



## TAU PROJECT

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Study title: Promotion rates of mainstream students in the School of Physical and Mineral Sciences: A cohort analysis

### Abstract

There is an ongoing debate about the status of the matric results as a predictor of success in higher education. The University of Limpopo has since raised the bar for entry into its programmes due to a high failure rate of students at undergraduate level. However, the School of Physical and Mineral Sciences did not have adequate information on the promotion rates of mainstream students in the three-year degree programme.

In this study, students' records were used to track students' performances from first year in 2013 to third year (in 2015) taking their matric scores into consideration.

The study showed that 71% of the 2013 cohort of students were promoted to their second year of study. Of these, 42% passed matric with a Mathematics score of 5 and above, whilst 28% of them obtained a 4 in matric Mathematics.

Ultimately, the promotion rate figure declined to 12% and 9%, respectively, at third year level. Statistical analysis will be used to establish the extent to which tertiary education should pay attention to entry qualification.

### Introduction

In this study, the objective was to determine the promotion rates of the 2013 cohort of mainstream students in the School of Physical and Mineral Sciences in the Faculty of Science and Agriculture at the University of Limpopo (UL). The mainstream programme under study was referred to as the Bachelor of Science in Physical and mineral Sciences (BScCO1). The study also sought to ascertain from the students' academic records in what ways raising the admission requirements bar in the School of Physical and Mineral Sciences would or would not help them in their degree studies. The School Physical and Mineral Sciences raised the entry requirement bar in 2016 to improve student success rates and to be on par with other institutions, because the school's requirements were too low compared with those at other universities. However, there is strong evidence that a good matric score does not necessarily translate to academic success in higher education (HE) (Van Eeden, De Beer and Coetzee, 2001; Grussendorff, Liebenberg & Houston, 2004, etc.). In addition, the NSC pass rate does

not take into account the number of learners who fall through the system ending up not making it to matric (Van der Westhuizen (2013)).

Effective admission criteria should identify candidates whose likelihood of success is without doubt. It should minimize both the number of candidates who gain access but fail and those who do not gain access but would have been successful had they been admitted (Zaaiman et al., 2000). As a result, National Benchmarking Tests (NBTs) have been designed to provide criterion-referenced information to supplement the National Senior Certificate (NSC) (Yeld, 2009, Prince 2010, Wilson-Strydom 2010a; Wilson-Strydom 2010b). They are comprised of three levels (i.e., the basic, intermediate and proficient levels). Students who performed at basic level experience serious learning challenges. They cannot cope with degree level study and would be referred to FETs. Currently, UL does not use NBTs scores. Thus far, data analysis has shown that the majority of the candidates who sat for the matric exam in 2008 were in the basic categories in respect of their academic literacy. In addition, the overall analysis on programme level profiles (mainstream, extended and bridging programmes) of first-time entering students' NBTs results at TUT advocated for the introduction of the flexible undergraduate curricula (i.e., a four-year undergraduate degree).

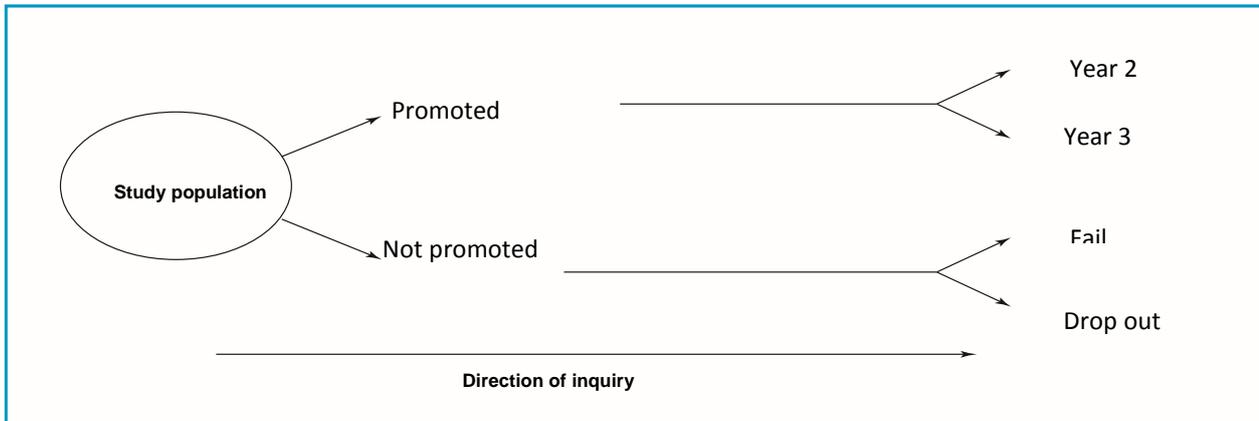
Currently, the school does not have adequate information on either the promotion rates of mainstream students with high matric scores (any score that is greater than 4) and those with low scores (score less than 5) in the normal three-year degree programme or the promotion rates of students with high matric scores in other institutions of higher educations. Thus, there is no information to suggest different levels of success among students with high matric scores and those with low matric scores, particularly in Mathematics, at the University of Limpopo (UL).

