ECPs and mainstream students

Table 5.2: Similarities and differences in lecturing methods

SIMILARITIES	DIFFERENCES
PowerPoint	Industrial site visit
Tutorials done outside class	Tutorials done in and outside class in ECP
Spot test	Outside project exposure
Content	Time on task
Exams	Additional assistance
Same expectations	More opportunity to practice
Same syllabus	Cope and adjust better than mainstream
	More class time to go from the beginning of each concept to explain reasons of actual formulas or definitions

Source: own construction

STATEMENT 2 Please state any other issues relating to the quality of the final ECP product from the stream on the basis of comparison between ECP and Mainstream products.

- The student from the ECP final product has a deeper understanding of the subject compared to the mainstream student.

- In the mainstream it is extremely difficult to take students to industrial visits where students can see what they are being taught. It makes it easier for students to remember their theory if they can link it with the practical application in industry.

- There seems to be a lack of budget towards students activities such as site visits and payment of extra tutors

- According to studies done , ECP students are outperforming the mainstream students

- ECP students get a better foundation

- The mainstream students do not get the attention they need as there is not enough time

- ECP students who make it to S3 seem to have adjusted better than the mainstream student because the time allowed for reflection of the work done.

- Some ECP students struggle with the pace when joining mainstream but soon adjust

STATEMENT 3 Anything else you may want to say in relation to the information that you have provided, including what you think should have been included in such a survey.

- More time is needed for mainstream student., time limitation the students pass without full understanding of the work

- The questions are in many cases unclear. An answer does not comprehensively cover the results

- The percentages of ECP to mainstream students would have shed a better light on the size of each department

- Lecturers rarely check which students they have in their class, however those who perform well are indeed ECP students

- The quality of the lecturer and the desire of the student have a huge impact on the final result.

- The circumstances of a student also plays a role in the effort the put in

5.3. CONCLUSION

The questionnaires results are very much in favour of the ECP and that it is a viable option for the students to register for the programme. The lecturers are supportive of the initiative, however it must be noted that it is up to the students to make the effort in their studies. The results were not that satisfactory to the researcher as many of the respondents chose to remain neutral in many instances. This had an overall impact on the results and should not be looked upon as a generalisation. A further study at another institution would give a better result in this regard. Giving the students more

time has strengthened their chances in integrating into the Mainstream. The lecturers are encouraged by the quality of the student that is produced by the ECP and they found that once the students were together it was difficult to differentiate the difference between the between the two streams. The ECP is a programme that allows students the opportunity to study at a tertiary institution where as before the opportunity did not exist. This can only have positive results for the future,

CHAPTER SIX:
SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The research study was a result of observations that led to the review of literature extensively on the subject of the Extended Curriculum Programme (ECP). It was first looked at with a lot of questioning as it was perceived to be another way of lowering the standards in the universities. The extended literature review resulted in the construction of the proposal which was later converted to the current chapter one of the dissertation document herewith presented. The first chapter therefore dealt on the introduction of the study, the background to the study which culminated in the identification of a study gap (problem statement), the research objectives, the research question and the research design and methodology. Chapter two focused on the conditions in the high schools which are the primary reason to justify the ECP. The history of the ECP from when it was the Foundation Phase through the bridging programmes until the emerging of the ECP is discussed. Chapter 3 focuses on the implementation of the ECP in its current state with reference to the challenges that are encountered in the processes of the programme. Chapter four explains in detail the problem statement, the primary and secondary research objectives, research questions (main and sub-questions), the research design and the research methodology are differentiated in the chapter. Further to this the research methodology is taken up in detail including detailing the differences between the qualitative and quantitative research. The population, sample and sampling methods are also discussed in detailed. The chapter ends with a focus on the research instrument, the data collection methods, and data analysis which illustrated the findings by comparing the variables and how they are related. Chapter five is the interpretation of the illustrations (charts, frequency polygons, graphs, histograms and tables). This chapter, the final chapter summarises the findings recorded in the previous chapter (chapter five) and makes conclusions and provides recommendations. This is done question by question using the format that was used in the preceding chapter (5).

6.2 FINDINGS

As alluded to earlier, the questionnaire was divided into three sections, as classified as; Section A – Biography, Section B – Likert scale and Section C – Open ended section which allowed for interaction between researcher and the subjects. The approach to the chapter therefore involves the stating the question or statement as it appears in the

questionnaire, conclusion follows (based on the findings recorded in chapter five) and the recommendations follow.

6.3 SECTION A – BIOGRAPHY

Primarily intended to identify the participants and their relevance to the study, the questions merely wanted details about them. In this section there is no need for conclusions and recommendations. It can however be stated that 70% of the respondents are lecturers, 15% are senior lecturers with the other 15% classified as other. This may be support staff including administrators and it is clear from the findings that the HOD did not participate in the survey. Of these respondents 75% of them claimed that they were directly involved in ECP operations. The remainder of 25% was comprised of 5% that used to be but now are not. **Conclusion –** the participants are relevant to the study as they have directly interaction of the ECP candidates or had been before.

Of these participants, 72% of the respondents had been with the ECP for a minimum of 2 years with 22% having been involved with ECP for "just under a year." Those who had been just over a year and under 2 years stood at the least. **Conclusion** - It may be concluded from the statistics that the ECP is growing in size, using the increase in number of people coming into the programme. Of those who lectured ECP (72%), 61% of them actually lectured other subjects outside of the ECP structures. **Conclusion** – it can be concluded with no remorse that because the majority of these lecturers had exposure to both streams, they would be the most ideal to provide the information required.

When the respondents were asked for any other extra information, they provided critical information that cannot be summarised; this is recorded in table 6.1 below.

Table 6.1 Respondents' opinions on the subject

More practicals	There is need for more time and opportunities for the students to do practicals in the laboratories for them to understand
Time explaining	More time is spent explaining some of the concepts to enable the students to grasp the knowledge and information required of them
Time to complete	There is always ample time for the lecturers to complete the work and we should avoid rushing the students through the syllabus
Repeating	Continuously going back to the difficult sections of the syllabus makes it possible for the students to grasp the subjects well
Industry visits	There is enough time to take students on industrial visits, and these should be planned to allow for frequent visits to give exposure

Good foundation	Industry visits give the students a good foundation that will help in their future studies as they can related theory to practical work

Source: own construction

The general feeling was that though these learners came from poor schools where they did not get much of the resources needed to enable them to pass; they showed in the ECP programme that they were actually university material. **Conclusion –** It can be concluded, prematurely though, that there is a genuine cause for giving these matric failures into university success stories.

6.4 SECTION B – THE LIKERT SCALE

Ranking of the statements is the format used universally for the Likert scale. The following scale: 1=Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 5 = Strongly Disagree was used.

STATEMENTS 1-5; KNOWLEDGE ABOUT THE CALIBER OF THE STUDENTS

Because the respondents are involved with the students in the class room, during consultations and the normal lecturer-student interactions, the lecturers can assist with information on the calibre of the students.

STATEMENT 1, All the ECP students in my classes is black students

Conclusion – With findings indicating that 58% of the respondents thinking that the ECP students are not all black and yet 31% suggest that all students are black, it is difficult to understand why these lecturers would not know. It can be concluded that the method used for classification of black may be problematic since black according to the constitution means everyone who is not white. But in the streets people classify themselves as, black (Africans), coloureds or Asians. **Recommendations**: It would be proper for the university to decide on a university wide classification to enable clear identification of who the beneficiaries are by race.

