Success stories
in Foundation/Extended programme
INTRODUCTION

The Foundation Special Interest Group of HELTASA
James Garraway

SUCCESS STORIES IN FOUNDATION/EXTENDED PROGRAMMES

Access for success: Alternative admission for selected talented science degree students at the University of the Witwatersrand.
Daisy Matlou

University of KwaZulu-Natal, Faculty of Science and Agriculture: The Centre for Science Access
Joseph Kioko

University of the Western Cape EMS Foundation Programme: Analysing its success.
R.G. Arendse

Promoting Access and Success at Stellenbosch University’s Faculty of Health Sciences
Gert Young

A Pharmacy Foundation Programme Success Story at UPE/NMMU
Maritz Snyders
Foundation provision in Economics 1 at the University of Cape Town
Leonard Smith

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Carla Fourie

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Foundation programmes at Tshwane University of Technology: “a success story with a difference”.
Steven Painter

Success of foundation (extended programmes) in Engineering and Sciences at CPUT
James Garraway
INTRODUCTION

James Garraway

The idea to find and publish these ‘success’ narratives arose during a discussion between myself and Ian Scott. We felt that there was quite a lot written about foundation in terms of improved access for disadvantaged students and responsive curriculum innovation but less on actual quantitative measures of success. Though recognising that the former is critical in an unequal society, it was felt that it was also important to generate data which spoke the sort of language typical of university and Government planners. The purpose of the discussion thus turned to how to promote foundation at universities where senior management may doubt its effectiveness, and to help ensure continued financial support from Government for the foundation project as a whole.

The Success Stories Project was first discussed with a large group of university representatives at the Foundation Special Interest Group meeting at Rhodes University in December 2008. What should go into the stories, for example that the stories should include something about the intervention and success figures, and a timeline for the development of the booklet were planned. I had hoped that the call for success stories would get out to all the universities, as not all universities were represented at the meeting, but this did not happen. In addition, some staff were simply not able to get their stories in on time owing to busy workloads. Thus some significant stories are not included in the volume. It is hoped that those who are not represented in the current booklet can include their stories in a subsequent publication.

How success was measured differed in the different universities. Where programmes had been running for a long period in, for example, the Wits College of Science and their counterpart at UKZN, detailed data of graduation rates and possible reasons for success were documented. In other programmes, particularly the more recent ones, this data was not available. Instead comparisons were made on success in mainstream subjects between foundation and regular students.

Some of the authors went beyond the brief and gave detailed information of the Foundation Provision offered. Rather than asking authors to edit and shorten these documents, I thought that they provided useful information for all practitioners so this detail was left in (see, for example, the articles from Wits, Stellenbosch and UKZN). The result was that some authors have presented short, to the point success narratives and others longer, more detailed offerings. They both, however, serve the purpose of showcasing success.

While acknowledging that some narratives where foundation has not been so successful have not been shown, there is substantive evidence of the quantitative success of these interventions. Some authors have also detailed why they thought their interventions were so successful (see, for example, UKZN). More work still needs to be done on reasons for success so that universities can share and trial innovative teaching methodologies. But that is for a later volume of stories.

Thanks to all those writers who took time to research and distribute knowledge about their practices.

James Garraway, Foundation SIG Coordinator
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Access for success: Alternative admission for selected talented science degree students at the University of the Witwatersrand.

Daisy Matlou, WITS

THE BACHELOR OF SCIENCE 4-YEAR DEGREE PROGRAMME
The Faculty of Science at the University of the Witwatersrand, Johannesburg offers a Bachelor of Science (BSc) 4-year programme with the first two years of the degree being the foundation phase. The programme is an integral part of the Faculty of Science on the East campus. The staff and students of the BSc 4-year degree are full members of the University community. Students register in the Faculty of Science, use the same lecture and laboratory facilities and are taught by many of the same lecturers as on the 3 year BSc degree.

The aim of the programme
The BSc 4 – year programme aims to provide access to science studies to able, but underprepared students. The programme aims at building a firm foundation in scientific skills, knowledge and attitudes through innovative teaching and learning experiences. It strives to train independent, flexible graduates in science from students who would otherwise not have been able to study science at university.

Admission requirements
The BSc 4-year degree is offered to students who do not meet the minimum requirements for admission to the 3-year BSc degree. In terms of the University’s general rules, applicants to the programme must have a National Senior Certificate, Matriculation Exemption or qualify for Mature Age Exemption. In addition, admission to the programme is through successful performance in the selection tests.

The structure of the BSc 4-year degree programme
The programme started as a 2 plus 2 model with the first year of the BSc 4-year degree spread over two years, after which the students proceeded to the 2nd year of a Bachelor of Science degree. After restructuring, this foundation programme can now be described as a 1 plus 3 model which means that courses for the second part of the programme have been redesigned to be equivalent to the 1st year mainstream and that students attend these courses, write the same tests and examinations with their mainstream counterparts. The purpose of mainstreaming courses is to challenge students so that they are better equipped to deal with the second year mainstream. The programme offers both a fixed and semi-fixed curriculum of credit bearing courses which count 144 of the 396 points required to successfully complete a Bachelor of Science degree at Wits.

The Model of the BSc 4-year Degree programme
It will take four years to complete the degree.

1st year
1st year BSc
2nd year
2nd Year BSc
3rd Year BSc
Bsc 4-year degree programme foundation level courses

The programme courses are structured as follows:

<table>
<thead>
<tr>
<th>FIRST YEAR</th>
<th>SECOND YEAR</th>
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</thead>
<tbody>
<tr>
<td>Mathematical Sciences 1A (Math 1004)</td>
<td>Mathematics 1B major (Math 1005)</td>
</tr>
<tr>
<td>Chemistry 1A (Chem 1047)</td>
<td>Mathematics 1B ancillary (Math 1006)</td>
</tr>
<tr>
<td>Physics 1A (Phys 1022)</td>
<td>Chemistry IB major (Chem 1021)</td>
</tr>
<tr>
<td>Biological Sciences 1A (Biol 1010)</td>
<td>Physics 1B major (Phys 1005)</td>
</tr>
</tbody>
</table>

In the first year of the programme, all students study Mathematical Sciences 1A, Chemistry 1A, Physics 1A, and Biological Sciences 1A as described below. Students must pass the first level course of the programme in order to register and study for the second level courses.

In the second year of the programme, students have a number of choices to make depending on their needs and abilities. They can continue to study Mathematics 1B, Chemistry 1B, and Physics 1B at major or auxiliary level or Introductory Life Sciences 1 or add mainstream first year BSc course(s) to complete the first year of the BSc 4-Year degree programme. Students attend the second level courses of the programme, write the same tests and examinations with mainstream students.

The Math 1B course offers students an option of Math 1005 equivalent to mainstream Math 1000 major, or Math 1006 equivalent to the mainstream Ancillary Math 1010 course. In the case of Physics 1B, students are offered an option of Phys 1005 equivalent to the mainstream Physics 1000 major or Phys 1006 equivalent to the mainstream auxiliary Phys 1001 course. Chem 1B offer high achieving students an option of a major or a terminating course. These courses are mainstreamed and both BSc 4 year programme and mainstream students attend lectures and write same tests and examinations together.

PROBLEMS DISADVANTAGED STUDENTS ENCOUNTER

General problems
Language barrier: Many are not English first language speakers and in addition each subject has its own specific vocabulary which students have to cope with.
Content knowledge gap: Since these students did not do well at school in many or most of their subjects, they find their background knowledge to be deficient.

Transition from school to university: Students find the move from school to university difficult as most of them show maladjustment to university living and learning environment.
Problems with self confidence: They are unsure of themselves because they have not been exposed to technology; for example using computers.
Diversity issues: They are unaccustomed to interacting with racially mixed groups.

Lack of role models: Most seem to be first generation tertiary students without any role model to serve as mentor or provide guidance.

Financial difficulties: Most of the students come from the low income earning families and are unable to financial supplement the meager students financial aid received from government though the university.

Residential and transport problems: Wits was not designed to be a residential university and as such the demands for accommodation exceed supply thus leaving students with no comfortable places to study. For available accommodation, finance hinders access. Students are left to commute with long travelling hours and lack of finance to pay for transport. (Matlou, 2001).

Learning difficulties encountered by students in specific courses on the programme
Biol 1010: Biology involves a large quantity of facts and content and students struggle to cope with the volume of work. This is partially due to the fact that they do not work consistently. In addition they get left behind as the lecturer moves from concept to concept. Finally, if a student is to cope with a large volume of content this requires an ability to summarize and synthesize this information which these students are unable to do.

Students read over the content without understanding. This leads to superficial explanations as opposed to the deep learning that is expected.
Essays are an integral part of Biology and students are unable to write these coherently with sufficient detail and logic.

Chem. 1047/Chem. 1021: Most students have been taught a rote learning, superficial approach to chemistry at school and it comes as a shock to them when they see the depth of understanding required. They struggle with application of knowledge and representing content in different ways (for example, graphically, verbally and mathematically).

In examinations students often have problems interpreting questions and are unable to manage their time. It takes time for them to become accustomed to answering questions in the multiple choice format where so many of the possible choices seem attractive.

There are many topics where students experience difficulty such as the mole and the Avogadro constant. However, this problem is experienced by all chemistry students and not only those in the programme.

Math 1004/ Math 1005 / Math 1006: Many students come out of the schooling system with certain beliefs about mathematics that need to be changed to make them successful students of mathematics.
“Mathematics is not to be read.” Very often students’ attitude is that mathematics is a discipline to be “practiced” and not read. This is closely related to the common belief that “if you know how to do it, then you understand it”. This may come from the way mathematics is taught and assessed at school.

Proof and mathematical arguments: The art of proving assertions is unique to mathematics and logic, yet it is one of the most difficult skills to develop. The ability to present coherent arguments in mathematics has
always been a stubborn problem. It is worse now that Euclidean geometry has become optional in the school curriculum.

This used to be the only topic that introduced secondary school students to the art of proving statements. Developing this skill requires time, so it was useful to introduce it at school to give it a bit more time for its development.

In second year, students are still struggling with the higher order conceptual questions. They feel more confident with the rote type questions testing theory and work familiar to them from lectures and tutorials. Their performance in unseen work is still unsatisfactory. They also struggle to follow logical arguments or to present logical arguments. Their mathematical writing skills are still underdeveloped. There is also a general difficulty with graphical work, and with interpreting the language of application questions.

Physics 1022 / Phys 1005 / Phys 1006: At first year level, most of the students have difficulty in the understanding and application of new concepts like vectors; the concepts of \( \hat{i} \) and \( \hat{j} \) unit vectors is something that is new for them to grasp. Most of the units in the first semester require an application of the concepts of \( \hat{i} \) and \( \hat{j} \) unit vectors. This is especially true when it comes to the application of Newton’s laws of motion where students need to specify direction in vector notation.

At second year level, there are cases where students have difficulties in solving problems where an algorithm is unknown. They manage to find solutions if they have seen a “very similar” exercise before and mimic the solution.

In general these students find word problems most difficult such as interpretation of long questions with many details. They fail to conduct a satisfactory analysis in order to uncover the mathematical quantities and proper equations needed to solve these problems. Even simple mathematics rearranging of equations still seems to hinder the progress of students at all levels. Students often are unable to tell to which part of the syllabus a particular question is related.

**INTERVENTIONS**

**Biological Sciences**

Mainstream courses have large classes (over 300 students) and per week and involve several lectures, a practical and a small number of tutorials. This tends to result in limited time to master a range of skills necessary for success in any tertiary level course. At the outset the BSc 4 year programme opted for greater small group teaching in tutorial sessions where appropriate skills are taught and content is extensively re-enforced.

In the Biology course, for each week, students attend two double tutorial sessions, two to three lectures per week and one practical. The curriculum has structured tutorials that cover general skills, organizational skills, laboratory skills and writing skills. All skills are contextualized in the course content. General skills include time management, previewing and test and examination preparation. Organizational skills cover classification and arrangement of information in a hierarchical manner. Great emphasis is placed on writing skills for essays, laboratory and scientific reports and other written assignments. In addition, students are exposed to word processing skills during computer tutorials and have other tutorials based in the computer
laboratory. All these skills are progressively built up as preparation for the second and later mainstream years. With a good foundation in various competencies, the scaffolding may be gradually withdrawn. Students are assessed in a portfolio of tests, practical marks, assignments and examinations.

Amongst some of the Biology course’s strengths are, firstly, small group teaching that affords students time to assimilate skills and fosters peer interactions. It also allows the monitoring of student performance so that there may be follow-up and some form of intervention implemented. Further, the writing skills imparted to the students are used extensively in later years of study. Finally the varied knowledge mapping techniques suggested to them through the tutorial sessions are of value to the development of student’s depth of understanding and information retention. Over the years, the curriculum has been modified to accommodate the new student intake. In the future it will have to become more technological to firstly engage the learners and secondly keep pace with the advances in digital literacy. In conclusion we remain highly cognizant of all the ideas encapsulated in ‘being in the university’ (Clarence and McKenna, 2009) – the thinking, valuing, speaking, acting and reading and writing within the foundation programme leading to the mainstream courses.