Therefore, the main aim of the present study was to determine the promotion rates of the 2013 cohort of BSc mainstream students in the School of Physical and Mineral Sciences. In addition, the study reported on a single variable, performance in matric Mathematics, and its association with the students' promotion per study level. This will serve as a base for detecting challenges faced by students at different study levels. This would also assist the school in identifying areas of concern along the degree path.

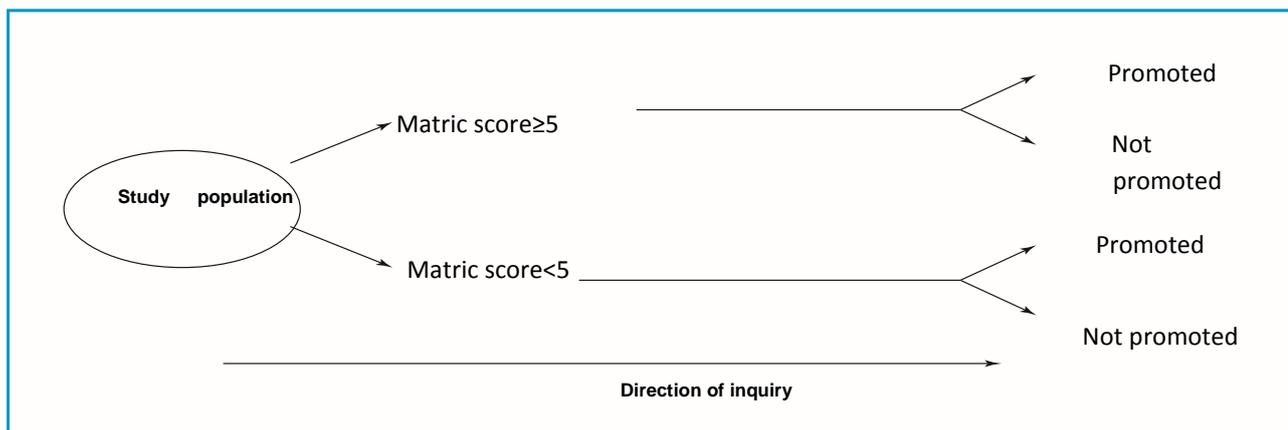
## **Methodology**

In this investigation, purposive sampling was employed as it targets a particular group of people who meet certain characteristics. In addition, the techniques answers the research questions. Cohen et al (2000) argue that this type of sample is economic to research although it can seek only to repeat itself in a similar population.

The dataset comprised the scores of all the modules of 139 cohorts of students who enrolled for the BScC01 programme in 2013 and whose matric scores were available. For a student to be eligible for promotion from one level to the next, they should pass 75% of their modules, including students with carry-over modules. Then, their promotion was linked to their matric Mathematics to establish a correlation. Ultimately, their promotion rates per study level were tracked from 2013 to 2015 using the schematic diagrams shown below.



Outline of the cohort study 1



Outline of the cohort study 2

In the main, data were analyzed using the Excel Software package with special attention paid on whether the students were promoted, not promoted from level to level or dropped out.

## Findings

The study focussed on the students whose matric scores were available at the time of data collection. Out of a total cohort of 215 students who enrolled for the BScC01 programme in 2013, 139 (65%) students' matric scores were available.