STATEMENT 2 There are more coloureds than whites [students] in the ECP

Conclusion: It can be concluded that there are more coloureds that whites in the system and this can be understood on the basis of the demography of the country, and especially of Cape Town where the racial ratio is, 1:12:26:31 (Indian: white: black: coloured) respectively. **Recommendations:** The uncertainty by the respondents (57%

agreeing and 27% disagreeing) indicates the confusion – again the university needs a standard race classification system.

STATEMENT 3 There are more females than males [students] in the ECP

Conclusion: It is surprising that neutral stands at 47% with 43% disagreeing and 10% agreeing – it can be concluded that the responses coming from the respondents cannot be trusted. It would not be difficult to know in class if there are more females than males. **Recommendations:** No recommendations are made here.

STATEMENT 4: The ECP students are predominately from outside Cape Town

Conclusion: Neutral stands at 58%, it can be concluded that the respondents would not know where students come from since there is one universal language in the university – English. **Recommendations:** No recommendations are except to say it would have helped to know where the students come from predominantly in order to indicate where the high schools that need help are located.

STATEMENTS 6-10, LEVEL OF ADJUSTMENT TO TERTIARY EDUCATION

This section sought to measure the perceptions of the lecturers on what was perceived as "readiness for university." Matric pass is always used as a measure of the ability of a student to cope with tertiary education. The ECP programme was introduced for those that are believed to have been able to pass matric but may have failed to because of other circumstances, be they environment, economical or social**.**

STATEMENT 6: Mainstream students adjust faster right from the beginning

Conclusion: It can be concluded that the respondents (61%) do not see any advantage the mainstream students have over the ECP students in relation to adjusting to tertiary education. **Recommendation:** It would be proper to enable the different streams to do certain subjects together – say laboratory work right from the early stages. This may help the ECP candidates to develop self-esteem where they have always been considered as good enough to be put into the mainstream.

STATEMENT 7: ECP students struggle more adjusting to university lecturers

Conclusion: The presence of 27% respondents opting to be neutral shows the uncertainties about this issue amongst the respondents. With 52% disagreeing, it can be concluded the lecturers do not seem to identify any marked differences along the

lines of ECP and Mainstream. **Recommendations:** It is recommended that regular assessments be made by departments to compare the performance of these two streams and justify if possible the existence of the ECP offerings.

STATEMENT 8: From the onset the ECPs don't have a grasp of the subject

Conclusion: With 52% disagreeing and 27% unsure – it can be concluded that ECP students are equally competitive like their mainstream counterparts and their matric results are not a true reflection of their intellect. **Recommendations:** It is hereby recommended that the ECP enrolment should be increased to bring in many more prospective success stories that are now left out from tertiary education because of their poor performance at matric level.

STATEMENT 9: The adjustment of the students is the same for all students

Conclusion: With those agreeing at 32%, those disagreeing at 42% and neutral at 26%, it is hereby concluded that the respondents are divided and have no one predominant opinion on this issue. **Recommendations:** No recommendations are possible given the results coming from the survey.

STATEMENT 10: Adjustment is more an individual student matter

Conclusion: A resounding 72% of the respondents posit that the ability to adjust to tertiary environment involves people as individuals. It is therefore concluded that each student has to make a decision of their own to fit into the new tertiary environment. **Recommendations:** It is recommended that the university or departments have a personalised programme to assist new students and enable them to adjust to the otherwise threatening academic environment.

STATEMENTS 11-15, SUBJECT CONTENT [PRACTICALS AND THEORY]

This section was designed to interrogate the respondents in relation to the course content offered to the ECP students, whether it was "lighter" than the traditional mainstream curriculum. The general understanding was that ECP students may not be as able to take on tertiary education as those who had passed their matric with exemption.

STATEMENT 11: The subject course content is different between Mainstream and ECP

Conclusion: A good 89% of the respondents most of whom lecture in both ECP and Mainstream asserted the view that there is no difference in the subject content. It can therefore be concluded that ECP students are equally as able as the mainstream students. These students may have failed to pass matric with exemption because of other factors. **Recommendation:** It is hereby recommended again that the university should expand the programme (student enrolment) as there are many prospective tertiary students who are thrown out because they failed matric, when, with a second chance, these would excel.

STATEMENT 12: Students write the same exam for the similar subjects they do

Conclusion: It is concluded here that there is no special treatment (level of exams) as indicated by 78% of the respondents who said that the ECP and Mainstream students write the same exams. **Recommendations:** It would be recommended that continuous comparisons be made between students from these streams and identify if there is a valid case for using matric pass as the only means of admitting students into university.

STATEMENT 13: The difference is in the fewer number of subjects by ECPs

Conclusion: The difference between ECP and Mainstream is in that ECP students have fewer subjects per year and thus it takes them an extra year to complete the same syllabus. The neutral and those disagreeing are both at 42% each. It can be concluded that the lecturers are not sure whether the good performance of ECPs is because they had a lesser load per year. **Recommendation;** No recommendation is made except to suggest that further studies be carried out on this aspect.

STATEMENT 14: ECPs are taught additional material to catch up with Mainstream

Conclusion: 53% believe that extra material is provided for to the ECP students and the neutral stand at 26%, it can be concluded that there is a high possibility that extra effort/assistance may be given to the ECPs. **Recommendation:** It is recommended here that if the performance of the ECP is presumably based on the extra material, it would be wise to use the material (expanded0 on all the students to improve the learning for all the students.

STATEMENT 15: ECPs are given more time than the mainstream students

Conclusion: It can be concluded here that because ECPs are given more time (79% of respondents) and hence they have a reason to perform well. It is not clear if the extra time in tuition for the same subject or because it takes them longer to complete the course. **Recommendations:** If the time taken does not reduce the quality, it is recommended that those students interested in that programme be allowed regardless of whether or not they would have qualified for the mainstream.

STATEMENTS 16-20, TIME TAKEN TEACHING

STATEMENT 16: Because ECPs are at risk we teach them more intensively than others

Conclusion: Another question relating to the teaching methods for the ECP results in 74% of the respondents' state that the ECP students are taught intensively. It can be concluded therefore that students who have well-structured and context relevant teaching systems are likely to learn more and achieve good marks. **Recommendations:** It is recommended that this method of teaching should be extended to other streams, and that more other students without matric exemption may be enrolled to help them to get to tertiary education.

STATEMENT 19: I have changed my teaching methods to suit the ECPs.

Conclusions: 74% of the respondents say that they have changed their teaching methods to accommodate the ECP students. It can be concluded here that the lecturers have put all possible resources to help the ECPs. **Recommendations;** It is recommended that more assistance in terms of training and skilling be provided to the lecturers in that programme to boost their morale and increase the pass rate.

STATEMENT 20: I take the same time teaching the same material for both groups

Conclusion: The respondents' position is that they do not take the same time and do not teach the same material to the two groups running currently. It is concluded herewith that 68% of respondents who claim that they do not teach the same material are speaking from their experience in the classrooms. **Recommendation:** It is recommended that a close look be made to see the difference in terms of knowledge acquired by the different groups and how it compares since they will get the same qualification at the end.