**Chemistry**
A major thrust in overcoming student problems chemistry lies in the small group tutorial system. In these tutorials groups of up to 20 students engage in problem solving activities under the guidance of a specially trained tutor. As students get to know each other they are able to interact more freely and voice their opinions without fear of ridicule. They also get to trust the tutor and are able to discuss even personal problems.

The tutorials are varied with many hands-on activities which are not possible in the large tutorials in mainstream. For example Lewis diagrams and VSEPR theory are taught with models. Each student has the opportunity of using the models and they can even take them home if they want to clarify certain aspects. Using models helps students to get a feel for representing a molecule in 3 dimensions. The practical sessions are specially designed to encourage questioning while at the same time learning practical skills. Students are gradually introduced to writing good practical reports. There is an attempt to link theory and practice by doing the practical immediately after a topic has been covered.

With regard to assessment, students are taught techniques of coping with multiple choice questions by working through sets of these types of questions under the guidance of a tutor so they are able to analyze each of the distracters and select the correct response.

**Physics**
At the end of each unit students submit their solutions for all the problems for marking. This assists staff in identifying areas where difficulties are still experienced and solutions for the entire unit are then given to the students with their marked scripts. To ensure that students work regularly they write spot tests. Where problems are identified, students are invited for one-on-one tutoring. In tutorials students are given the maximum opportunity of practicing problems, engaging in open discussion forums and working both independently and in groups. Students also have the opportunity of attending additional tutorials, if they so wish.
Computer Aided Laboratories are available to students who have been identified as underachieving. This activity is driven by problem solving and conceptual understanding where students solve problems online and are assisted by tutors.

At second year level students on the BSc 4 year programme get extra help with exercise problems set for the week and are given assistance in getting started on the homework problems they have to hand in. This is done in a tutorial session held immediately after the tutorial for the whole class.

**Mathematical Sciences**

The introductory logic topics include methods of proof. With awareness that in the three weeks in which the elementary logic topics is dealt with, it is not possible to produce competent readers of mathematics. The aim is however to do enough to lay the foundation for the development of such competencies over time. To overcome the belief that mathematics is not to be read, students are introduced to basic topics in logic where set theory and logical connectives are touched on. These constitute the fundamentals of the language of mathematics, without which it is nearly impossible to read and write mathematics with understanding.

Lecture work is supplemented by weekly tutorials, in which students work in groups on specifically designed and presented questions. In addition to the classroom tutorials, the students also attend an online computer-centered tutorial on a weekly basis. The e-learning environment, called MyMathLab, enables every student to have access to an online set of notes, textbooks, tests, reading tasks and weekly homework assignments. Each week, homework is set based on that week’s lectures as well as on revision of pre-knowledge concepts. Students have to complete and submit this prescribed homework online on a weekly basis. They get immediate feedback with hints and support to rectify any misconceptions or incorrect answers. Their weekly progress is monitored via the online Grade-book which the course coordinator has access to. Two online tests are also written per semester as well as 2 compulsory assignments. All these marks form part of the continuous assessment mark. These students also write pen and paper tests towards the continuous assessment mark.

Overall, the major aim is to teach for independence of thought and learning and for students to become competent readers of mathematics who are capable of using the knowledge acquired to solve problems.

**Counselling**

The programme has a counsellor who provides overall support to students with matters pertaining to learning difficulties, personal and family problems, and career and curriculum issues. In some instances, students are referred to the relevant service providers.

**THE DESCRIPTION OF SUCCESS OF THE PROGRAMME**

Table 1, 3 and 4 give the actual figures of BSc 4 year programme student’s enrolment numbers and of graduates at both undergraduate and post graduate levels in Science and non-Science degrees. Table 2 provides the actual figures of BSc 3 year degree/mainstream undergraduate student’s enrolment and junior degrees. This is followed by a brief description of simple overview of the throughput rates of the two programmes namely the BSc 4 year and the BSc 3 year degree programmes.
Table 1: 1992 – 2005 BSc 4 year degree programme/Total Intake and Graduates

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Since inception, the programme has produced a total of 570 junior degrees that is over 50% of the total intake. It is important to note that the programme produces graduates in all subject areas including those frequently described as difficult such as Physics and pure Mathematical Sciences. However, the highest number of graduates from the programme is in the Biological Sciences (College of Science Review, 1999 – 2001).

From Table 1, it can be seen that from 1992 – 2005, a total of 1011 students were accepted into the BSc 4 year degree programme. It is evident that 50% of these students 502 in total successfully completed the Bachelor of Science degree. Although it is not recorded here, it should be noted that over half of these students completed the degree in minimum time and the remaining students took an average of 1.2 years longer to finish the degree.

From Table 2, it is also pleasing to note that during 1992 – 2005 of the total intake of 1011 a total of 178 students changed Faculty by registering for courses in other Faculties. This Faculty move produced additional 68 junior graduate degrees. Students’ move to other Faculties and graduation highlights the benefit of the programme even more. Students who moved Faculties did not qualify for admission in these Faculties used the programme as the stepping stone to build a solid foundation of the requisite mathematics and science skills including developing coping skills to manage the demands of living and learning at university. A follow-up of non continuing college of Science showed that some students left the University after successfully completing the two year programme. These students used their achievement in the programme to apply for admission into Faculties and courses at other tertiary institutions where they would not have qualified with their poor Matric marks.

The BSc 4 year degree programme students are identified from the start as a high risk group. Selection test are aimed at identifying potential from a group of students who according to their matric results would stand very low chance of graduating in the science faculty. No selection test is perfect and like other programmes, the extended programme students suffer dropouts and failures. However, by far the greatest
number of dropouts and failures in the programme occur in the first year. This is less the case in mainstream.

**Table 2: 1992 – 2005 BSc 4 year programme; Total Moved Faculty and Graduates**

<table>
<thead>
<tr>
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<tr>
<td>BSc 4-year degree programme</td>
<td>Total</td>
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<tr>
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<tr>
<td>Moved Faculty</td>
<td>178</td>
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<tr>
<td>Total Graduates</td>
<td>56</td>
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</tbody>
</table>

**Table 3: 1992 – 2005 BSc 3 year degree programme/ Mainstream Total Intake and Graduates**

<table>
<thead>
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<td>BSc 3 year degree programme/ mainstream</td>
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**Table 3** shows that only 1899 of the 4 512 BSc 3 year programme/mainstream students successfully completed the junior degree. This figure is less than 50% of the total intake of the period 1992-2005. The graduation figure for the BSc 4 year programme is 50% and when combined with graduate’s figures from other faculties, the extended curriculum students seem to have outperformed the mainstream students. The figures of mainstream students who moved faculty and graduated was not considered as students are regular and qualified to enter those faculties, unlike the extended curriculum students who had the flexibility to use the programme to develop their mathematics and science skills and stay in the science faculty or move to the course or faculty of their choice. Despite good Matric results, the science faculty seems to graduate fewer or more or less the same number of mainstream students as compared to those of the foundation course. The graduation rate of the previously socio-economically disadvantaged students is actually better in the BSc 4 year degree programme than in the mainstream. This is even more a cause for concern as (Mumba Rollnick and White 2002) noted that in addition to good matric results; almost all students from township schools in the mainstream have experienced some other type of bridging. Table 3 further suggest that mainstream students have a higher proportion of dropout rates and most of the students take more than three years to complete the degree. If science faculty is keen in increasing its throughput rates, the above explanation suggests that the BSc 4 year degree programme is a viable route for some of the mainstream students.
POSTGRADUATE QUALIFICATIONS

Table 4: BSc 4 Year degree Postgraduate Graduates degrees in Science

<table>
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<th>Year</th>
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<tr>
<td>Diploma</td>
<td>Honours</td>
</tr>
<tr>
<td>Science</td>
<td>Other</td>
</tr>
<tr>
<td>African 12</td>
<td>29</td>
</tr>
<tr>
<td>Coloured</td>
<td>5</td>
</tr>
<tr>
<td>Indian 1</td>
<td>12</td>
</tr>
<tr>
<td>Total 12</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>Diplomas 47</td>
</tr>
</tbody>
</table>

It can be seen from table 4 that some of the BSc 4 year degree programme students went on to further their studies. Since the first cohort completed the BSc 4 degree in 1994, from 1995 – 2008, the programme recorded a total of 254 postgraduate degrees. 207 of these postgraduate degrees are in sciences and 47 are in other Faculties. It is worth noting that of the 3 PhDs, two are in pure Mathematics and one in Chemistry. The programme has given the students the opportunity to become role players in many of the disciplines they graduated from and also to contribute to the human resource and economic needs of the country.

REFLECTIONS AND WAYS FORWARD

Institutional threats to the programme

There have been severe threats to the programme caused mainly by financial constraints at institutional level. In the past when the programme was called the College of Science there was a dedicated staff contingent whose primary responsibility was teaching in the programme. The arrangement allowed staff to teach the same group of foundation students for over two years. This further allowed staff the opportunity to gradually withdraw the extra support given to students in an attempt to address the gaps that might have arisen for whatever reason during their schooling. Currently, students stay for just over one year in the programme. During the second year they are placed in mainstream classes. Teaching staff are now school based and teach both foundation and mainstream students in large classes at the second year level of the programme. When the current attrition rate at the second level of the programme is compared to what it was before restructuring, it is clear that that the higher failure rate may be indicative of the fact that one year is too short to deal with the problems that these students bring with them.

It is clear that this type of teaching requires more resources than the usual big class lectures. It is essential that class sizes be kept small which requires an investment in human capital. Foundation programmes cannot flourish in environments characterized by “rationalization”, increased “throughput” and similar philosophies which are arguments for withholding resources.

Before the implementation of cost cutting measures the programme was able to graduate significant numbers at both undergraduate and postgraduate levels. Besides those that have graduated from this university there are others who went to other institutions, having used the programme as a stepping stone. They have graduated elsewhere though their success stories are unknown with few anecdotally known and researched cases Matlou (1999).
Way forward
It is clear that these programmes have been successful in times of dealing with educational disparity and with increasing the overall number of graduates. In spite of hopes to the contrary, it is clear that the education system at school level is inadequate. It is no longer only the formerly socio-economically disadvantaged students who are struggling to cope, but all students across the board. It is thus imperative that these types of programmes be deracialized and institutionalized so that all students with educational disadvantage benefit. In a nutshell, the universities need to spend more money, not less is support of programmes of this nature.

Acknowledgements: For input in terms of statistics and information. Statistics: Management Information Unit: Ms Harshila Dulabh, Ms Tracy Bluck and Mr Amer Nazir. Course related information: Academic staff teaching BSc 4 year programme course/students

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INTRODUCTION

The Centre for Science Access (CSA) of the University of KwaZulu-Natal (UKZN) is situated within the Faculty of Science and Agriculture, in the College of Science, Agriculture and Engineering. The CSA is a unit that arose from the 2004 merger of programmes previously located in the former Universities of Natal and Durban-Westville. Although the CSA is relatively new, its constituent programmes all have long histories of providing access to science-related degrees to students from disadvantaged educational backgrounds.

For UKZN, the CSA is a strategic mechanism for redressing inequities among students in the natural and applied sciences. At its formation in 2004, UKZN proclaimed its mission as being “A truly South African university that is academically excellent, innovative in research, critically engaged with society and demographically representative, redressing the disadvantages, inequities and imbalances of the past [authors’ emphasis]”. Within UKZN, Africans and students from disadvantaged schooling backgrounds have historically been more acutely under-represented in College of Science, Agriculture and Engineering than anywhere else in the institution. The CSA is therefore a critical component of the University’s agenda on access and equity, and was designed in line with the University’s senate-approved Access Policy and statutory framework.

At the inception of the CSA, the Faculty of Science and Agriculture had a total enrolment of about 4000 students, including about 1400 Black African students (about one third of the total) who had been admitted through the Access programmes. Significantly, all the students admitted via the Access programmes would NOT have met the entry requirements of the Faculty. If these (Access students) are not considered in the Faculty’s enrolment above, the Faculty’s proportion of Black African students would have dropped from about 50% to about 15% (in a province which is 85% Black African). This is illustrated in Table 1.

<table>
<thead>
<tr>
<th>Demographic group</th>
<th>No. of students</th>
<th>% of total enrolment</th>
<th>% of KZN Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black African</td>
<td>2,033</td>
<td>49.60%</td>
<td>85%</td>
</tr>
<tr>
<td>Black African students who entered through Access programmes</td>
<td>1,394</td>
<td>34%</td>
<td>n/a</td>
</tr>
<tr>
<td>Non-Access Black African students</td>
<td>639</td>
<td>15.60%</td>
<td>n/a</td>
</tr>
<tr>
<td>Coloured</td>
<td>50</td>
<td>0.10%</td>
<td>1.50%</td>
</tr>
<tr>
<td>Indian</td>
<td>1,475</td>
<td>36%</td>
<td>8.50%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>White</td>
<td>534</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,095</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
THE STRUCTURE OF SCIENCE ACCESS AT UKZN.