The study showed that about 70% of the 2013 cohort of students were promoted to the second year of study (see figure 1a below).

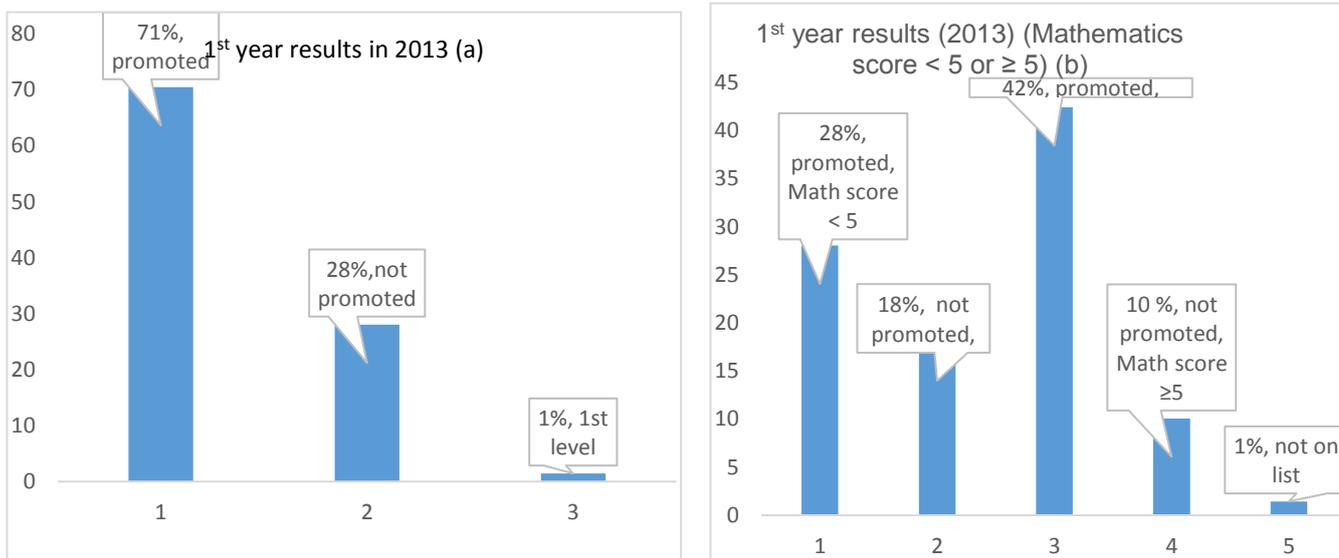


Figure 1 Promotion rates of first year students in 2013.

Of these, 42% (see Figure 1b) passed matric with a Mathematics score of 5 and above, whilst 28% of them obtained a score of less than 5 in matric Mathematics. Thus, Figure 2 shows somewhat the anticipated trend in which performance is best for the students with good matric Mathematics scores giving an impression that there is an association between performance in matric mathematics and academic success at institutions of higher learning.

Performance data for the students with high and low scores in matric Mathematics in their third level of study was also tracked. These are shown in Figure 2 below.