STATEMENTS 21-25, STUDENTS RESULTS QUALITY

After all the teaching and somewhere along the way the two groups become one or have certain subjects in common. The survey therefore sought to get the information from the lecturers since they are dealing with these students as one class at a certain stage. This section therefore required the lecturers to make their own impressions about the quality of the ECPs knowledge contrasted to that of the mainstream.

STATEMENT 21: Mainstream students always outperform the ECP students in results

Conclusion: With 63% of the lecturers stating that the mainstream students do not necessarily outperform the ECPs, it can be concluded that the ability of a student to perform may be a function of the student's environment. This would explain why these students would be able to perform in a friendlier and well-resourced tertiary institution. **Recommendations:** It is hereby recommended that both government and the universities consider a plan to increase the number of students qualifying to get into tertiary. It is estimated that only 10% of the matric students enter university because of the failure to get matric exemption.

STATEMENT 22: You can tell from the marked scripts an ex-ECP from a Mainstream

Conclusion: It is interesting to note that there is a tie between the neutral (44%) and those disagreeing (44%) on an issue perceived as easy to evaluate. It can be concluded here that it is not exactly clear who comes from what stream hence the high ambivalence. This also means that one cannot distinguish from their performance when they are in the same class writing the same exam. **Recommendations:** It is recommended that the ECP should be seen as a panacea for the many students lay out because they do not have matric exemption. The government should expand on this program as it is evidently the alleviant for the black masses failing to enter university because of matric exemption.

STATEMENT 24: ECPs were well groomed so they perform better than mainstream

Conclusion: At least 50% of the respondents assert that the reason for the excellent performance by the ECP students is because they receive expect tuition not offered to the mainstream. The indifferent are at 33% which is itself too high for comfort. It can

therefore be concluded that the best method to teach all the students in these departments is the one used to teach the ECP students. **Recommendations:** It would immensely increase the knowledge base of the graduates if an effective method like those used on the ECPs becomes the norm.

STATEMENT 25: Performance depends on student's individual effort not on the stream

Conclusion: For all we know, apart from good teaching, the student still has to allow for learning to take place. 55% agrees that individual effort is critical for effective learning. **Recommendations:** Effort should be put across the board to encourage students and motivate them to contribute to their own learning process and not depend on lecturers.

STATEMENTS 26-30, WHAT DRIVES STUDENTS TO PASS

Many theories have been advanced around what motivates students to pass, and no single answer will fit all considering the diverse nature of people. The South African context brings with it its own complexities, the legacy of apartheid which appears to be here to stay for a while longer. There hasn't been a meaningful transition to push for radical changes in education, with specific emphasis in maths and sciences. There are very few black role models in the communities, if ever they are, to be a motivating factor for blacks to advance in sciences. Most of these learners may be first generation tertiary education candidates in their families, considering (as alluded to earlier) that 57% of the South African populace does not have a matric certificate. It is in this same environment where others fail. There are many others that excel, thus creating the curiosity around the drivers leading some of these ECP students.

STATEMENT 26: Beyond lecturing, a student plays a big role in their academic success

Conclusion: It can be concluded with that according to the findings, the lecturers (89%) actually believe that the student is largely responsible for the success or failure. The academics impart the knowledge, and the assimilation of that knowledge (the learning process) inevitably involves the willingness of the student to learn. **Recommendations:** Extensive student focussed programmes to motivate and encourage students and providing them with extra support will enable the students to go through their qualifications with comparative ease.

STATEMENT 27: The student's attitude towards studies determines their performance

Conclusion: It can be concluded that according to the findings (90%) that the student's attitude is supreme and is a critical factor in the success of the student as an individual and the programme as a whole. It was Martin Luther King (Jr) who stated: "Your attitude will determine your altitude." **Recommendations:** It is recommended here that any programmes (psychological or otherwise) known by the institution should be employed to enable the students to develop a positive attitude towards their studies in particular and life in general.

STATEMENT 28: Quality of students' performance is a direct result of quality lecturing

Conclusion: It is hereby concluded from the findings (63%) that the quality of lecturing, and indeed that of the education of the lecturers is a critical factor in producing quality students. **Recommendations:** It is hereby recommended that the university should design and provide subject-specific-knowledge development programmes scientifically designed to empower the lecturers. A highly motivated lecturing staff will "contaminate" the students with motivation and positive attitudes.

STATEMENT 29: Passing is 90% genius and 10% personal effort from the student

Conclusion: A large part of the respondents (74%) concluded that passing is not to do with genius largely thus 90% genius is rejected by the lecturers. It can therefore be concluded that success is more a result of effort than it is a result of genius. **Recommendations:** Programmes to motivate the students to put more effort practice more of their maths and sciences leaving nothing unattended to and never leaving for tomorrow what they can do today will enable the students to put adequate effort that will lead to success.

STATEMENT 30: Students would not pass if the lecturers were not that effective

Conclusion: It can be concluded that though the majority of lecturers (56%) agree that the quality of lecturers determine the pass rate of the students. Neutral stands at an unacceptable high of 39%, meaning that there is a large body of the academic staff that believe that passing is not a direct result of the quality of teaching. **Recommendations:**

The researcher has nothing to recommend on this issue except to insist on previous recommendations.

6.5 SECTION C

In this section three (3) open ended questions were put forward to the respondents to try to open up some discussions with the respondents. The respondents were also asked if there are any issues with the final ECP and mainstream products. Any other issues that were not covered by the survey that may have been deemed essential by the respondents were solicited for. Thus the respondents were requested to do specific tasks that relate to the study.

REQUEST 1: Identify key differences and similarities in the lecturing methods you use between ECPs and mainstream students.

Table 6.2: Similarities and differences in teaching methods

SIMILARITIES	DIFFERENCES
Same PowerPoint used for lecturing	More industrial site visits for the mainstream
Tutorials outside class for both	Tutorials done in and outside class in ECP
Spot tests used to keep them busy	Outside project exposure mainly for ECP
Course content is largely the same	Time on task longer for ECP students
They sit for the same examinations	Additional assistance
Lecturers' expectations the same	More opportunity to practice
Curriculum covered is the same	Cope and adjust better than mainstream
	More class time to go from the beginning of each concept to explain reasons of actual formulas or definitions

Source: own construction from survey

The table above indicates the similarities and differences between the different streams. Of particular interest is the fact that they cover the same curriculum, take the same examinations and are therefore expected to meet the same standards. That having been said, it is important to note that slightly more time and effort is focused on the ECP crop, possibly because they are treated as at risk group. It is encouraging to note that the ECP are considered to be able to "cope and adjust better than the mainstream. The researcher concludes that with special tuition (as shown above), more students could be enrolled.

REQUEST 2: Please state any other issues relating to the quality of the final ECP product from the stream on the basis of comparison between ECP and Mainstream products.

The respondents were requested to list any other matters arising from the survey form they had just filled in or any matters that may have been left out. The lecturers' response was enlightening in that there had been no such expectations, at least where they comment about the ECP students with praise. The responses are bulleted below;

- The student from the ECP final product has a deeper understanding of the subject compared to the mainstream student.

- In the mainstream it is extremely difficult to take students to industrial visits where students can see what they are being taught because of time schedules.