The CSA offers three streams of science access, as illustrated in Figure 1:

1. **BSc4 (Augmented) stream**

The BSc4 Augmented programme has been operating since 1991 (at the former University of Natal, Durban) as the Extended curriculum; and is now offered on the Westville and Pietermaritzburg campuses of UKZN. It is for students from disadvantaged schools, who wish to enroll for science degrees, but whose matric results are slightly below faculty entry requirements. The students must have a full matriculation exemption or a National Senior Certificate (NSC) that qualifies them for a Bachelors degree (NSC-Deg.). The students are admitted into the first year of BSc, but initially take fewer courses ‘augmented’ with tutorials and practicals. The students attend these fewer courses along with the ‘mainstream’ students, and then have ‘augmented’ tutorials and practicals that are formal, timetabled, and examined. The marks obtained for the ‘augmented’ continuous assessment count exactly as much as ‘mainstream’ continuous assessment, and the Augmented students sit the same final exam as mainstream students.
'Augmentation' is aimed at providing the students with skills, basic knowledge, and competencies required for success in the degree under 'mainstream' conditions. The students therefore also take two semesters of a Language course (Scientific Writing or Communication in Science) as a requirement for their degree; and attend compulsory, timetabled Life Skills workshops for one semester.

Because of the augmentation, the first year of the degree is spread over a maximum of two years during which students can also take some second year modules. Thereafter students carry the normal load for their degrees. Thus, students take four years to complete a three-year science degree, having progressed more slowly, but in our experience, are more assured of success.

The CSA admits about 180 BSc4-Augmented students every year, who form part of the Faculty's enrolment target.

2. BSc4 (Foundation)
The BSc4 Foundation programme is for students from disadvantaged schools who have a full matric exemption/NSC-Deg., but whose matric points or grades are not sufficient for the BSc4 Augmented option. This programme is a modification of the Science Foundation Programme (SFP), which has been in existence on the Pietermaritzburg campus since 1991 and on the Westville campus since 1999. Because of the low matric grades, admission into this stream is based on performance in Selection Tests (the tests have been designed and refined by the CSA over several years, and test the students' competence in various scientific and mathematical constructs which are deemed important for success in science-related degrees). Students who perform satisfactorily in the Selection tests are admitted into the BSc degree, and offered full year of Foundational courses that are aimed at improving their knowledge, practical and study skills in Mathematics, Physics, Chemistry and Biology. The Foundational courses may not necessarily contain first-year level content, but have the same cognitive demands as mainstream first year, and earn credits towards the degree registered for. The Foundation year is therefore the first year of a 4-year degree. During this Foundation year, students also take courses in Communication in Science and attend compulsory, timetabled Life Skills workshops for the full year. A pass of 50% in every module enables the students to proceed to their 2nd year (with mainstream Level 1 students). However, BSc4 Foundation students take a lighter mainstream academic load, owing to the credits already earned in the Foundation year, and their degree is structured such that they only need to take a full academic load in their final (4th) year of study.

The CSA admits about 240 BSc4-Foundation students every year, who form part of the Faculty's enrolment target.

3. The Science Foundation Programme
This programme is similar to the BSc4-Foundation stream, above, except that it is for students who do not have a full matric exemption or NSC-Deg. Those who are admitted into the SFP are provided with a full year of foundational modules, including Mathematics, Physics, Chemistry, Biology, Communication in Science and Life Skills. A pass of 50% in every module provides students with access to the first year of a science degree at UKZN. However, the courses done during the SFP year do not earn credits towards the degree.

The enrolment target for the SFP is capped at 10% (up to a maximum of 50) of the combined BSc4-Augmented and BSc4-Foundation enrolment. Although relatively small in number, the students admitted
into the SFP represent a group of students in the country who study at schools which are so under-
resourced that it is practically impossible to earn the exemption/ grades required for entry into University
studies.

**ENROLLMENT FIGURES**

Among them, the programmes of the CSA have, since their inception, enrolled over 5,000 students. In the
current year (2009), the Centre has a total enrolment of 453 students. Starting from very small numbers in
1991 (10 students in the Extended Curriculum programme at the former University of Natal, Durban [UND];
and 30 students in the SFP at the former University of Natal, Pietermaritzburg [UNP]), enrolment peaked in
2003 with almost 900 students (89 at UND, 235 at UNP and 572 in the SFP of the former University of
Durban-Westville). Following the merger, however, enrolment for the CSA was capped at 500, in line with
the Faculty’s enrolment plans.

Although enrolment has now stabilized at a generally constant level, when the progress of enrolled
students is tracked, it is evident that the number of graduating ex-CSA graduates closely follows the pattern
of enrolment numbers, with a lag of about 4 years (Fig 2)

![Graph showing enrolment and graduation numbers](image)

**GRADUATION AND THROUGHPUT RATES**

Since the merger of previous programmes to form the CSA in 2004, the CSA has twice commissioned the
University’s department of Quality Promotion and Assurance (QPA) to undertake independent studies (one
in 2004 and another in 2007) evaluating graduation and throughput rates of students admitted via the
access programmes. The data for the studies was obtained from the University’s Division of Management
Information (DMI), and therefore represented official University data.

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1 REPORT ON THE EXERCISE UNDERTAKEN TO ANALYSE STUDENT COHORT DATA ON THE SCIENCE FOUNDATION PROGRAMME
(PMB AND WESTVILLE) AND THE EXTENDED PROGRAMME - Report Compiled by Dr Florence Southway-Ajulu, Quality Promotion
&Assurance
July 2005

2 IMPACT OF CENTRE OF SCIENCE ACCESS PROGRAMMES ON GRADUATION RATES- Report Compiled by Dr Florence Southway-
Ajulu, Quality Promotion &Assurance, December 2007
Some notable aspects of the above studies include:

For the cohorts 1991-2000 (the 2004 QPA study):

- The Extended Curriculum had cohort graduation rates reached a high of about 60%, having been lowest for the first cohort (1991), and improving as the programme ‘settled down’. Taken altogether, 42% of students admitted during the years studied had graduated. Considering that some of the students from the latter cohorts studied had not yet graduated by the time of the study in 2004, the QPA estimated that the final graduation rate of these cohorts would be just above 60%. (Figure 3).

![Figure 3: Percentage of BSc4-Augmented students who had already graduated (BSc4) or were still in the University and had a chance to graduate (BSc4+) in the 2004 evaluation of Science Access programmes.](image)

- The SFP previously based at the Pietermaritzburg campus was analysed in two ways: either as a ‘selection year’, with the throughput of students being considered once the students had joined mainstream; and in terms of throughput based on original intake (including those excluded during the Foundation year). In the former case (once Foundation students had joined mainstream) the QPA found that the graduation rate for the cohorts studied was 62%, with cohort graduation rates as high as 85% (1994 cohort). Considering students who had not yet graduated by the time of the study, the final overall graduation rate of the post-Foundation cohorts studied was estimated to be in the region of 60% (Figure 4). If throughput rates are calculated to include students excluded during the Foundation year, the overall graduation rate of the cohorts studied was 45%, with rates as high as 60% achieved by the 1994 and 1995 cohorts.
For the Foundation programme based at the former University of Durban-Westville, only two cohorts were analysed in 2004 (the inaugural 1999 cohort and the 2000 one), and the overall graduation rate was 22% based on those who proceeded to mainstream from the Foundation year, and 18% based on original enrolment. If those students (from the 1999 and 2000 cohorts) who had not yet graduated by the time of the study were taken into account (and assumed they would graduate), the graduation rate would be about 54%.

For cohorts which had no more students in the system (i.e. all potential graduates had graduated), the QPA study found that there was “very little difference in graduation rates between the mainstream and the access programmes”.

Studies on the time taken by students to graduate were considered more fully in the 2007 QPA study (below).

For the cohorts 1996-2002 (the 2007 QPA study):

- Between 1996 and 2002, the access programmes had admitted a total of 2,330 students (259 in the extended curriculum and 2,071 in the Science Foundation programmes). Of those admitted through the extended programme, 63% had either graduated or were on course for graduation (with actual graduation rates varying by annual cohort from 51% to 64%), while about 50% of students admitted via the Science Foundation Programmes had either graduated or were on course to graduating. Evidently, the graduation rate of students admitted via the extended programmes had stayed unchanged from the earlier cohorts studied, but that of Science Foundation students had dropped – and it is significant that this had been accompanied by steep increases in enrolment in the Science Foundation programmes (see Figure 2).

- The above graduation figures should be viewed against a graduation rate of about 65% for mainstream students at the University of KwaZulu-Natal over the same period.
• It is also significant that a comparable nationwide study has shown that, on average, less than 50% of students who register at South Africa’s contact-teaching universities complete their degrees or diplomas.\(^3\)

• Regarding throughput, the 2007 QPA study compared the throughput rates of access students to those of mainstream students from similar socio-economic backgrounds. This would probably provide a better indication of the role played by access programmes than would a comparison between access programmes and students from ‘top’ schools (who are not likely to have had would not have had the challenges faced by access students). The study showed that, although access students would NOT have been admitted to the University as they had not met the entry requirements, the percentage of these students who finished their degrees in minimum time or in minimum time “plus one” was similar to that of direct-entry students from similar socio-economic backgrounds (Table 2).

<table>
<thead>
<tr>
<th>Year of graduation</th>
<th>Time to graduate</th>
<th>(African) Access</th>
<th>African mainstream</th>
<th>Non-African mainstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Min</td>
<td>40.7</td>
<td>34.1</td>
<td>52.7</td>
</tr>
<tr>
<td></td>
<td>min+1</td>
<td>30.5</td>
<td>37.5</td>
<td>35.4</td>
</tr>
<tr>
<td></td>
<td>min+2</td>
<td>23.7</td>
<td>12.5</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>&gt;min+2</td>
<td>5.1</td>
<td>15.9</td>
<td>6.1</td>
</tr>
<tr>
<td>2005</td>
<td>Min</td>
<td>34.8</td>
<td>28.8</td>
<td>46.3</td>
</tr>
<tr>
<td></td>
<td>min+1</td>
<td>46.1</td>
<td>45.6</td>
<td>37.6</td>
</tr>
<tr>
<td></td>
<td>min+2</td>
<td>11.2</td>
<td>15.2</td>
<td>11.9</td>
</tr>
<tr>
<td></td>
<td>&gt;min+2</td>
<td>7.9</td>
<td>10.4</td>
<td>4.2</td>
</tr>
<tr>
<td>2006</td>
<td>min</td>
<td>28.6</td>
<td>32.0</td>
<td>42.6</td>
</tr>
<tr>
<td></td>
<td>min+1</td>
<td>40.7</td>
<td>37.3</td>
<td>39.3</td>
</tr>
<tr>
<td></td>
<td>min+2</td>
<td>19.8</td>
<td>22.0</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>&gt;min+2</td>
<td>10.9</td>
<td>8.7</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Table 2: An analysis of graduating cohorts in 2004-2006 with respect to throughput, demographic group, and mode of entry into the University. This was for the Faculty of Science and Agriculture. (min, minimum time for degree; min+1, minimum time for degree plus 1 year, etc). Source: QPA, UKZN, 2007.

• With regard to individual modules within the Faculty of Science and Agriculture, the 2008 study found that there were no modules in which Science Access students did worse than mainstream students, and that module performance fluctuated from year to year, for both mainstream and Access students. During the first year, students in the BSc4 (Augmented) programme sit the same exams as directly entry students, and performance of the two groups of students has not been noticeably different (e.g. Table 3).

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Table 3. The performance of BSc4 (Augmented) students ('Augm.') and direct-entry students ('mainstream') at the end of the 2nd semester 2007 at the Pietermaritzburg campus. The students sat identical exams.

<table>
<thead>
<tr>
<th></th>
<th>Maths 1</th>
<th>Chemistry 1</th>
<th>Physics 1</th>
<th>Biology 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Augm.</td>
<td>Main-stream</td>
<td>Augm.</td>
<td>Main-stream</td>
</tr>
<tr>
<td>Average mark (%)</td>
<td>63.7</td>
<td>58.7</td>
<td>56</td>
<td>51</td>
</tr>
<tr>
<td>% Passed</td>
<td>91</td>
<td>73</td>
<td>72</td>
<td>53</td>
</tr>
</tbody>
</table>

- Although the Centre for Science Access is based in the Faculty of Science and Agriculture, many Science Access students change Faculties in the course of their studies (as do other University students). Thus, any graduating cohort has Science Access students attaining a constellation of qualifications, as indicated in the qualifications breakdown of Science Access cohorts between 1996-2004 (up to the 2007 graduation), illustrated in Table 4.