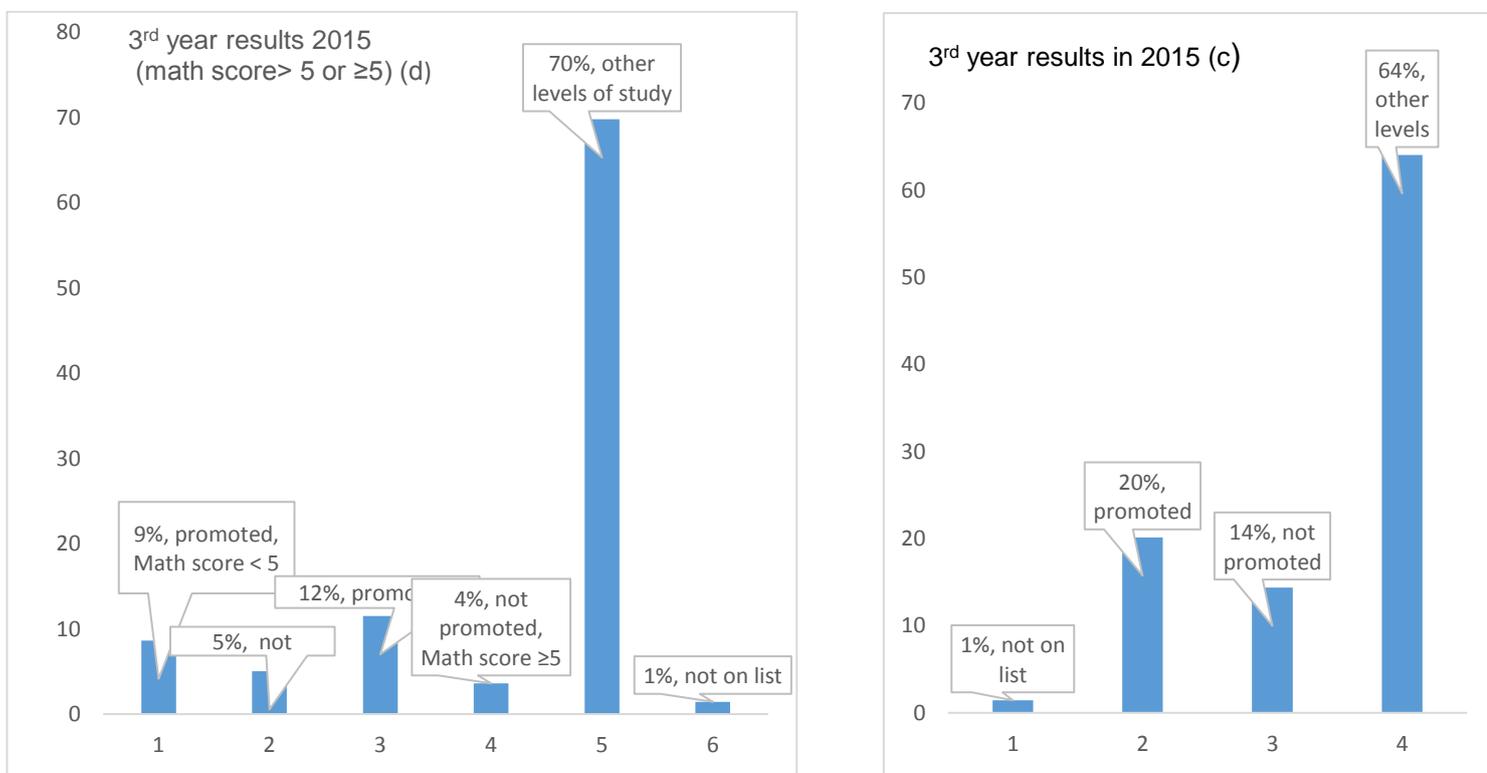


Figure 4.9 Promotion rates of year 3 students in 2015 with respect to their matric scores (Mathematics score < 5 and Mathematics score ≥ 5).

As shown in Figure 2 above, about 10% of the initial 2013 cohort of students graduated in regular time. This figure is almost similar in the two groups of students (those with matric Mathematics score of 5 and above and those with matric score below 5). This implies that the matric Mathematics did not serve as a predictor of academic success in HE institutions. However, this figure is also too low compared to the national figure of 30% graduation rate (Scott, Yeld, and Hendry 2007). Seventy-percent (70%) of the students were still at lower levels, whilst 10% of the 2013 cohort of students were not promoted at level 3.

On the whole, the results indicated that the matric Mathematics score is associated only marginally with their ultimate promotion status, graduation in this case, at third year level. Hence, there is no definite correlation between matric mathematics and academic success in HE. Thus, although the results at first year seemed to suggest otherwise, ultimately, the promotion rate figure declined to 12% and 9%, respectively, at third year level.

However, the study did not look at the effects of other variables that could influence student success at tertiary level. These include: facilitation methods of teaching and learning, access to learning materials/ICT, learning space/infrastructure, accommodation, family background, access to NSFAS funding, gender, rural/urban divide, etc. Going forward, the School of Physical and mineral Sciences has to pay more attention on teaching and learning effectiveness rather than on raising the entry requirement bar. Areas of challenges to students could easily be identified from the student data profile as most students seemed to spend most of their study time at second year level (about 70% of the initial cohort).

## References

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