- It makes it easier for students to remember their theory if they can link it with the practical application in industry a practice beneficial to ECPs.

- There seems to be a lack of budget towards students' activities such as site visits and payment of extra tutors to facilitate effective learning.

- According to previous studies by other researchers, there is evidence that ECP students outperforming mainstream students

- ECP students get a better foundation because of the teaching methods applied which enable them ample time to study and assimilate what they are taught.

- The mainstream students do not get the attention necessary because they have many subjects and limited time to finish the coursework.

- ECP students who got up to the S3 level appear adjusted better to their studies compared to mainstream students who have limited time.

- Some ECP students struggle with the pace when they transfer to mainstream because of the heavy subject load at the initial stage but quickly adjust.

Conclusion: It can be concluded from the foregoing that the ECP is a critical panacea for the upgrading of deserving students with the intellect but disadvantaged by the high school system or the socio-economic structures which they find themselves in.

Recommendation: It is recommended that the institute commit to the development of a structure that will enable the students, both ECP and mainstream to have adequate exposure to industry and ample time to assimilate what they study. It is expected that this would produce a high caliber of engineering graduates that would foster the development of the much needed technical skills in the country.

REQUEST 3: Anything else you may want to say in relation to the information that you have provided, including what you think should have been included in such a survey.

The first assumption made here was that there was likelihood that some critical aspects of this survey may not have been covered since the researcher is not involved in the ECP processes. The second assumption was made that more heads are better than one; the lecturers would have a lot more to share than would have been included in the questionnaire. Hence the request for any information that would be of assistance to the research findings and future study opportunities. Some of the information provided in this section had already been covered and capture in the earlier Request 1, they are therefore not repeated here. Below are those statements that stood out and are hereby reported by the researcher, the lecturers said;

- The percentages of ECP to mainstream students would have shed a better light on the size of each department.

- Lecturers rarely check which students they have in their class; however those who perform well are indeed ECP students.

- The quality of the lecturer and the desire of the student to learn have a huge impact on the final result.

- The circumstances of a student, be it they social, economic, cultural or academic also play a critical role in the effort needed to produce the required graduate.

Conclusion: It can be concluded herewith that the commitment of the lecturer and the student work in unison to achieve a positive result. **Recommendation:** It is important for lecturers to communicate more with their students in order to establish a better understanding of their backgrounds.

REQUEST 4: Please indicate what you consider to be advantages of ECP

The respondents made the following remarks about the advantages of the ECP as a remedial imperative to assist those coming from resource-disadvantaged schools into the university system. The advantages were listed as;

- It provides a suitable option for students who are not strong academically
- The first and second semester subjects are spread over a two year period and have the same outcomes as the mainstream
- When the student integrates into the mainstream in the third semester their credits will be equal to that of a student who is on the mainstream

- The tutorial programmes are in place to help the student to be able to grasp the concept of the work being taught on a more individual level.

- The additional time that is used creates an opportunity for the students to be taught extra material therefore supplementing the syllabus.

- Moderation and test papers are constantly monitored by a mainstream lecturer to ensure the standards are equal.

Conclusion and recommendations: the absence of well-trained maths and science teachers in the school system is a cause for concern, and has been talked country wide and yet it appears to constantly evade the authorities, when these students, who, if they had been given adequate maths and science teaching, have failed matric, ECP becomes their only hope. As indicated by the findings of the ECP practitioners, the programme is working and it needs support.

REQUEST 5: Please indicate what you consider to be disadvantages of ECP

The academics identified disadvantages and these are listed below;

- Students are not put under enough pressure and it proves to be a problem in the transition into the third semester.

- The students need to be exposed to more realistic conditions that they would experience in the workplace so that they can be better prepared mentally.

- The amount of students that enter the ECP does not complement the amount of students that are graduating.

- Students in general are finding that the programme is too long and boredom is a problem

Conclusion and recommendation: A support programme for the students is critical as in most cases the students come from a disadvantaged background which can lead to outside problems that may affect them emotionally. The transition from school to tertiary level can be daunting, therefore the success of the ECP will depend entirely on the support programmes and guidelines set by the department as a whole. The ECP has become necessary due to the problems that the students are experiencing at school level.

REQUEST 6: Please indicate what you consider necessary to make the ECP successful.

Academics in the system know the problems they encounter since they teach the students and have direct access to all operational issues. Some of the suggestions that stood out for them were the following;

- ECP is treated as "low grade" in the system and that gives the impression of low quality of lecturers who are involved in the system.

- ECP enrolment should be increased and more people recruited because there is great hope for many disadvantaged students to do engineering.

- All mainstream lecturers should lecture ECPs to enable them to understand and facilitate the transition when these groups are combined at second year level.

Conclusion and recommendation: If all lecturers lectured the ECPS using the current methods, they may be encouraged to adopt the same methods for the other classes. Besides, that would assist in removing the barrier created by the sense of superiority over who lectures at what level and in which stream. If the ECP innovation is working well, it may be necessary to include many more other students that are left out because of poor performance at matric level.

6.6 QUALITATIVE RESEARCH SECTION

This section was interaction with the respondents after the questionnaire had been completed, thus informal meetings with the ECP lecturers was conducted. This followed on the basis of the open ended questions which had been filled in as required by the questionnaires. The following is the report on the last informal interviews which were not recorded on the questionnaire.

THE OPEN ENDED QUESTIONS - Qualitative Analysis

The last part of the questionnaire specifically wanted to measure and understand the feelings, opinions, and any other information from the participants. Not all of the participants were available for this section, but 12 of the total responding for the initial part of the research tool agreed on extra sessions. At these sessions, questions (open ended questions) were asked and this enabled the researcher to capture some thoughts. Deliberately another 12 students towards the completion of their studies (diploma and degree) were interviewed. The view was that they would be able to shed light on how they experienced the learning process having passed through both ECP

and Mainstream. The questions asked are listed below and the answers are provided herewith in sections since most people repeated each other, albeit differently.

1. How does the transition of a student from ECP to Main stream affect the learning system of the student?

Different assertions were made by the different respondents, but these were summarized to mean essentially the same thing. Because the respondents were not put together (but dealt with as individuals), the similar assertions were considered to be fact. These were thus recorded and details of these assertions are listed in table 1.1. below

Table 1.1

Pace of learning;	The pace at which the students learnt was initially worrisome, it was not known exactly why. Since these students were initially declared unfit for university, the first thought therefore was that their poor performance had more to do with their "intellect." All the same all the lecturers expressed concern on the first experiences with these students.
Feeling of intimidation	The respondents cited the "withdrawal syndrome" in the initial stages of the schooling with many of them talking very little in class. The respondents are of the opinion that there was a general feeling of "an intimidated" students possibly not sure of what to be and how to be. A few respondents cited "cognitive dissonance" as these students did not know who to be seeing that they came from school to college environments.
Time needed to adjust	There was also a general feeling that much was not done to "induct" them into the higher learning environment. Possibly the "notion" of them getting educated and meeting "highly educated" people for the first time. Some respondents cited the cultural shift specifically for those who had come from country schools and were in the city for the first time. Some had never been taught or even been in an environment where they mixed with whites, coloureds and Indians, thus adjusting was a problem.
Struggling to adjust	The struggle to adjust was primarily believed to have been a result of new uncertainties, and psychological reconditioning of oneself. But the institutions show ill preparation in the preparation to meet these ECP students. Possibly hurriedly taken up because of the money the government offered which would provide ready fees in universities affected by the fees must fall movement. It was also opined that those coming from poor underdeveloped parts of the country struggled most to adjust.