<table>
<thead>
<tr>
<th>Degree/Qualification</th>
<th>Total ex-science Access graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc or Other First Degree in Science</td>
<td>648</td>
</tr>
<tr>
<td>Medicine</td>
<td>92</td>
</tr>
<tr>
<td>Engineering</td>
<td>82</td>
</tr>
<tr>
<td>Health Sciences (e.g. pharmacy, physiotherapy, optometry, etc)</td>
<td>58</td>
</tr>
<tr>
<td>Non-Science First Degree (e.g. B.Comm, LLB, B.Ed, etc)</td>
<td>272</td>
</tr>
<tr>
<td><strong>Total: Bachelors Degrees</strong></td>
<td><strong>1,152</strong></td>
</tr>
</tbody>
</table>

Table 4: The faculties in which the 1996-2004 cohorts of Science Access students attained degrees (up to the 2008 graduation ceremonies). *Source: Division of Management Information, UKZN*

- The 2007 study found that the throughput rates of students admitted into the science access programmes who then moved to the Faculties of Engineering and Medicine was not significantly different from that of Black students admitted directly into Engineering and Medicine (even though the latter would have had high-end matric grades, while the Access students would not have met the entry requirements for a Science-based degree).

- The 2007 QPA study also probed the quality of degrees (as measured by the average score in final-year modules) obtained by students admitted via access programmes, relative to that of direct-entry students. It found that, over the 2004-2006 graduating cohorts, the percentage of Access students averaging at least 60% in their final year modules (and therefore qualifying for Honours studies at the University) was not significantly different from that of direct-entry Black students (the percentages were 30% and 33%, respectively). However, this was lower than the percentage of other direct-entry demographic groups, and this trend was observed for the Faculties of Science and Agriculture, Medicine, and Engineering.
Since their inception in 1991, the science access programmes at UKZN have produced about 1,500 undergraduates and nearly 200 postgraduates (including PhD); and, with about 1,000 science access students still in the University in 2009 (see Fig 1), the Centre is making a significant contribution to the number of UKZN graduates who come from educationally disadvantaged backgrounds. It is noteworthy that all those graduates would not have been admitted to study science-related degrees at the University were it not for the Centre.

THE BASES FOR SUCCESS

The success of the science access programmes offered by the CSA can be attributed to a variety of factors, including:

- **Support from the Faculty and Executive.** The Centre, as constituted after the formation of UKZN, has had strong and reliable support from the Faculty and University Executive.
  - At University Executive level, the University appointed an Executive Director (Access), to coordinate, lead and champion matters of Access (in the widest sense - including retention, monitoring and throughput of all students at the University) at the highest level. This Executive post was subsequently replaced by a Deputy Vice Chancellor (Teaching and Learning), under whose ambit matters of Access fall. The University also has a clear policy framework on Access, and has a senate-approved Access Policy. It is instructive that the main thrust of the Centre for Science Access, redress, is part of the University’s transformation agenda – as advocated for in the University’s mission statement.
  - At Faculty level the Centre is given the status of a School, and the Head of the Centre has the same status as other Heads of Schools in the Faculty (e.g. being a member of the same Faculty Committees as other Heads, and having the same platform on Faculty governance as other Heads). The Head of CSA also, by virtue of the office, is a Faculty representative on Senate. Furthermore, in all Faculty Board meetings, there is a standing agenda item in Science Access (significantly, this is under the heading ‘Educational Development’). Thus, the Centre has every possible platform for advocacy – from Faculty level to the highest academic structure of the University. Crucially, the Centre has been fortunate to have a succession of Faculty Deans who have been extremely supportive of Science Access. Without the support afforded by the Deans, it is questionable whether any of the other ‘structural’ support would materialize or be as effective.

- **Staff.** The Centre has a highly committed staff, which has been largely unchanged for many years (many staff members have been teaching in the Centre for over 10 years) and this has allowed the entrenchment and growth of experience and good practice. Also, many staff members are on the permanent staff establishment and this has created a strong sense of stability and enabled strategic and long-term planning. It is also significant that all academic staff are based in their ‘discipline’ Schools, and are often involved in ‘mainstream’ teaching and leading academic development activities in those schools. Because of placement in Schools, staff have dual reporting lines (to the Heads of their discipline Schools and to the Head of Science Access), except Language staff (who are based wholly in the Centre).

- **Curriculum and academic discourse.** The educational philosophy at the Centre for Science Access can be represented in the framework below (Figure 5).
The curriculum itself is heavily informed by constructivist thinking, and the classes have a limited size (maximum 40), with high staff:student ratios (as high as 1:13 during practical classes). Notably, the language courses, rather than focus on the surface features of English language, use the texts of appropriate scientific genres to teach literacy; and also make use of the students’ own social language capital, and therefore lean towards ‘South African’ English (sometimes referred to as Black South African English). The language courses are also designed to address Academic Literacy in the broadest sense, including the ‘induction’ of students into the scientific writing community of practice. Thus, they are designed around the ‘process’ of reading, writing and other scientific communication; and are assessed continuously rather than with a final, closed-book examination. It is noteworthy, the teaching of language has not been static, but has evolved as informed by research published by some of the Centre’s language staff⁴.

- **Quality Assurance.** All the modules are regularly evaluated by both the ‘mainstream’ disciplines and external experts. The curricula of the Access modules are developed in consultation with mainstream and this has led to cases of cross-pollination of good practice between Access and mainstream curricula. It is also significant that there are regular (monthly) meetings of Access staff.

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(academic and counseling staff together) to facilitate ‘horizontal’ integration of the curricula, at-risk monitoring, and all-round development of the students.

As mentioned above, the Centre has commissioned two independent evaluations between 2004 and 2007, and this is planned to be a regular evaluation. It is significant that these evaluations have been done with close association and cooperation with the Faculty, and the results are tabled before the Faculty Quality Committee and Faculty Board.

CHALLENGES

Some of the ongoing challenges for the CSA relate to selection issues, such as how to more effectively predict which students will succeed in the University, particularly because we select students based on their potential (they all do not meet the entry requirements into the Faculty); as well as how to continuously improve teaching and learning practices in the access programmes.

Another challenge relates to funding for the operational costs (including staffing, a sizeable proportion of whom are still on contract), and funding for students. The latter is significant because there are many talented students who are unable to take up the opportunity afforded them by the Centre because they do not have the funds for tuition fees, accommodation, etc. Even when they can afford to get into the University, there is evidence that financial constraints are a major reason for student withdrawal/ exclusion from Universities in this country\(^5\). Although UKZN invests heavily in the Centre, additional support from external donors and investors has always been sought.

Despite the challenges, the CSA provides opportunities for generations of South Africans whose education might have ended at secondary school level, and it also contributes towards addressing key national needs in the applied and natural sciences. In our experience, the success of this initiative can be summarized by the figure below.

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University of the Western Cape EMS Foundation programme: Analysing its Success.

R.G. Arendse, UWC

INTRODUCTION
This paper focuses on analysing the performance of students enrolled for the four-year degree programme in the Faculty of Economic and Management Sciences at the University of the Western Cape. In so doing, there is a description of what modules the degree includes as well as what structures are implemented to support the programme. Thus far, the programme has shown some success as a percentage of the first intake of students in 2005 completed their degrees in 2008 (within the required four-year period). Over these years there have been developments to enhance the platform for teaching and learning within the programme. These continuous modifications to the programme bring about new ideas to chance the success of the four-year degree.

Access to universities as been at the forefront of discussion for the South African education system (Nation Academic Plan in South Africa 2001), and great strides have been made. The introduction of a Foundation Programme is one accommodation provided by the Department of Academic Development in the Faculty of Economic and Management Sciences at UWC. It was established in 2005 and aims to provide disadvantaged students with the opportunity to complete a Bachelor's degree in Commerce. The Foundation Programme is now formally included in the Baccalaureus Commercii (B Com) four-year degree and is spread across the first two years of the degree.

Foundation programmes, according to Warren (1998:80), have different meanings: on the one hand “It may be understood as “bridging” ... On the other hand, the term could also mean laying foundations for further study, such as “forward looking” entry- level courses to introduce students to key academic concepts and ways of knowing”.

Although some believe it is not worthwhile to invest money and effort into bridging programmes, those of us who understand the need and value thereof should engage in research to prove the success of these programmes (Hay and Marais, 2004). The faculty of Economic and Management Sciences is using a strategy of combining credit-bearing foundation modules with the regular mainstream modules to give students a fully accredited degree. This means that a student entering the four-year degree programme will complete their first academic year over a period of two years and then completing the degree with mainstream modules. This means that the foundation modules run concurrently with mainstream modules being completed by three-year degree students.

The main focus of the extended programme is to improve numerical and linguistic abilities for specific use in the commercial field since students who are admitted to the four-year degree programme are generally those with lower English and Mathematics results than those achieved by the mainstream students.
COURSE STRUCTURE
The following foundation modules comprise various introductory and support modules:

First Year
- Quantitative Skills for Foundation
- Academic Literacy for Business
- Introduction to the Business
- Economic Literacy
- Introduction to Accounting

Second Year
- Analytical and Critical Thinking I
- Quantitative Analysis for Commerce
- Analytical and Critical Thinking II
- Intensive Reading
- Intensive Writing

These modules, as previously stated, are combined with mainstream modules in both the first and the second year. The reason for this is to help students adjust to the workload expected of full time university students. All modules in the first year entail a combination of lectures as well as tutorials, although each foundation programme module has an extra tutorial in the first year so as to deal with weekly problems which students may encounter.

There are a number of reading and writing modules designed not only to build the students’ literacy skills but also to assist them to successfully complete second and third year modules.

Students in the first year attend an extra tutorial per foundation module, which serves as an attempt to counter the problems which students may have on a weekly basis. Foundation lecturers are generally appointed for their flexibility and eagerness to employ new teaching and learning methodologies; for example, e-learning, e-teaching, power point and video presentations in lectures.

The lecturers also have an ‘open-door’ policy with regards to consultation and professional post - graduate tutors are employed who are dedicated to providing a good academic foundation to their students.

The four-year degree programme has grown since its initiation in 2005, and now employs a full time a staff of seven lecturers dedicated to the programme. The modules within the programme are reviewed and improved on a continuous basis, which has brought about the introduction of new modules and development of existing modules.

The Foundation Programme works in conjunction with the Economic and Management Sciences Student Support and Research Unit (ESSRU) which tracks students’ performances and provides various interventions. ESSRU provides the following services:

a.) Tracking students’ progress in the modules
b.) Providing life skills and learning skills to students
c.) Organising a peer-tutoring programme

Walberg (2003, 3) states that a students academic performance can improve if given the necessary life skills support. This suggests that a “motivated” learner will have a more positive approach to the learning environment and hence lead to a greater likelihood of success.

The Foundation Programme and ESSRU are in constant communication to ensure the effectiveness and success of the support structures. The various lecturers from the foundation programme forward the names of students who are experiencing difficulties within a specific module, based on either academic results or consultations. ESSRU then consults and tracks these students, providing appropriate support to enable them to achieve stable academic performance and empowering them to manage their difficulties.

SUCCESES OF THE PROGRAMME

ACM 112 is a compulsory course for both B. Com three-year (mainstream) and B. Com four-year (foundation) students. The three-year students were the 2008 intake, the four-year students the 2007 intake. The four-year students would register for ACM 112 in their second year after successful completion of a support course, Introduction to Accounting (ACC 121), a basic bookkeeping course, in their first year.

A total of 269 students registered for ACM 112 in 2008: 176 students from the three-year programme and 93 students from the four-year programme. The pass rates for the module are shown below.

There were 176 B. Com Three (3) year students who registered for ACM 112 in 2008. The final result shows that 107 students passed the module, 57 students failed and 12 students did not qualify to write the final examination. The final marks show the average mark as 52%. Tables 4 and 5 below represent these results.

<table>
<thead>
<tr>
<th>ACM 112 (3 year degree)</th>
<th>Number of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pass</td>
<td>107</td>
<td>61%</td>
</tr>
<tr>
<td>Fail</td>
<td>57</td>
<td>32%</td>
</tr>
<tr>
<td>Did not qualify</td>
<td>12</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 1 ACM 112 Pass Rate (3 year degree Students)

<table>
<thead>
<tr>
<th>Descriptive statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>52%</td>
</tr>
<tr>
<td>Median</td>
<td>53%</td>
</tr>
</tbody>
</table>

Table 2 ACM 112 Class Average and Median for B.com Three (3) year students

There were 93 B.Com four year students studying the same course in 2008. As already pointed out these students had previously passed an intensive, foundation accounting course. The final results show that there was only one failure while 92 students passed the module. The final marks show that the average mark is 66% and the median is therefore 66% for the Foundation students.
The findings show that the B.com Four year intervention module ACC 121 has helped to equip students with their accounting literacy. The B.com Four (4) year students of 2007 who passed the ACC 121 were clearly outperforming the B.com Three (3) year students of 2008.

The 99% pass rate in ACM 112 for the B.com Four year students compares favourably with the B.com Three year students who only achieved an average mark of about 61%. In terms of the average marks, the B.com Four year students outperformed the B.com Three year student by 14% and the foundation group also outperformed the class average by 9%.

**Success of students in later years**

Students who complete the two-year foundation support programme and enter their regular studies have a reasonable to high pass rate within the given time. The foundation students from the 2005 cohort who successfully made it onto the regular programme in 2007 had a pass rate of 45% in 2009. This is substantially better than the national university average pass rate within the given time of about 30%.

Eleven of those who graduated in 2008 have pursued post-graduate studies at the university, five of whom also received bursaries from Sanlam to complete their B. Com Honours Degrees in Finance.

There is however a further problem. Despite the high success rate of students who pass foundation too many students drop-out during this time. A study done by The Human Sciences Research Council’s Student Pathways, found that 60% of students, mostly from very poor homes, dropped out of university before completing their studies. The main reason was a lack of finance but other reasons included social and academic issues.

**CONCLUSION**

It is evident from the above information that the foundation programme is successful, and allows students to not only further their education but also pursue postgraduate studies. One might argue that the focus should be on the schooling system rather than foundation programmes. While this may be true, we should not be restricted by the current education system but try to assist students to meet the requirements at the higher education level.

In the view of these positive results, the programme continues to grow within the Faculty of Economic and Management Sciences. We now have to shift our view from “access” to “success”, creating solid foundation
programmes within the university or providing the necessary support to existing programmes. The only way the programmes’ success can be maintained is through regular reflection, careful tracking of students progress, continuous curriculum development, staff development and student support.

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Promoting Access and Success at Stellenbosch University’s Faculty of Health Sciences

Gert Young, SU

INTRODUCTION
Stellenbosch University’s Health Sciences faculty has been offering Extended Degree Programmes (EDPs) since 1995. The programmes have always endeavored to offer access to students from disadvantaged backgrounds who exhibited the potential to succeed both academically as well as professionally. Competition for entry in the MBChB programme is fierce (because of limited availability) and generally speaking only students who score well above the minimum entry requirements are accepted. The extended programme has made it possible for students who, although they meet the minimum requirements, would not get access because of the competition for limited available placement, to pursue their goals and realize their potential.

The programme discussed here is the faculty’s MBChB programme (7 year). Currently the mainstream MBChB programme consists of 6 years of academic and professional training while the extended programme offers the same focus on academic and professional training, but over a period of 7 years. It is also worth noting that the faculty starting implementation of a new curriculum in 2007 that is intended to streamline learning and promote academic and professional development. Both the mainstream and EDP students are beneficiaries of this new curriculum.

The mainstream programme
The initial years of the mainstream programme focus on academic training that prepares students for the introduction of clinical training from the third year. Hereafter the academic training continues but the clinical training steadily increases. The fifth year of study dedicates more than half the credits for the year to clinical training while the final year is reserved for the continuation of the student’s clinical preparation. The Faculty has formulated a vision of the ideal health care professional and has reflected the vision in the content and structure of the MBChB programme. This vision expresses the requirements of such an ideal health care professional in terms of the individual’s knowledge, skills and attitudes. These must allow the professional to function autonomously in the primary health care sector and facilitate ongoing personal and professional development, all for the sake of the betterment of the communities in which the professionals function. The focus of the curriculum is thus on intellectual pursuits of high academic standard as well as personal development.

Challenges for inadequately prepared students
It should be noted that all MBChB students (mainstream and EDP) face a challenging transition from school to university. The volume of work, as well the complexity increases dramatically and students are required to adopt new ways of learning. In the case of EDP students these challenges are often exacerbated as

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6 ‘Disadvantaged’ here refers to inadequate school preparation and is not necessarily a reference to race or class, although in the South African context these often correlate with inadequate schooling.

7 The faculty requires, as a minimum, 70% average in Grade 12. Over the last 10 years, however, the Grade 12 average of those students accepted to the mainstream was above 85%.
inadequate schooling did not prepare them with the necessary abilities to make these changes. They often require more overt support in assimilating the academic practices of the discipline.

To make this transition students require support both in terms of acquiring generic personal and professional skills as well as mastering discipline specific content. As pointed out, the MBChB programme requires that large volumes of work be done in relatively short periods of time. Students from a disadvantaged school background often don’t have the required study and time management skills to deal with the volume (admittedly this is not a challenge limited to students from a disadvantaged school background). The faculty’s experience has also been that EDP students often adopt a surface type approach to learning as for many this was the approach that was rewarded in their schooling. Disadvantaged students generally also need support in mastering more specific skills and practices associated with success in the mainstream MBChB programme. The mainstream module Health in Context 111, for example, has as an integral part the analyses of statistics using Excel. Disadvantaged students who have had insufficient training in the use of this software struggle with learning in this module. Some specific disciplinary areas that have been identified as problematic for students who had inadequate schooling are Biology and Chemistry. These are of great importance as a significant amount the initial prescribed academic work in the MBChB programme relies on the foundation provided by these two subjects.

Teaching in the mainstream is, especially in the initial years, conducted in larger groups (about 200-360 students per lecture, depending on the module). This is not always conducive to facilitating learning for inadequately prepared students, especially those without the requisite skills to interpret the events of the lecture in a meaningful way.

THE INTERVENTION

Apart from extending the programme by one year to facilitate a smoother transition through spreading the workload, the extended MBChB programme offers support in terms of generic and specific skills as well as disciplinary support.

The extended programme focuses on holistic support for students in terms of their personal, academic and professional development. Academic support comes in the form of both foundational and augmented modules. The foundational modules are:

- Strategic Communication 199
- Intermediate Metabolism 198
- Practical Clinical Exposure 198

The augmented modules are:

- Introduction to the Health Sciences 197 (augments Personal and Professional Development 111)
- Statistical Concepts and Computer Skills 197 (augments Health in Context 111)
- Biology 197 (augments Life Forms and Functions of Clinical Importance 111)
- Essentials of Disease Processes 198 (augments Essentials of Disease Processes 141)
- Chemistry 197 (augments Chemistry for Health Sciences 111)

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8 This is not to deny that students in the mainstream sometimes also adopt such an approach. However, the experience of the faculty has been that the EDP students require very specific support to adopt other approaches while, generally speaking, mainstream students have the ability to switch between their approaches to learning.
Basic Therapeutic Principles 198 (augments Principles of Therapy 141)

To assist with the transition and to promote student wellbeing and academic success the module Introduction to Health Sciences 197 was introduced in the extended programme. This module covers subjects like study skills, time management and stress management and prepares students for the mainstream module Personal and Professional Development 111. In conjunction with Strategic Communication 199 it offers a broad and solid base of generic skills and literacies that are required for success. To address the need for specific skills the module Statistical Concepts and Computer Skills 197 was introduced in the extended programme. This module prepares students for the statistical challenges that await them in Health in Context 111 by acquainting them with Excel and improving their general computer skills. As Biology (Physiology, Anatomy and Histology) and Chemistry form the basis much of the academic work in the MBChB programme, the extended programme incorporated Biology 197 and Chemistry 197 to prepare students for discipline specific success.

Apart from this dedication to personal, professional and academic development, the students enrolled for the extended MBChB programme also have the opportunity to be exposed to clinical work in their first-year, albeit as observers. The module Practical Clinical Exposure 198 is for the exclusive benefit of students in the extended programme and contributes greatly to the development of their professional identity at a very early stage. This gives the EDP students a distinct advantage over their mainstream peers who are only exposed to clinical experience from their third year.

A fundamental principle underlying the entire extended programme is the integration of all the different components. The foundational modules are all designed to articulate with specific mainstream modules or the programme in its entirety. The extended programme is run as part of the faculty’s formal offering and is coordinated by a dedicated programme committee. A senior lecturer has been appointed to coordinate the programme.

HAS THE PROGRAMME BEEN SUCCESSFUL?

In order to answer this question, some indicators of ‘success’ have to established. While not discounting qualitative measures, this chapter highlights quantitative indicators. From an institutional perspective retention and throughput rates are obviously important. Given the faculty’s vision of the ideal health care professional, other quantitative indicators have to be included as well. In order to deliver competent professionals the faculty strives for excellence in academic results (in other words more than just the minimum required to pass). To indicate excellence we have compared performance by EDP students to that of mainstream students in a selection of mainstream modules over the last three years. The mainstream modules included in this sample are Life Forms and Functions of Clinical Importance 111, Personal and Professional Development 111, Health in Context 111 and Chemistry 111.

Since its inception in 1995 the MBChB extended programme has enrolled 255 students. On average that is 18 students per year. Of the total, potentially 118 have been in the programme for the minimum amount of time required to obtain the degree. In other words 118 could possibly have graduated by the end of 2008. In total 62 of the 118 have graduated, resulting in a graduation rate of 52.5%. Of these just over a quarter succeeded in completing the programme in the minimum required time. Of the potential 118 a further 7 graduated in programmes other than the MBChB for which they initially enrolled (bringing the graduation rate to 58.4%). The remainder has either left the university or, in a few cases are still in the system. The graduation rate is lower than the rate for graduation from the mainstream MBChB (84.5%) but if it is taken

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9 This includes Biology 111 which was presented for the last time in 2007 before being replaced by Life Forms and Functions of Clinical Importance 111.
into account that the students in the extended programme would not otherwise have gained access to the MBChB programme, the conclusion is that the programme has produced 62 health care professionals that would otherwise never have had the opportunity to train as health care professionals. In addition, a high number of these graduates come from the designated groups as the figure below shows\textsuperscript{10}.

![% graduates per race group]

Another measure indicating performance in the programme is retention. As indicated by the figure below the highest attrition happens in the second year. This is possibly because of the challenges associated with transition from the support phase of the programme to the remainder of the mainstream. Retention in the MBChB extended programme has on average been 5%-7% higher than the average for the whole university since 1995. While this is slightly lower than the retention for the mainstream MBChB, the attrition is still relatively low.

\textsuperscript{10} These figures reflect the demographic composition of the potential 118 that have been in the programme for the minimum required residential time. It is important to note that traditionally Stellenbosch University has attracted higher numbers of colored students than black students, mostly for geographical reasons. The composition of the student body in the EDP should be viewed in this light. It is also worth noting that since 2002 the number of black students in the programme has increased steadily to about 20% of the entire EDP cohort.
The variation in retention in the years 1997-2001 is difficult to explain. The drop in retention in 1999 and 2000 coincides with a (albeit small) drop in retention in the MBChB mainstream.

The sharp increase in attrition at the end of the second year is shown below. While 7% of students are lost in the first-year another 14% leave the programme at the end of the second year. After this, attrition stabilizes at between 4%-6% per year.

In the four selected modules (Life Forms and Functions of Clinical Importance, Personal and Professional Development, Health in Context and Chemistry) the performance of EDP students has, over the last 2/3 years been close to that of mainstream students. This, given the fact that the extended degree programme students enrolled with Grade 12 aggregates of almost 15% lower than that of the mainstream students is a noteworthy achievement and can, one must assume, at least in part be attributed to structure and support content of the extended programme.
Success in the MBChB extended programme is often discounted with the argument that the students that enroll for the extended programme are still above average and that they would generally succeed regardless of the academic challenges that confront them. However, it is important to note that since 1995 the average Grade 12 mark for students in the extended MBCHB programme has been 71.2% while the average for the mainstream is 85.1%. Given this differential it is laudable that extended degree programme students perform satisfactorily compared to their mainstream peers.

Given the limited empirical indications above, can the programme be considered a success? It is the belief of both Stellenbosch University and the Health Sciences faculty that in the context of the dire need for skilled medical workers in the South African health sector, the programme contributes to the needs of the country. Compared to the enormous need the numbers may appear small but the programme is run on the conviction that large, seemingly insurmountable obstacles can be overcome by the continued and focused contributions of all the role players. The proverb about eating an elephant one bite at a time holds true in this case.

**WHY IS THE MBChB EXTENDED PROGRAMME SUCCESSFUL?**

There are numerous reasons for the success of the MBChB extended degree programme, not least of which is the faculty of Health Sciences’ dedication to teaching and learning practices and research as is evidenced by the creation of the Centre for Health Sciences Education and the high volume of participants in development workshops and teaching and learning research outputs. Furthermore the faculty has a clear understanding of the goals of the programme and has been able to include the programme in their strategic planning. In terms of the structure on content of the programme success stems from the fact that the programme is designed to focus not only on academic development but also on the development of professional identity. This allows students to maintain clear professional goals. Finally, a comprehensive selection process conducted by experienced staff members of the faculty also contributes to the success of the programme. In selecting students for the extended MBChB programme the faculty ensures that only students with the required academic and professional potential gain access.
A Pharmacy Foundation Programme Success Story at UPE/NMMU

Maritz Snyders, UPE/NMMU

INTRODUCTION

Pharmacy has been identified as a field of study where there is a big need for growth. South Africa as a whole, and the rural areas of the Eastern Cape in particular, experiences a shortage of qualified Pharmacists. The Department of Health in the province finds it difficult to attract Pharmacists from other parts of the country to the rural Eastern Cape. The province is mainly dependent on students being placed in these areas for their compulsory year of service after completion of their studies. However, this is clearly not a long term solution as most of these students leave the area on completion of their compulsory service. This leads to discontinuities in the Pharmacy services as well as having very few experienced Pharmacists. Hence, the ideal would be to train local students who come from the area and who would love to go back to the communities of origin to provide a service in this field.