There was also mention of cultural shock as a form of disorientation that the students experienced when they were suddenly confronted with unfamiliar culture, language, way of life, and the attitudes.

2. How does the change of student to mainstream impact on your lecturing in terms of ability to understand?

A good number of the lecturers lectured to both ECP and Mainstream simultaneously, but there was the set of lecturers who lectured to mainstream only. It was thought important to evaluate the extent to which the lecturers could identify whether or not the student (one both meet in mainstream) could be distinguished as having come from the ECP group. The respondents provided this information as recorded in table 2.1 below.

Eventual settlement	The lecturers agreed unanimously that the students will eventually settle, and that the time taken to settle would depend on individuals. It was indicated that some of the personalities were just introversive, and this made it difficult to differentiate fearing from reserved. It was postulated that by the time 6 months passes, most of these students are outspoken and mingle freely with students from other streams and or classes, generally this would be after their first semester exams, if they have passed.
More questions are asked	The last part of the first semester saw increased participation by the students, asking questions and suggesting answers to those questions. This was attributed partly to "adjustment" and the gradual diminishing of cultural shock, as they acclimatize to the new environment. The questions asked were considered to be at the same level with those asked by students from the mainstream – suggesting there wasn't much difference in the ability to learn in those particular modules.
Can be disruptive to main stream students	Some respondents felt that there was a degree of disruption when these two groups eventually come to be in the same class. The structure of the course provided for more teaching time to the ECP students compared to the mainstream. The respondents' perceptions about the disruption and demand for slow pace from the ECP is due to the sudden addition of more modules per semester (mainstream) compared to the first 2 years in the system when they carry half-loads.

The respondents felt that there was little difference except that the teaching methods and pace used for the ECP treated them more as "at risk" students. The general feeling however was that, whilst they experienced unexpected pressure when they joined the mainstream – there was quick adjustments since all the students at that level were doing the same courses.

3. How do you compare the ability of an ECP student to that of a main stream student when they are integrated into the mainstream?

ECP take longer to grasp a concept	Respondents noticed that most students from the ECP group tended to take long to understand certain concepts. They attributed this to many factors, amongst which are; the very reason for which they could not qualify directly into the system, they are overwhelmed with doing more subjects and try to work round to perform well in all the subjects. Together with this was stated the change in the teaching approach which may impact

	negatively to the ECP as they are used to a particular format.
Take more pride in the work	An observation reported by most of the respondents, albeit expressed differently was that the ECP students take pride in their work, they are generally more scrupulous, and are perfectionists. It was highlighted that the questions they ask speak more to them wanting to be quality conscious and delivering in time. Some respondents referred to them as too sensitive about their work and they keep on checking with the lecturers at "every turn."
They ask more questions	It was stated times without number that ECPs ask more questions than the mainstream students. The type of questions were referred to as "logical and relevant questions." It was assumed by the respondents that the questions they ask are indicative of people keen to know, who studied ahead of the lecturers. Suggesting that mainstream students are "laid back somewhat." Those who ask more questions seem to be excelling in their academic results, sometimes surpassing the mainstream students.
ECP students tend to help other students when doing lab work	These tend to assist other students who may be struggling, especially with practical work (laboratory work). The general feeling was that they are more or better hands-on than the mainstream students. In response to the question – why? The respondents felt that there were myriads of causes, chief among them are that the first two years of their training they spend large amounts of their time doing practical work's. They seem to be regularly taken to the industry and thus they know much of the applications.
Are more prepared in theory and practical work	They appear to be (ECPs) to be more prepared in both theory and practical work compared to the mainstream. As to why, the respondents feel that the teaching methods in the ECP stages encourages self reliance on the part of the students. This is therefore carried over to the mainstream, and it is also suspected that they strive harder realizing that they were not supposed to have been in the system in the first step. Other respondents pointed out that these were classified as "at risk" students, thus the foundation they were provided with is firm and teaches them to work hard or dropout.

The performance of the ECP students when they join the mainstream is somewhat impressive, considering that they started as at risk students. Many factors can be attributed to this, among whom can be; they know they are considered at risk – so they work hard, the matric system is not a foolproof evidence of a student to perform in higher education, and the fact they had a good "grounding" in the initial years may have created a new character of hard workers in them.

4. What do you think should be done to create a better environment for effective learning when ECP students are integrated into the mainstream?

The ECP lecturers are the frontline operatives in this program and experience firsthand what is required or not necessary in lecturing to these ECPs. These lecturers may have developed lecturing techniques suitable for their learning systems since they start with the students at a more critical time. Some of the sub-themes emanating from the survey are tabulated below.

The lecturers should have taught them on ECP	A suggestion was made by numerous respondents that it would be preferred that the lecturer that the ECPs meet in the mainstream, should be the same that taught them in the lower classes. To a follow up question why – the respondents were adamant that these students would develop bonds with the lecturers since they spend long periods with them in the lower classes. There is general understanding between the lecturer and the students.
The ECP students should be prepared for the faster pace	There is need to prepare ECP students for the mainstream in that there will be a heavier load (more modules) when these enter the mainstream. It was also suggested that instead of giving them half the load offered to the mainstream, these workload be increased to ¾ to reduce the shock when they have double their traditional load in the mainstream. Some suggestions were that the lecturing pattern (individualized attention and long hours with the students) be continued until they complete their studies.
ECP students should be allow to be split into groups to get a feel of being separated	It is suggested that the ECPs become so close together and tend to support each other. When at a later stage (in mainstream) they are left to work as individuals, some do get affected. Hence the suggestion that they should be made to know and experience what it means to work alone when they get to the mainstream. It is suggested that they depend on each other so much such that their group mates become indispensable.
Extra classes should be made available in the beginning	When they join the mainstream, they should be provided with extra periods to assist them go through their studies. This is meant to assist them with getting to "catch up" and "pace up" to the same level with the mainstream classes.
Begin slowly and pick up the pace gradually	These should not be rushed as they need to adjust to the new study loads which may be taxing to them. Starting with them slowly and allowing them to have ample time to adjust to heavier loads may enable them to adjust and meet the mainstream standards. There was no doubt expressed about their intellect, but emphasis was on adjusting to the pressurized study.

It is scientific that the environment that an individual learns it impacts to a degree the performance of the student concerned. Cognizance is made of the fact the learners though may be affected differently in the same environment. Some have more endurance and tolerance than the others; hence students pull out / drop out of learning

institutions, in all kinds of environments. It is however expected that the lecturers are not psychologists nor are they social workers. Their focus will be on delivering / unloading the knowledge to the students and not attending to personalized expectations of the students.