The dilemma with this proposed solution is however the high academic demands in Mathematics, Biology and Science for success in the BPharm degree, linked to the low success rates in these subjects in secondary schools in the Eastern Cape. This implies that very few students from the rural areas of the Eastern Cape meet the requirements for admission to the BPharm degree.

The University of Port Elizabeth (UPE) identified Pharmacy, along with Science and Business, as an important field of study where a growth in the number of students from the previously disadvantaged communities is needed. In 1999 UPE introduced one-year foundation programmes leading to degree studies in these areas, called the University of Port Elizabeth Advancement Programme (UPEAP). Provision was originally made for prospective Pharmacy students in the UPEAP Science programme, but in 2002 a dedicated UPEAP Pharmacy programme was introduced. The introduction of the programme is described in detail in Snyders (1999). After the merger of UPE with the Port Elizabeth campus of the Vista University (UV) and the Port Elizabeth Technikon (PET) to form the Nelson Mandela Metropolitan University (NMMU), the programme was renamed the University Foundation Programme in Pharmacy, UFP (Pharmacy), in 2005.

UPEAP was originally funded by UPE from its own funds, but since 2004 it has been partially funded from the earmarked foundation programme funding received from the DoE. All the UFP programmes at NMMU were discontinued at the end of 2006 when the DoE stopped funding one-year foundation programmes (DOE, 2006). The decision to terminate UFP (Pharmacy) was a financial decision, and not based on the academic merits of the programme. In 2007 UFP (Pharmacy) was replaced by an extended 5-year BPharm degree at NMMU.

The purpose of this paper is to describe the UPEAP/UFP Pharmacy programme. The principles on which the programme is based will be given, followed by a description of the structure of the programme and some indications of the success of the programme.
PRINCIPLES BEHIND UPEAP/UFP PHARMACY

The steps that were followed to design the different UPEAP programmes are described in detail in Snyders (2001), and will not be discussed in detail here. The crucial point is however that, to be successful, such a design could not start by looking at an academic structure for the content students need to know. Before this could be done principles on which the design will be based had to be determined (Grayson, 1996). The team developing the UPEAP programmes agreed on the following set of 13 principles:

Looking forward ……not backwards: The focus is to be on what is needed for success at 1st year degree level and not on “gaps” in school work.
Access for Success: Careful selection of students is needed to ensure that only students with a reasonable change of success are admitted. The process followed by UPE to ensure this is described in Koch, Foxcroft & Watson (2001).
Holistic Approach: All factors having a possible influence on the student’s studies should be addressed and not only academic knowledge.
Skills in context: To achieve success at tertiary study a student needs a variety of skills in addition to content knowledge such as academic, study, life and social skills. The required skills can, however not be taught in isolation as this leads to transfer problems.
Integrated approach: Integration between different aspects of a foundation programme is essential.
Small group teaching: The value of interactive small group teaching in addressing the special needs of students has been documented and proved in many sources, e.g. Pratt (1994).
Resemble future programme: Preparation of a student for degree studies should hence include exposure to the same teaching model being used in degree programmes. Peer support: Students can learn a lot from peers that went through the same process. University Students on the same site of delivery as the future degree programme: Students in a foundation programme must feel part of the general university life.
Dedicated staff – not an add-on job: People with a special attitude towards and feeling for foundation level students should be involved in the programme.
Quality control: Quality control should take place on 3 levels: Internal quality control by the relevant academic departments, Statutory quality control through registration with the relevant Quality Authority, eg SAQA and peer evaluation between different institutions and programmes.
Continuous assessment: This will enable regular monitoring of the student’s progress. It will also force students to work constantly throughout the year. The final examination in the all courses in UPEAP/UFP contributed a maximum of 40% of final mark for any course.
Integrated assessment: This can be achieved through integrated projects involving skills and knowledge from different subject fields, as well as by integrating content and skills required for one module in evaluation of a different module.

These principles and the way which it was implemented in the design of the UPEAP programmes are discussed in detail in Snyders (2001).

STRUCTURE OF UPEAP/UFP (PHARMACY)

Admission:
For admission to UPEAP/UFP (Pharmacy) a prospective student had to be in possession of a Senior Certificate or equivalent qualification, with passes in English, Science and Mathematics at a minimum level of an E on Standard Grade. Students also had to perform satisfactory in the UPE/NMMU Placement Assessment Battery.
For admission to studies in the BPharm degree after completion of UPEAP/UFP, students had to obtain a minimum of 60% in every course in UPEAP/UFP (Pharmacy) or UPEAP/UFP (Science).

**Courses:**
The curriculum of the programme consisted of the following courses:

**University Practice:** A course in Academic, and Life Management and Skills. In addition to the standard content that is found in most Life Skills courses, lecturers also provided mentoring to students on a compulsory (once per term) and further voluntary basis. The content of the course was discussed on a regular basis with lecturers in other subjects to ensure it was integrated into their work. A full-time counsellor (in some years more than one) was appointed to work exclusively with students in UPEAP/UFP.

**English for Science:** The emphasis in this course was on reading, writing and speaking in the context of Science. One major focus in the course was on the analysis and interpretation of scientific texts. This was done in close co-operation with lecturers in the different Science subjects, who provided relevant texts for use in the English course. The course also included an integrated project in which students chose a topic from one of their Science subjects to research; wrote a paper and presented the project to fellow students and staff. The project was evaluated jointly by English, Science and University Practice lecturers.

**Computer Literacy:** Basic introduction to the computer, including file management, word processing, spreadsheets, e-mail and internet.

**Foundation courses in Mathematics, Physics, Chemistry and Physiology & Anatomy:** Topics from the Grade 10 to 12 school syllabus in each of these subject fields that has been identified as being important for successful studies in the BPharm degree.

**SUCCESSES IN UPEAP/UFP (PHARMACY)**
Access: From 2002 to 2006 a total of 140 students were provided with the opportunity to study in a Pharmacy direction through being admitted to studies in UPEAP/UFP (Pharmacy). From 2000 to 2007 a total of 113 students were admitted to the BPharm degree after completing the Pharmacy or Science programmes of UPEAP/UFP successfully in the previous year.

Success in year 1 of BPharm: As part of a broader study into the success of UPEAP/UFP, the performance of students who completed UPEAP from 1999 to 2002, and continued with BPharm studies, were traced in detail. For each student the success rate in each module in the first year of BPharm was determined. The table below provides a summary of the performance of these students:
SUCCESS STORIES

**Table:**

<table>
<thead>
<tr>
<th>Year in UPEAP</th>
<th># modules registered for</th>
<th># modules Cancelled</th>
<th># modules taken</th>
<th># modules taken but not examined</th>
<th># modules examined</th>
<th># modules passed</th>
<th>% modules passed / registered for</th>
<th>% modules passed / taken</th>
<th>% passed / examined</th>
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</thead>
<tbody>
<tr>
<td>1999</td>
<td>233</td>
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<td>12</td>
<td>639</td>
<td>36</td>
<td>603</td>
<td>431</td>
<td>66%</td>
<td>67%</td>
<td>71%</td>
</tr>
</tbody>
</table>

**Note:** This data was adapted from data gathered as part of a research project for a doctoral degree (as yet unpublished) by P Lithauer.

The table shows that ex foundation students entering BPharm during these years passed on average 67% of the modules they took in their first year of BPharm, and 71% of those in which they wrote the final examination. The corresponding percentage pass rate in examined modules for all students in the qualification ranged from 82% to 88%. While the ex foundation programme students performed somewhat weaker than the students admitted directly to BPharm, it must be kept in mind that the latter group includes a large number of students who completed their schooling with A and B aggregates.

Graduation: By the end of 2008 a total of 29 students from the 1999 to 2004 UPEAP cohorts have graduated with BPharm degrees. Two of these students have also completed Master’s degrees. An additional 37 ex foundation students are currently still busy with their BPharm studies. This implies that almost 60% of all the students who entered the studies for the BPharm after doing UPEAP/UFP have either qualified, or are still in the process of completing their studies.

The impact of the foundation programme on the BPharm programme at NMMU is further illustrated by the fact that 31% (11 out of the 35) of the current 3rd year BPharm class at NMMU and 24% (11 out of 45) of the current 4th year class, started their studies in UPEAP/UFP.

**REFLECTION AND THE WAY FORWARD**

The successes of the programme described above clearly show that the programme was successful in providing access to students who did not meet the standard admission requirements for entry into the BPharm degree. The programme also prepared these students for the demand of BPharm studies as shown in the pass and graduation rates. It was hence unfortunate that the DoE decided to only fund foundational provision in extended programmes, and the consequent decision by the NMMU Management to terminate the programme for financial reasons.
To ensure continued access to the earmarked funding the programme was replaced as from 2007 by an extended 5-year BPharm degree. While attempts were made to maintain the principles on which the foundation programme was based, it was not always possible. The foundational Life Skills, English and Mathematics courses were retained, but the foundational Physics, Chemistry and Physiology & Anatomy courses were replaced by extended versions of the relevant first year mainstream courses.

It is too early to determine at this stage if the extended BPharm will be academically as successful at UPEAP/UFP (Pharmacy), as the first students in this new programme have only joined students in the standard mainstream programme at the beginning of 2009. However one impact of the change that is already clear at this stage is that it had a negative impact on the number of students to whom access to BPharm can be provided via this route. The bigger academic demands of the extended mainstream courses – when compared to the previous foundational courses – implied that stricter admission criteria had to be put in place to ensure that only students with a reasonable chance of success are admitted. Where the average class size in UPEAP/UFP (Pharmacy) from 2002 to 2006 was 28 students, only 13, 18 and 10 students were admitted to the extended BPharm in 2007, 2008 and 2009 respectively.

REFERENCES


Foundation provision in Economics 1 at the University of Cape Town

Leonard Smith, UCT

INTRODUCTION
The Education Development Unit (EDU) in the Commerce Faculty at UCT runs academic development or foundational provision courses in economics. There are two mainstream courses in first-year microeconomics; the first-semester course (ECO1010F) and the second-semester course (ECO1010S). Most students doing ECO1010S have failed ECO1010F in the previous semester.

Five lectures are offered each day for four days a week to classes of numbering between 150 and 400 students. In addition students attend one single-period (45 minute) tutorial each week. Assessment is by means of two tests and an examination, which consist of multiple-choice questions only.

In general, academically disadvantaged students find it difficult to cope on these courses. The pace of the lectures, the lack of opportunity to practice and develop writing, learning, language and quantitative skills means that they struggle to make a success of these courses.

INTERVENTION
Two courses were developed for academically disadvantaged students requiring academic support. ECO1110H is designed for those students who cannot cope with the mainstream course even with some additional support. Generally, they require substantial additional support to develop their English language and quantitative skills. In addition to a double-period economics tutorial, students also attend a double-period language and communications tutorial.

The second support course, ECO1110F, is designed for those EDU students who are reckoned to have the ability to cope with the pace of the mainstream course given the appropriate educational interventions.

The chief interventions are the content of the double-period economics tutorials and the methods of assessment. Students are required to submit written answers to questions prior to the tutorials and to consider a variety of questions in the tutorial. Tutors are trained to facilitate the learning process of the students in their classes. In contrast to the mainstream economics courses students are required to answer structured and essay questions in addition to the multiple-choice questions. In this way they are encouraged to develop their writing skills.

 Students attend five lectures a week in a class that rarely exceeds 130 people. Usually the class size is closer to 100 students.
SUCCESS

ECO1110H and ECO1010S
The performance of African students doing ECO1110H is compared to those African students who repeated the mainstream course in the second-semester. The chief reason for using these students as a control group is that they too would have spent two semesters studying first-year microeconomics, and that both the ECO1110H and ECO1010S cohorts write the same final examination.

The results for these two cohorts for the period 2001 to 2005 are shown below.

In addition the performance of the two cohorts in the second-year microeconomics course (ECO2003F) is also described.

<table>
<thead>
<tr>
<th>ECO1010</th>
<th>ECO1010S</th>
<th>ECO1011H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>198</td>
<td>311</td>
</tr>
<tr>
<td>Pass examination first time</td>
<td>94</td>
<td>222</td>
</tr>
<tr>
<td>Percent</td>
<td>47.5</td>
<td>71.4</td>
</tr>
<tr>
<td>Pass course first time</td>
<td>124</td>
<td>255</td>
</tr>
<tr>
<td>Percent</td>
<td>62.6</td>
<td>82.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECO2003F</th>
<th>ECO1010S</th>
<th>ECO1011H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>116</td>
<td>255</td>
</tr>
<tr>
<td>Pass course</td>
<td>77</td>
<td>179</td>
</tr>
<tr>
<td>Percent</td>
<td>66.4</td>
<td>70.2</td>
</tr>
</tbody>
</table>

The ECO1110H cohort outperforms the ECO1010S cohort in both the first- and second-year microeconomics courses. These results suggest that the educational interventions incorporated in the ECO1110H course may improve the academic performance of students in the current and in subsequent courses in economics.

It should be born in mind that the EDU students have a lower level of academic ability compared to the ECO1010S cohort as measured by their performance in the matriculation examination.

ECO1110F and ECO1010F
The performance of African students doing ECO1110F is compared to those African students who did the mainstream course, ECO1010F.

The results for these two cohorts for the period 2006 to 2008 are shown below.

<table>
<thead>
<tr>
<th>ECO1010F</th>
<th>ECO1110F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>406</td>
</tr>
<tr>
<td>Pass examination first time</td>
<td>276</td>
</tr>
<tr>
<td>Percent</td>
<td>68.0</td>
</tr>
<tr>
<td>Pass course first time</td>
<td>297</td>
</tr>
<tr>
<td>Percent</td>
<td>73.2</td>
</tr>
</tbody>
</table>
The course pass rate for ECO1110F cohort exceeded that of the ECO1010F cohort by 12.3 percentage points. However, the mainstream cohort did very much better in the final examination. The chief reason for this is probably the exclusive use of multiple-choice questions in tests and the final examination. Thus mainstream students had more opportunity to practise answering this type of question.

It will be of great interest to track the performance of these two cohorts in second-year microeconomics to see whether the educational interventions embodied in the ECO1110F course payoff in the form of better performance in subsequent economics courses.
Financial Accounting/Financial Reporting at the University of Cape Town.

Carla Fourie, UCT

INTRODUCTION

I have been teaching Financial Accounting and Financial Reporting 1 to first year Academic Development Programme (ADP) students for nine years at the University of Cape Town. These students are generally from socio-economically disadvantaged backgrounds and fall below the minimum requirements for entry onto the mainstream.

The AD student group is diverse in terms of race, language, religion, culture, matric results and whether or not they have done Accounting 1 at school. Coupled with this diversity are disparities in terms of socio-economic and schooling status. The majority of students are further challenged by having to study in English which is not their first language. Taking these factors into account, I believe that if provided with appropriate support through varying teaching structures, each student accepted onto the ADP has the potential to succeed.

The greatest challenge when teaching is to be able to identify and create the appropriate environments in which a student’s potential can be unlocked and stimulated to enhance academic and personal growth, as well as meeting the objectives of the course curriculum and those of ADP.

Through the use of a range of pedagogies and teaching structures and through students’ interaction with their peers and myself, I aim to create a learning environment in which students know their rights and responsibilities, feel secure about themselves and are able to explore new relationships as well as their understanding of course content. Some examples of pedagogies and teaching structures used to achieve this are:

PEDAGOGIES

- Being aware of the academic and socio-historic diversities of the students and using ways to accommodate and affirm the students in the classroom.
- Being sensitive to the multiple languages that are spoken by the students and the challenges that the second language students encounter when engaging with the complex theoretical concepts and principles introduced in Accounting. Through informal conversation before and after lectures, an effort is made to get to know students and some of the experiences that they bring to the classroom. This is important to ensure that new content is presented in a context to which students can relate and that students are appropriately guided from the known to the unknown, building confidence to explore new content.
- Simple and accessible vocabulary is used to break down complex principals into language and context that is accessible, constructs meaning of the parts and then moves onto constructing meaning of the whole as demanded by the content being covered. Where appropriate students who understand a concept in English well are asked to explain their understanding to peers in their first language e.g. Xhosa. The use of code switching is an effective tool to unlock a student’s
understanding of a concept first in their own language, and then to work with the student to convert this understanding into the demands of English first language.

- Questions asked by students create valuable learning opportunities. Students are rarely given the answers. Rather, a high order questioning technique is used as a mediation tool to guide students from a question to the answer. Students are challenged with questions that encourage them to access and think about existing knowledge and to use this to construct new knowledge.

- Group work is used frequently in the large group lectures as a way of encouraging students to interact with the diversity in the classroom in order to enhance personal growth, as well as providing a space where the student voice influences learning and is challenged by peers.

- Informal assessment is invaluable in that it gives immediate feedback of where a student “is at now” in the course. A number of methods to informally assess students are used. Sometimes during a lecture students are asked to write down what they have just learnt or what they understand about a concept or term or how they are feeling at that moment about the work being covered. Sometimes a question is posed at the beginning of a lecture addressing work that was learnt the previous day and students are asked to discuss the question with a partner. Vula, UCT’s online web interface for communications, is an effective tool to use to pose questions for students to think about and then discuss in the next day’s lecture. At the end of a lecture sometimes two to three students are selected and asked to write down their responses to a short question from content learnt during the lecture. Directly after the lecture, the question and answers provided by the students are posted onto Vula and the rest of the class is invited to consider the answers given. Students’ responses are used as an opening discussion in the next day’s lecture. To encourage class participation coupled with students being active in their own learning, names on the class register are selected and these students are asked to prepare certain basic research tasks based on content that is going to be covered in future lectures. Their input is then included at the appropriate time.

- It is imperative that throughout the delivery of the curriculum, the student voice is heard. Students evaluate the course formally and results of this are discussed in the large group lecture between lecturer and students. Students value this exercise and appreciate that their comments are being taken seriously and this often leads to further valuable input and responses from students. Informal feedback is received from students through discussions before and after lectures and support forums, during tutorial sessions, during one-on-one consultation, via e-mail and through impromptu and informal written comments that may be requested during time spent with students. Student feedback is imperative and invaluable in reassessing and evaluating teaching practice within the various teaching structures.

TEACHING STRUCTURES
Students learn in different ways and so it is important to provide a variety of teaching structures/environments outside of the large group lectures that provide opportunities for students to engage with content in their way. Due to the huge diversity of the AD class, I have found that teaching structures need to be re-evaluated and changed to suit the learning needs of individual cohorts and the changing student body and cannot remain constant from year to year. The opportunity to investigate and create alternative environments to meet the needs of student learning provides a valuable learning experience for me in that I am constantly challenged to think about teaching and learning in different ways and to create spaces that are effective in enhancing student learning.
Various teaching structures provided within a course should feed into each other and, while providing support in alternative ways, clearly integrate the course objectives between them.

Alongside the large group lectures, students are required to attend small group tutorials and are also provided with optional support forums as described later.

- **Small group tutorials (6 to 12 students in a group)**
  
  **Tutor Training**
  At present I have a total of six tutors and twelve tutorial groups on each course that I convene. I spend a great deal of time sourcing student tutors from senior AD cohorts studying Accounting as their major. Not only do students apply for the position of tutor out of their own interest, but I am constantly on the look out for students from the first year of study who I believe have the academic and personal attributes to be effective role models and tutors in their senior years at university. I keep track of their academic record until they are in a position for me to invite them to apply for a tutoring position and to give them the opportunity for development and growth in a leadership position. Tutor training is mandatory and is usually over a period of two to three days. I run the tutor training myself and link it closely to the objectives of the tutor review process as described below.

- **Tutor Review**
  Over the last 5 years I have developed and continue to refine a tutor review process which aims to continually train and evaluate tutors while carrying out their duties. At the beginning of 2005, I stopped tutoring formally each week in order to investigate what was happening in tutorials. I was looking for two main things: Was the tutor sufficiently equipped for his/her role and was there evidence to suggest that the students' learning was being enhanced by the tutor.

  To answer the above questions, I wrote down in detail what I witnessed in a tutorial and gave oral and written feedback to the tutors. I wanted through this process (which became known as the tutor review process) to create an environment of accountability. Candidates for tutoring positions were told at the outset about this review process in which they would have to participate. The methods used were not intended to create a threatening environment for the tutors. Rather, in an honest and supportive way, I set out to equip the student tutors with skills necessary for their positions and to focus on their self development. Through continuous “on the job” tutor training, I aimed to further develop, add to and refine their skills as student tutors in the hope that these skills would not be limited to the tutorial environment at university but could be transferred and applied in their workplace in the future.

  I believe that this process of review has added tremendous value to the tutor as an individual, the students being tutored and the course itself. The process not only provides immediate feedback to tutors on their performance but also allows me to evaluate how the tutorial “space” is used and what needs to be put in place to improve tutorial delivery, as well as, giving me an indication of how students are responding to the tutorial system and the course as a whole.

  Tutors are given further ongoing support through detailed written tutor guidelines and weekly meetings. Each week, tutors are required to e-mail me feedback on the week’s tutorial sessions. This is an invaluable exercise as it provides feedback on tutor experience as well as how students
are responding to and coping with course content and allows for student issues to be identified and
dealt with appropriately in the alternative teaching structures.

- **Learning Channel Live**
The *Learning Channel Live* sessions are based on television Maths and Science programmes in
which the host answers students’ telephonic questions regarding the subject. In my initiative,
students are required to prepare questions for the sessions. These questions must be based on
work that has been covered up to the point of the session being held (i.e. lectures, tutorials,
textbook readings). Attendance at the sessions is voluntary unless I feel, through consultation with
a student, that extra support is required and attendance for that student is made compulsory for a
period of time. Student evaluations indicate that the initiative is valuable and gives students the
opportunity to be actively involved in, responsible for and committed to their own learning process.

- **Head Space**
I introduced this support forum by asking students the rhetorical question, “where is your head in all
of this?” The Head Space sessions address various issues around course content, feedback on
tests and any other pertinent issues that students may raise over the semester.

**SUCCESS OF THE ADP COURSES**
The following table shows the comparative results between academic development (AD) and mainstream
students from 2001-2008 in Financial Accounting and Financial Reporting 1. The results reflect pass rates
for students who wrote the final examination and completed the course in the given year. Results do not
include supplementary examinations. It is important to note that the majority of students registered on the
AD programme do not meet the requirements for mainstream in terms of their matric point status, indicating
a lower level of academic preparedness than their mainstream counterparts. Having said this, ADP
students are required to complete the same curriculum as mainstream within the same time period i.e. over
one semester for each course represented below.

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial Accounting (AD)</strong></td>
<td>*78%</td>
<td>*84%</td>
<td>85%</td>
<td>85%</td>
<td>84%</td>
<td>92%</td>
<td>98%</td>
<td>97%</td>
</tr>
<tr>
<td><strong>Financial accounting (Mainstream)</strong></td>
<td>*71%</td>
<td>*57%</td>
<td>79%</td>
<td>86%</td>
<td>81%</td>
<td>88%</td>
<td>94%</td>
<td>90%</td>
</tr>
<tr>
<td><strong>Financial Reporting 1 (AD)</strong></td>
<td>Did not teach</td>
<td>66%</td>
<td>88%</td>
<td>83%</td>
<td>99%</td>
<td>96%</td>
<td>90%</td>
<td>93%</td>
</tr>
<tr>
<td><strong>Financial Reporting 1 (Mainstream)</strong></td>
<td>N/A</td>
<td>77%</td>
<td>89%</td>
<td>59%</td>
<td>97%</td>
<td>97%</td>
<td>92%</td>
<td>91%</td>
</tr>
</tbody>
</table>

It is clear from the table that students who would be expected to perform poorly have, with the addition of
academic support to their curriculum, outperformed their better prepared counterparts.
Success in foundation at the University of Limpopo

Moloko Sepota, UL

INTRODUCTION

The University of Limpopo runs five Extended Degree Programmes (EDPs) in the Faculties of Humanities, Management Sciences & Law and Agriculture & Sciences. These EDPs involve the following programmes: BA Media Studies, BA Social Sciences, B Comm Accounting, LLB and BSC. The BSC EDP is not covered in this document. In the first four programmes, the first year is extended over a period of two years during which the mainstream workload is slightly reduced. In addition to the mainstream modules, enrichment modules (aimed at improving the student’s generic skills) are offered to the students in the EDP.

THE INTERVENTION

The EDPs are meant for those students who are identified as being likely to struggle with their studies. Such students will not register for their full mainstream load during their first year of study and in addition to the mainstream modules they shall have registered, they will also register for enrichment modules during their first two years of study. Enrichment modules supplement mainstream modules so that even these students do roughly 120 credits a year. The under-preparedness of the students is addressed by modules such as Life Skills (FLSK), Basic Numeracy (FBNU), English for Academic Purpose (FENG), Creative and Critical Thinking (FCCT), Multilingual Academic Literacy (FMAL), Social Sciences Concepts (FSSC), Research Skills (FRSK) and Computer Literacy (FCOL). The focus of all these modules is the improvement of generic skills that are required in order for the candidate to cope with the arduous demands of tertiary institutions. What influenced this type of a model was a paper written by Prof Scot (2001) of UCT in which he argued that students at risk (under-prepared students) need both more time and more tuition.