5. How has the ECP system helped bring back into education those students that otherwise would have been lost?

It has allowed the students the opportunity to study	The ECP is well thought program, recognizing that the failure of students may not always have to do with the inability of the students to learn – intellect. Many students come from environments that are not conducive to learning, and thus their poor performance at matric may have more to do with absence of adequate facilities. Most rural students walk tens of kilometers to reach the school, learn under trees and other unbearable conditions – this would impact on their learning. Such students are allowed a second opportunity of education by the ECP system
Increases the students confidence to move forward in their studies	The ECP student is generally perceived as a lost case, and that they may not be able to go further with education. But giving them the second opportunity that too in an institution of higher learning, it makes them proud of themselves and that might generate more determination and self-confidence. It may be also that the environment of other students (age mates) succeeding may invoke self-confidence and determination to be like their peers.
Increases the amount of students at enrolment	Many of the respondents felt that the ECP gives students the opportunity to enter a tertiary institution, whereas before they would not have been accepted. The ECP operates as a separate entity therefore allowing extra students into first year which will not affect the general intake of the university. Therefore allowing more students to enroll.
It gives the opportunity for students to prove their abilities	The ECP is a semester course spread over a period of one year. The respondents mention that this allows the student the opportunity to improve their skills and for concepts to be explained more thoroughly. The extra time also allows the student to settle down easier, as the transition from high school to tertiary can affect their confidence levels. This was evident in almost all the first year enrolments, whether on mainstream or ECP
It opens doors to tertiary education	The respondents agreed that the ECP presents an opportunity to students whose marks allow them to enter the ECP. It must be noted that there is still a minimum requirement to get into the ECP.

The transition of ECP to Mainstream can present its own set of problems. The students coping mechanism is tested to the full. The amount of time the student

takes to settle into the fast paced environment of the Mainstream will determine their success or failure.

6. Can you distinguish at the 3rd year level any difference between the performance of ECP and Mainstream students?

The ECP students take more pride in their work	The majority of the respondents agree that ECP students are more conscientious about the work that they do as they tend to ask more questions to consolidate what they have been required to produce.
Are more detailed in their answering of questions	There is not much of a difference when questions are being asked in the classroom. The only difference is that an ECP student might ask a question to confirm that they are on the right track.
Take a little longer to grasp a concept	It takes a while for an ECP student to settle into the Mainstream environment as they are used to the speed of ECP. However in time they do settle in to the course.
Have a better grounding	The ECP students' practical skills are higher than that of the Mainstream as they have had more time to get used to the equipment and are more efficient when it comes to the recording of results. The respondents did note that in the theory component there is no difference as the students were taught the same material.
Are more responsible in completing tasks	The ECPs have a reputation of completing their tasks on time and are also more comprehensive when compiling their data. They (ECPs) also ask questions when they are unsure of a concept.

Universities have a specific admissions requirement which the prospective student needs to comply with. This has been put in place to allow students with the basic capabilities the opportunity to study at a tertiary institution. The exclusion of students who do not meet these requirements need to enroll in a FET college or any other institution to allow them to improve their skill and marks which will improve their chances and success rate of having a future at tertiary level.

7. What is your opinion in terms of the process used to admit students into the universities considering that some ECP students perform well?

The students must have mathematics as a background	The respondents agreed that a mathematical background is crucial to the students success rate. Most universities use mathematics as a bench mark
Must meet the minimum requirement	The respondents felt that meeting the minimum requirement can lead to future problems as the student progresses. The ECP would try and improve on the

	problem areas and strengthen the students capabilities, however it is the responsibility of the student to take advantage of the opportunity.
Must want to be on the course	In most cases the name of the course attracts students' which is sometimes not in the best interest of the student; however the respondents noted that the student who wants to be there will perform at their best of their abilities.
Must have the ability to problem solve	The respondents emphasized that if the student cannot problem solve they are going to struggle in the engineering environment. It would also improve their study techniques.
Must be practically minded	The students who are practically minded excel when it comes to problem solving, however the respondents mention that to be theoretically minded can also lead to the solving of everyday issues.

8. **What is the proportion of the number of students from ECP performing well compared to those from the Mainstream?**

In the beginning the Main stream outperform the ECP students	The ECP students do tend to take longer to adjust to the fast pace of the mainstream. Over time they do adjust and settle in to the regime.
Towards the end the ECP students do much better	The respondents did not notice a difference in the performances of the students. The main reason being that the work done is the same for both sets of students. The only noticeable difference is that the ECP students will be more comprehensive in their ability to answer questions.
Time improves confidence	The respondents were in full agreement that the more time taken can only increase the confidence of a student as problems and concepts can be scrutinized at a slower pace thus getting to more comprehensive solution

9. **What do you perceive to be the best solution to address the processes of admission considering that some pupils doing badly in Matric did very well at university level?**

An entrance test would help	All universities should introduce an entrance test as it will reveal the students capabilities and if they are applying for the correct course of study
Testing skills rather than academic ability	The testing of skills can also determine the students capability to problem solve, this could give the student the potential to do well academically
Use an entrance test as a bench mark	The students results could determine whether they are ready for the step from school to tertiary. The institution would also benefit as they would be taking in students who will be able to use their abilities to move forward in their tertiary career.

10. **What learning related problems have you experienced from ECP students when they get integrated into the mainstream?**

They struggle with the pace	The ECP students do struggle in the beginning, however as time passes they do improve.
They get left behind the practical work as the time is less	The first practical is always a determining factor on how the ECP student copes with the time constraints. The student realises that time is not on their side and most make the adjustment quite easily.
Feel intimidated by the different environment	The transition from ECP to mainstream can be overwhelming in the beginning. It is up to the student on how they are going to make the situation work for them.

11. **What difference in terms of effort is there between what you have to do for ECP students compared to mainstream students.**

Answer more questions	ECP students do tend to ask more questions, which show that they are trying to understand the work. Mainstream students on most occasions will discuss a problem amongst themselves or will approach the lecturer out of the classroom.
Spend more time with the student after class	The amount of time spent is spread equally with the students. Problems arise that students might not grasp and it is not necessary to separate the students if they are having the same issues.
Explain a concept more than once	The students whether they are ECP or mainstream will need an explanation of a problem or concept more than once. It is common knowledge that a statement always has to be repeated in the classroom before the student grasps the concept.

12. **Are there any issues you would want to say about the ECP / Mainstream students and the processes involved.**

The ECP students need to be taught by Main stream lecturers to get used to the pace	It is vitally important that an ECP student be taught by a Mainstream lecturer in order to make the transition into mainstream easier for the student as they are familiar with the lecturer. The lecturer then has a feel for what they can expect from the student in the classroom.
ECP students and Main stream students should be involved in combined activities in order to make the transition less stressful	This statement could not be more accurate as this will decrease the intimidation factor that the ECP student will feel once they have made the transition.
The last few weeks of ECP should be taught at mainstream pace for a	An ECP student needs to be nurtured as their confidence is at a high level as they realize their capabilities. Everything must be done to ensure a

better transition to take place	smooth transition so that the student does not get lost in the system.
ECP lecturers should make themselves available to help students that are struggling in order to give them the confidence needed to move forward	ECP lecturers find themselves in the position of always having the best interests of their students at heart. They must be on call until the student finds their way and is able to cope on their own. The student feels more comfortable knowing that there is an open door policy in place.

6.7 LIMITATIONS OF THE STUDY

A number of limitations have been identified, and these may either be revisited or other researchers may decide to explore them. The limitations to the study are listed briefly as;

1. The study was focused mainly on one institution which may have accepted a particular demography different from other aspects of the country.

2. The number of respondents who took part could have been increased if more institutions were involved in the survey.

3. Not all sections of the questionnaires were filled in as other respondents omitted certain sections.

4. Time was also a factor as many of the respondents took time to complete the questionnaires and return them.

6.7 GOVERNMENT POLICY ON ECP AND STANDING

According to the Report of the Ministerial Committee for the Review of the Funding of Universities (2013:95) 'The Higher Education Act (No. 101 of 1997) makes provision for the funding of higher education (Chapter 5 of the Act). The Act outlines that the intentions of government with regard to higher education, include the following:

- The redress of past discrimination.

- Ensuring representativeness and equal access.

- Providing optimal opportunities for learning and the creation of knowledge.

- Promoting the values that underpin an open and democratic society based on: dignity; equality; freedom; respect for academic freedom; the pursuit of excellence; the promotion of the potential of every student; and appreciation for diversity.'

Funding therefore has been put into place for ECPs and should be used at all tertiary institutions, as stated before this will improve the student intake and give opportunities to those students who would not have been allowed to study at a tertiary institution. It

must be noted that with all these opportunities that the students now have there are minimum NSC requirements that are needed to enter a tertiary institutions stipulated in Government policy. The diploma for ECP and Mainstream are the same. There is no difference between the syllabuses of the two departments. The only difference is the time taken to complete the course. Students are often under the misconception that being on the ECP is being at a lower standard. The ECP has been put in place to help students and give them an equal opportunity in the work place. The students need to be made aware that the ECP should be looked upon as an opportunity to study at a tertiary institution and not a hindrance to further their studies.With the government allocating funding to the universities and recognising the fact that there is a problem it has made the task easier for the universities to implement the programme; however it must still be noted that the student has to meet the minimum requirements to be allowed entry into the institution.

6.8 SUMMARY OF THE FINDINGS OF THE STUDY (Closing conclusion)

The aim of the study was initially to determine the quality of the graduates coming through as ECPs compared to the mainstream students. The primary motivations were because ECP students are matric borderline students who have failed to get matric exemption. The South African traditional education system has it that a matric exemption certificate is the recognised entry requirement to university education. Traditionally therefore, borderline cases have been treated as failures and would not qualify or were considered ill prepared for university education. The research results here prove otherwise, that ECP students are not necessary intellectually incapable of doing and passing university degrees. The findings indicate that the ECPs are equally able, and in many instances, outperform the mainstream students who may have passed matric with exemption. These issues need to be addressed in order for the student graduation rate to increase. It is important that the Mainstream and ECP work together to overcome obstacles that may occur in the delivery of the curriculum as the final outcome has to be the same, meaning that both departments write the same exam. Research has indicated clearly that there is no marked distinction between ECP and mainstream students once they are in combined classes. This clearly indicates that the quality of these students and the qualification is of a higher standard. The objectives of the study have been met.

REFERENCES

- Abdelsalam, H. M. E. & Gad, M. M. 2009. *International Journal of Project Management, Volume 27(5),* pp.501-511

- Abdi A, Puplampu K.P, Sefa&Dei G.J 2006 African Education and Globalization: Critical Perspectives

- Agile Project Management. 2015.
  http://www.tutorialspoint.com/management_concepts/agile_project_management.htm
  [30th September 2015]

- Ali, M & Shastri, R.K. 2010.*Implementation of Total Quality Management in Higher Education*
  http://maxwellsci.com/print/ajbm/v2-9-16.pdf
  Journal Asian Journal of Business Management 2(1): 9-16, 2010
  [30th September 2015]

- Archer V, 2012. ECP Strategic Management Guide

- Bargiela-Chiappini F & Kádár D.Z. 2003. Politeness Across Cultures

- Bozalek, V., Garraway, J. and McKenna, S., 2011. Case studies of epistemological access in foundation/extended curriculum programme studies in South Africa.

- Burke, R., 2007. Project Management Techniques: College Edition. *Published in.*

- Cantrell, MA Kouwenhoven, W Mokoena, T& Thijs, G - 1993 - Amsterdam: VU Press

- CHE. 2013. *Report of the Task Team on Undergraduate Curriculum Structure*
  http://www.che.ac.za/sites/default/files/publications/Full_Report.pdf
  [5th October 2015]

- CPUT 2014.*Extended Curriculum Programme explained*
  https://www.cput.ac.za/newsroom/news/article/2646/extended-curriculum-programme-explained
  [13th April 2016]

- Dr Sola Aina & Oyeyemi Kayode. 2012. *Application of Total Quality Management in the Classroom,* Vol.11 No. I
  http://www.bjournal.co.uk/paper/BJASS_11_1/BJASS_11_01_02.pdf
  [3rd October 2015]

- Farzana Hussain.2011. *The implementation of total quality management at a tertiary education institution*
  http://dspace.nwu.ac.za/bitstream/handle/10394/7363/Hussain_F.pdf?sequence2
  [3rd October 2015]

- Field, M. & Keller., L. 2000. Project Management. London; Thomson Learning

- Fleisch, B. 2008. Primary Education in Crisis: Why South African Schoolchildren Underachieve ...

- Geoff Petty. 2014. *Improve your teaching and that of your team*
  http://geoffpetty.com/
  [September 24 2014]

- Grobler, P.A., Wärnich, S., Carrell, M.R., Elbert, N.F. & Hatfield, R.D. (2006) *Human Resource Management in South Africa.* 3rd ed. London, Thomson Learning

- HELTASA. (n.d). *Success stories in Foundation/Extended Programme. pg. 24*
  http://www.cput.ac.za/blogs/ecp/files/2015/02/Final_Success-Stories.pdf
  [4th October 2015]

- Hutchings, C. and Garraway, J., 2010. Beyond the university gates: Provision of extended curriculum programmes in South Africa.

- James Garraway 2015. *Changes in CPUT Guidelines for Extended Curriculum Programmes for approval by the STLC.*
  http://www.cput.ac.za/blogs/ecp/files/2015/02/CPUT-guidelines-2015-jan.pdf
  [6th May 2016]

- Jill Adler & Yvonne Reed 2002. *Challenges of teacher development. An investigation of take – up in South Africa*
  http://libarch.nmu.org.ua/bitstream/handle/GenofondUA/4875/2d66209375337fb33c23cdbe6e008e4b.pdf?sequence=1#page=30
   [2ndNovember 2017]

- John Creswell 2008. *Mixed Methods Research: Design and Procedures:*
  www.up.ac.za/.../mixed-methods-research_-design-and-procedures_-by-john-w-creswell.zp37294.ppt&usg=AFQjCNGx1Q9HqwZqc5BhgDjm-lgoUcgHuQ&bvm=bv.128153897,d.bGs
  [26th July 2016]

- Mabila, T.E, Malatje, S.E, Addo-Bediako, A, Kazeni, M.M.M, &Mathabatha S.S2006.*The role of foundation programmes in science education. The UNIFY programme at the university of Limpopo*

https://www.deepdyve.com/lp/elsevier/the-role-of-foundation-programmes-in-science-education-the-unify-3eDthShgip

[2nd November 2017]

- Mantel, Jr. S.J. Meredith, J.R. Shafer, S.M. & Sutton, M.M. 2001. Project Management in Practice. New York; John Wiley & Sons, Inc.