Our experience during the past years is that the drop-out rate is high. The main challenge with this issue is that, it is very much difficult to say with certainty what the major cause is. There are a number of possible causes like; failing, financial difficulties, transferring to other institutions, the scourge of HIV/ AIDS, just to mention but a few. It is not always easy to trace such students because the majority of them do not provide correct addresses on their application forms.

The EDP basically aims to provide struggling students with reasonable chances of success. Its introduction had a serious impact on the university admission policy. It is now, for instance, a university policy that testing is administered to all first entering university students. Besides the change in policy matters, the introduction of the Extended Degree Programme itself, shows some form of curriculum changes.

DESCRIPTION OF SUCCESS

In all four cases examined EDP students outperformed mainstream students studying the same subjects. Foundation students are those who have lower formal entry qualifications than mainstream students but who the university believes can succeed if they are given enough help. The following figures are from the programme over the last few years. Foundation students study the same subjects as mainstream but receive academic support which replaces some mainstream subjects.
SUCCESS STORIES

One can safely say that EDPs have had a positive effect at UL. The success in this case can be presented and explained in quantitative terms as follows:

In BA Media Studies (EDP), the pass rate for the foundation students ranges from 80 – 100% in the four mainstream modules as compared to 55 – 93% pass rate by the mainstream students.

In BA Social Sciences (EDP), the pass rate ranges for the foundation students ranged from 95 – 100% in the three mainstream modules as compared to 39 – 40% pass rate by the mainstream students.

In B. Comm Accounting (EDP), the pass rate for the foundation students ranges from 79 -94 % in the mainstream modules as compared to 77 – 86 % pass rate by the mainstream students.

In LLB (EDP), the pass rate ranges from 42 – 81% (Unfortunately we did not manage to obtain the actual statistics from the mainstream students in this case, but we are told, there is an improvement in the EDP performance).

REFLECTIONS AND WAYS FORWARD

There are still serious challenges regarding the smooth and effective running of the EDPs. These are some of the challenges:

- **Stigmatisation**
  Students who are attached to this programme are seen as slow learners by other students and at times even members of staff. One possible solution to this could be the introduction of the EDPs as the norm and let the current mainstream degree serve a special programme for the high flyers.

  On the other hand, members of staff who are attached to EDPs also do not enjoy full recognition by some of their colleagues, probably because they are, relative speaking, junior staff members who are on contract or even part-time basis. As a result, integration and communication between them and the mainstream staff members is lacking. This is not a healthy situation if the EDPs are to achieve their intended goal.

- **Finances**
  Due to the fact that staff members in the EDPs are paid from the DoE funding (which is based on a three year cycle), it is extremely difficult if not impossible to appoint them permanently. As a result, those who teach in these programmes are forever looking for permanent position elsewhere. At times in some programmes, institutions are forced to replace tow educators in one programme. This might explain the performance of EDP students in B.Comm Accounting. It is also difficult to plan and or train staff members who are in transit. One possible solution to this could be for the DoE to consider making foundation funding permanent so as to employ staff members in the EDP on a permanent basis.

CONCLUSION

Generally, EDP students are performing better than mainstream students. It is also important to mention that students in the EDPs are very few and thus manageable. This could also explain the better performance by EDP students as compared the large classes of mainstream students.
Foundation programmes at Tshwane University of Technology: “a success story with a difference”.

Steven Painter, TUT

INTRODUCTION
In 2004 the Department of Education (DoE) offered formal funding for Foundation Programmes (FP) at South African institutions of Higher Education (HE) for the first time. Tshwane University of Technology (TUT) started planning an application which was approved and in January 2005 started offering generic year FP’s in the faculties of Science, Engineering and ICT. These were non-credit bearing but very comprehensive in nature. This article is an analysis and discussion of the follow up study for the first intake of students in the FP for Science in 2005, using student records to end of 2008.

STRUCTURE
The FP consisted of eight subjects, four of which were generic to all FP’s, these being Mathematics, Computer Literacy, English and Life Skills. The different FP’s then also had four subjects specific to the faculty, for Science these were Chemistry, Physics, Laboratory Skills and Introduction to Natural Sciences. The Computer Literacy was comprised of an introduction to hardware as well as word processors, spreadsheets, internet and e-mail, databases and presentations software. The Life Skills was focused on health and wellness issues, stress, time and study management, basic financial management. The laboratory skills covered basic safety in a Physics, Chemical and Biological laboratory as well as mainly measurement and basic manipulation skills. None of the subjects were credit bearing, apart from Computer Literacy and English for certain qualifications where credit (or recognition for the subject) could be applied for. The eight subjects had several written and practical assessments during the course of the year leading to a year mark which then counted 50%, with the other 50% being the final written or practical examination combined to get the final mark. Initially, it was stated that a student had to pass all eight subjects to continue, but due to the limited numbers of students achieving this, exceptions were evaluated on merit. There were two separate intakes for the 2005 Science FP, at the Soshanguve and Arcadia campuses. The selection procedures for the two groups were different (Arcadia group had additional psychometric testing to identify students with potential for success, based on previous experience) as well as the follow on results and so the groups have been analyzed separately. The Soshanguve intake were a group of students who did not meet the minimum requirements set by the various departments within the faculty, but nevertheless had passed mathematics and physical science at the grade 12 level, albeit with the minimum mark.

RESULTS
Unfortunately, one has to start with the most negative factor impacting on both the Arcadia and Soshanguve groups, and that is the high rate of attrition within and directly after the foundational year. This is 39% for the Arcadia and 60% for the Soshanguve groups. This represents the overall dropout of students who did not continue with HE studies at TUT after the foundation year for whatever reason. A major contributor to this would most probably be financial reasons (based on written and oral feedback from the students during 2005). Scott’s cohort study of 2007 (Scott et al, Higher Education Monitor, 2007) indicates average attrition at Technikons in South Africa after the first year at 34%. This figure is consistent with the
Arcadia group. The Soshanguve group attrition is particularly high, probably mainly due to financial or merger related factors (students continuing with study could only do so at the Arcadia or Pretoria campuses) or poor initial selection of this group of students.

Moving on from these rather disappointing figures, the picture improves remarkably if one looks at the average Student Success Rates (SSR) over the 3 years of study following the year of foundation. These are defined as credits achieved divided by total credits registered and expressed as a percentage and are 83% for the Arcadia and 85% for the Soshanguve groups. This compares favorably to the average SSR of 70% for students studying in the Science faculty in the same period and also satisfies the DoE benchmark of 80%. In addition to these positive results, 29% of the Arcadia and 21% of the Soshanguve group have effectively completed their qualifications within the minimum time. These percentages are not based on those students who continued with study but the total group who entered the institution in 2005. If one revises the calculation of qualification completions to only those who continued after 2005 the figures change to 45% for the Arcadia and 40% for the Soshanguve group. These results compare favorably with the results of a cohort study (Scott et al, Higher Education Monitor, 2007) of the intake at HE institutions in 2000 and their subsequent progress to end 2005. The figures quoted as an average for Technikons (contact) in South Africa give graduation after 5 years as 32%. This is for a 3 year diploma (2 additional years) whereas this study is over 3 years. Taken in this light, it seems clear that the effect of the year foundation programme, despite not being credit bearing, has been extremely positive on the lives and careers of those students who remained at the institution.

CONCLUSIONS

There are a great many factors which influence the success of a student in Higher Education and almost as many debatable viewpoints about what should be done to improve the graduation, success and participation rates for HE amongst our youth. The results of this attempt by TUT to support students in the Science faculty in their studies are very positive, especially considering that this was the first year of implementation of the FP. It seems from the results that a generic, non credit bearing FP can yield the desired success rates while it also shows that additional financial support for students would also yield positive results. Essentially, if TUT could have just retained a higher percentage of the 2005 intake then the number of graduates and the success rate would have made a fantastic success story. This is then a success story with a difference, and the lesson we can learn is to select students with potential and support them more to enable them to come through with flying colours. Perhaps the greatest success of the FP as well as this evaluation of one of its cohorts lies in the valuable knowledge and experience generated by the exercise.
Success of foundation (extended programmes) in Engineering and Sciences

James Garraway, CPUT

CPUT experiences an overall diploma throughput rate of about 26% within the given time of three years. In addition less than 50% of our students eventually graduate and more than half are lost from the system. Most of the losses (drop-out) occur at the end of first year. Throughput rate is also racially skewed in that only 17% of African students graduate within the given time. In addition, the throughput rate in Engineering is much lower, at between 10 and 15% depending on the programme. Retention after first year is also

Although our graduation rates and retention are comparable to, and often better than, the other universities of technology, they are still a cause for concern, particularly for previously disadvantaged students. In order to help remedy this situation the institution applied for government funding for extended programmes with academic support (often also called foundation provision) for the 2007 –2009 cycle. There had been some one year foundation programmes before this time. Some students who would not have previously gained access to the university were now accepted and some of these students have graduated, though not in the numbers that the original designers had hoped for.

The current extended programmes involve mostly the extension of the first year into two years. In general, students study half the regular subjects in year 1 and the other half in year 2. Within each year, the study of the regular subjects is supported through more intensive teaching of the subjects and through linking them to additional courses in language and numeracy. Intensive teaching may involve interventions such as: A focus on conceptual development; integrated projects across all subjects; multilingual exercises; scaffolded reading in which students are taught to read and write within that field and so on. A typical example of how a subject in the extended programme is intensified and hence extended is shown in table 1.

<table>
<thead>
<tr>
<th>Regular curriculum for the Analytical Chemistry programme</th>
<th>Additional, intensive support material in the extended programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matter and Energy, elements and compounds, metals and non-metals, gases, liquids, solids; Atomic Structure, models of the atom orbitals and electronic structure; Periodic table; Chemical Bonding, compounds; Introductory inorganic chemistry, chemical reactions, nuclear chemistry; Stoichiometry, the mole concept and calculations; Solutions.</td>
<td>Factory visits (e.g. water purification plant) and guided project write ups; Authentic case studies to promote problem solving; Scaffolded reading of the chemistry text book as an introduction to every topic; Multilingual problem-solving; Peer marking of once-weekly problems; Authentic, integrated, group PBL tasks; Practical investigations, using household chemicals e.g. vinegar, bicarbonate of soda, soap etc. to investigate properties of acids and bases.</td>
</tr>
</tbody>
</table>

Table 1: Regular and extended curriculum in Analytical Chemistry
Students are usually taught by specialist staff who undergo some training in the nature and purpose of the extended programme and in how to promote student engagement and academic support. The model is decentralised with student selection and course management being situated in the faculty and departments and training, support, policy and oversight coming from a central higher education unit.

Student selection varies but in general students who fall into the lower portion of the automatic acceptance, or who are borderline/waiting list students, are offered places on the extended programme. Some regular programmes also advise students who are struggling in term one in the regular programme to re-register for the extended one. Others use tests such as the SATAP tests to counsel students onto the extended programme prior to registration.

There are currently approximately 800 students in years 1 and 2, with numbers expected to increase in the new 2010 cycle of funding. At the time of writing, the first cohorts of extended programme (EP) students were studying their first year without support (regular year 2) but no figures were available on their attainment level. It was, however, possible to compare the average achievement of the first year foundation group and that of the regular first year group of students.

Tables 2 and 3 compare the ratio of credits registered for divided into credits passed represented as a percentage. The figures are otherwise known as percentage FTE pass rates. As the EP students are studying half their regular first year subjects with the rest of their learning load made up of support for these subjects, it is possible to make the comparison between them and the regular students.

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
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<tr>
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Table 2: Comparison of percentage FTE pass rates between regular and EP students in year 1 in Engineering

<table>
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<tr>
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</thead>
<tbody>
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</tr>
<tr>
<td>Nature conservation</td>
<td>84</td>
<td>85</td>
</tr>
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</table>

Table 2: Comparison of percentage FTE pass rates between regular and EP students in year 1 in Applied Sciences.
As already indicated the extended programme students are already borderline for admissions onto the regular programme. We would thus expect this borderline group to constitute the lower achieving group of the class as a whole, in general falling well below the average pass mark.

In some cases the EP students are under-performing compared to the regular students and this is particularly the case in 2007 in programmes such as Building, Horticulture and Nature Conservation. However, these programmes show much improvement in 2008. In general there is only a slight difference between the % FTE pass rates of the regular and the EP groups. Student achievement in the two groups is quite similar despite initial differences at entry.

The comparative figures for % FTE pass rates suggest that the extended programmes are improving student success and retention, at least while students are on the support programme. The real proof of success will only come when we examine the throughput rates of the first cohort of extended students to graduate at the end of 2010. before this time we will also be able to see how well the extended students have fared at the end of 2009 after having completed their first year without additional academic support.