- Mantel, Jr. S.J. Meredith, J.R. Shafer, S.M. & Sutton, M.M. 2005. Core Concepts Project Management in Practice 2nd edition. New York; John Wiley & Sons, Inc.

- Martin, P. and Tate, K., 2002. *Getting started in project management* (Vol. 51). John Wiley & Sons.

- Nelson Mandela Metropolitan University 2015**.** *WHAT IS AN EXTENDED CURRICULUM PROGRAMME?* https://www.nmmu.ac.za/Apply/Frequently-asked-questions/Study-@-NMMU/What-is-an-extended-curriculum-programme-#FAQLink891

[29th April 2016]

- Pauline Machika 2013.*Access and success must be revisited* http://mg.co.za/article/2013-03-18-access-and-success-must-be-revisited

[29th February 2016)

- Pinkerton, W. J. 2003. Project Management. Achieving Project Bottom- Line Succe$$. New York; McGraw-Hill

- Quality Digest. 2011. *Definition of Quality* http://www.qualitydigest.com/magazine/2001/nov/article/definition-quality.html#

[29th September 2015]

- Randal Wilson 2015. *Mastering Project Time Management, Cost Control and Quality Management: Proven Methods for Controlling the Three Elements that Define Project Deliverables* http://www.ftpress.com/articles/article.aspx?p=2344987&seqNum=3

[13 April 2016]

- Schwalbe, K. 2006. Introduction to Project Management. Boston Massachusetts; Thomson Course Technology

- Summers, D. C. S. 2009. Quality Management. Creating and Sustaining Organizational Effectiveness 2nd edition. New Jersey; Pearson International Edition

- Tinnirello, P.C 2002. New Directions in Project Management. Florida, Auerbach Publications
- Trochim, W .2006*. Ethics in research*
- http://www.socialresearchmethods.net/kb/ethics.php
- [11th October 2015]
- Tutorials point simple easy learning 2014. Project Management Triangle
  http://www.tutorialspoint.com/management_concepts/project_management_triangle.htm
  [September 27 2014]
- Vekeataraman. R. R. Pinto J. K. 2008. Cost and Value Management in Projects. New Jersey; John Wiley & Sons, Inc.
- Wasserman, H. 2015 Press Freedom in Africa: Comparative perspectives

APPENDIX A
QUESTIONNAIRE

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The effectiveness of the extended curriculum programme in the electrical engineering department at a university of technology in the Western Cape, South Africa
Dear respondent; I kindly request you to participate in this research project under these conditions; your are not compelled to participate, its voluntary. You can withdraw at any stage if you feel uncomfortable about anything. None of this document will be ascribed directly to you, your identity is protected, please do not put your name or marking that might identify you.

SECTION A - BIOGRAPHY
Please cross the applicable boxes

1. What is your position in the organisation?

HOD	SENIOR LECTURER	LECTURER	OTHER

2. Other – please specify ………………………………………………………..

3. **What department do you work for?**

Electrical engineering	Mechanical engineering	Civil engineering	Other

4. Other – please specify …………………………………………………………………

5. Are you involved in ECP lecturing?

Yes, I am	I used to be	No, I am not	Other

6. Other, please specify …………………………………………………………………

7. How long have you been involved in ECP projects?

Under 1year	Just over 1 year	2 years +	Never been

8. Do you lecture any other classes / levels in your subject?

Exclusively ECP subjects	Exclusively mainstream	Both ECP and mainstream	Don't lecture any

9. Anything you would want to say about lecturing in the ECPs, please state below

- ✓ ………………………………………………………………………………
- ✓ ………………………………………………………………………………
- ✓ ………………………………………………………………………………
- ✓ ………………………………………………………………………………
- ✓ ………………………………………………………………………………
- ✓ ………………………………………………………………………………

SECTION B;

Please rank the Likert scale below using measurements as provided; strongly agree = 1, agree = 2, neutral = 3, disagree = 4, and strongly disagree = 5.

		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	KNOWLEDGE ABOUT STUDENT CALIBER	1	2	3	4	5
1	All the ECP students in my classes are black students	1	2	3	4	5
2	There are more coloureds than whites [students] in the ECP	1	2	3	4	5
3	There are more females than males [students] in the ECP	1	2	3	4	5
4	The ECP students are predominantly from outside Cape Town	1	2	3	4	5
5	I am not sure about the origins of these ECP students I teach	1	2	3	4	5
	LEVEL OF ADJUSTMENT TO TERTIARY EDUCATION					
6	Mainstream students adjust faster right from the beginning	1	2	3	4	5
7	ECP students struggle more adjusting to the university lecturers	1	2	3	4	5
8	From the onset the ECPs don't have a grasp of the subject	1	2	3	4	5
9	The adjustment of the students is the same for all students	1	2	3	4	5
10	Adjustment is more an individual student matter	1	2	3	4	5
	SUBJECT CONTENT [practicals and theory]					
11	The subject course content is different between mainstream and ECP	1	2	3	4	5
12	Students write the same exam for the similar subjects they do	1	2	3	4	5
13	The difference is merely in the FEWER number of subjects by ECPs	1	2	3	4	5
14	ECPs are taught additional material to catch up with mainstream	1	2	3	4	5
15	ECPs are given more time than the mainstream students	1	2	3	4	5
	TIME TAKEN TEACHING					
16	Because ECPs are at risk we teach them more intensively than others	1	2	3	4	5
17	I put more care and time on ECPs because they are slow learners	1	2	3	4	5
18	Its strenuous to go through the work of ECPs, they take long to learn	1	2	3	4	5
19	I use different teaching methods for ECPs than for mainstream	1	2	3	4	5
20	I take the same time teaching the same material for both groups	1	2	3	4	5
	STUDENTS' RESULTS QUALITY					
21	Mainstream students always outperform the ECP students in results	1	2	3	4	5
22	You can tell from the marked scripts an ex-ECP from a mainstream	1	2	3	4	5

23	You cannot tell from the performance an ex-ECP from mainstream	1	2	3	4	5
24	ECPs were well groomed so they perform better than mainstream	1	2	3	4	5
25	Performance depends on student's individual effort not on the stream	1	2	3	4	5
	WHAT DRIVES STUDENTS TO PASS					
26	Beyond lecturing a student plays a big role in their academic success	1	2	3	4	5
27	The student's attitude towards studies determines their performance	1	2	3	4	5
28	Quality of students performance is a direct result of quality lecturing	1	2	3	4	5
29	Passing is 90% genius and 10% personal effort from the student	1	2	3	4	5
30	Students would not pass if the lecturers were not that effective	1	2	3	4	5

SECTION C;
Open ended questions
1. Identify key five [5] differences and similarities in the lecturing methods you use between ECPs and mainstream students – use table below

SIMILARITIES	DIFFERENCES

2. Please state any other issues relating to the quality of the final ECP product from the stream on the basis of comparison between ECP and Mainstream products.

- …………………………………………………………………………………………
- …………………………………………………………………………………………
- …………………………………………………………………………………………
- …………………………………………………………………………………………
- …………………………………………………………………………………………

3. Anything else you may want to say in relation to the information that you have provided, including what you think should have been included in such a survey.

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THANK YOU FOR PARTICIPATING