



## DMISRS Project and Symposium

### The Diagnostic Mathematics Information for Student Retention and Success (DMISRS) Symposium

The collaborative DMISRS Project, run by CETAP and with Robert Prince as

principal investigator, aims to facilitate academic success and reduce attrition in South African Higher Education by analysing the curricula of first year Mathematics courses in order to establish how best to address students' needs through curriculum-integrated support initiatives.

In July, the first DMISRS Symposium was held, during which mathematicians and other academics from across the country discussed the diagnostic potential of the NBTs for Mathematics curriculum change, as well as issues in teaching and learning of Mathematics.

For more information about this project, visit the project [website](#).



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### NBT-by-numbers



Facebook followers



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NBT Reports distributed

# Conference attendance



CETAP's Director, Naziema Jappie, Test Coordinator, Robert Prince, and Statistician, Darlington Mutakwa attended the 11th Conference of the International Test Commission from July 2-5, 2018 in Montréal, Canada and presented the following papers:

***The preparedness of the African home language speaking students for university: insights from the national benchmark tests:***  
**Naziema Jappie; Darlington Mutakwa**

## **Abstract**

South Africa, like many other developing countries has been trying to improve university graduation rates for decades. One way to improve these rates is to understand how prepared the students are to cope with the demands of university. Much research has looked at the overall student readiness for university, with very little attention being placed on the differences in preparedness of students coming from the different indigenous South African languages. South Africa recognises 11 official languages, 9 of them being indigenous African languages. This study sort to explore the level of readiness for university studies for students with one of the 9 African home languages. Understanding the preparedness (or lack thereof) of potential students based on their home language contributes to the development of targeted interventions, which in turn improve graduation rates. The study drew insights from the National Benchmark Tests (NBTs). The NBTs were designed to assess the level of preparedness (i.e. in Academic Literacy, Quantitative Literacy and Mathematical Literacy) of students intending to enrol in Higher Education Institutions. The data was drawn from 2015, 2016 and 2017 cohorts of NBT writers. All analysis was conducted in STATA 14 software. Regression analysis, Analysis of Variance and Chi-square tests were used to determine the relationships between home language and NBT performance. The results showed that there was a statistically significant relationship between the African home language and the level of preparedness for higher education studies. The level of preparedness varied across the NBTs as well as the home languages. Overall, majority of the students with an African home language were underprepared for university studies. This study contributes to the development of targeted interventions which will improve the graduation rates for previously disadvantaged students.

# Conference attendance (cont.)

***Assessment of mathematics learning potential: the mathematics comprehension test: Robert Prince; Jurie Conradie; Darlington Mutakwa***

## **Abstract**

The importance of the role of learning potential in higher education is increasingly being recognized. Many academic disciplines make significant demands on students' mathematical practices. Quantitative disciplines, such as Engineering and Sciences, also make complex demands, for which traditional school-leaving mathematics courses do not always prepare students adequately.

This paper focuses on the Mathematics Comprehension (MCOM) test. The MCOM test is one of two tests of academic potential developed and run by the Centre for Educational Testing for Access and Placement (CETAP) at the University of Cape Town, South Africa. The purpose of the MCOM test is to assess a student's ability to engage with and respond to teaching of new mathematical concepts. Two topics not covered in the school-leaving Mathematics curriculum are introduced in the test. The topics are chosen in such a way that there is minimal dependence on the mathematics taught at school level. The test material based on these topics are interspersed with questions on the concepts introduced, in the style of a traditional comprehension test, in this way attempting to assess a student's understanding of what she or he has read and understood or mastered. The questions range from very easy to more demanding applications of the new ideas introduced in the test.

The study, using categorical methods, tracks two Bachelor of Science student cohorts for three years and looks at proportions of the cohort which completed the degree in minimum time. The study goes on to track these cohorts for a further year. As a result, this study focuses on graduation rates at minimum time (3 years) and minimum time plus one year (4 years).

The results in this study shows that there is a statistically significant relationship between the MCOM test scores and graduation in minimum time and minimum time plus one year.

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# Conference attendance (cont.)

## ***Institutional Effectiveness in Fostering Student Retention and Success in 1st Year: Naziema Jappie; Darlington Mutakwa***

The aims of higher education in South Africa are clearly set out in Education White Paper 3: A Programme for the Transformation of Higher Education (1997), which states that higher education has to meet the learning needs and aspirations of individuals, address the needs of society and provide for the labour market. This in turn contributes to the constructive and responsible citizenship that ensures the creation, sharing and evaluation of knowledge. However, equal opportunity for access to education is an important concern, particularly as education is associated with economic outcomes, democratic participation and personal well-being. Access, retention and throughput of previously disadvantaged students are critical issues at universities in the South Africa. These issues play out against the historically differentiated basic and higher education systems. Higher education institutions in South Africa share this common past, but have dissimilar characteristics related to their local contexts, the communities they serve, their staff profiles, and their access to resources and culture. Accordingly institutions face both common and specific challenges. This paper explores the school to university readiness characteristics including entrance assessments scores that determine risk for retention and success after first year. These relationships are investigated and explained with a literature discussion and analysis of data that includes assessment scores for university readiness, student transition and interventions for retention. This emanates against the challenges that the South African Higher Education is exposed to, as well as the demands placed on the Faculty Commerce at the University of Cape Town, to meet the high demand for well-equipped professionals.

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## Conference attendance (cont.)



Naziema Jappie (middle) with Penny Burke University of Newcastle Australia (left) and Ronelle Carolissen (Stellenbosch University)

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Naziema Jappie attended an international colloquium entitled, “Gender, post-truth populism and pedagogies: challenges and strategies in a shifting political landscape” and hosted by the International Gender, Social Justice and Praxis Network and the Centre of Excellence for Equity in Higher Education.

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## NBT workshop at VUT



Vaal University of Technology

*Your world to a better future*



This month, CETAP’s research leads, Sanet Steyn, Pragashni Padayachee, and Benita Nel, led the first of what is to be a series of workshops about the NBTs with academics at the Vaal University of Technology (VUT).

Academics at VUT are interested in the diagnostic potential of the NBTs and are looking forward to working with CETAP to ensure that it assists with curriculum development.

# Publications

A paper by Vera Frith and Robert Prince has been published in *Numeracy*:

The National Benchmark Quantitative Literacy Test for Applicants to South African Higher Education. *Numeracy*, v.11(2), 2018.

## Abstract:

The National Benchmark Test Project (NBTP) was commissioned by Higher Education South Africa in 2005 to assess the academic proficiency of prospective students. The competencies assessed include quantitative literacy using the NBTP QL test. This instrument is a criterion-referenced multiple-choice test developed collaboratively by South African academics and provides complementary information to that provided by the norm-referenced school-leaving examination. In this paper we outline the theoretical framework that provides the foundation for the NBTP QL test and describe the test construct. In the QL test specifications, there are three dimensions specified for each item: the competencies (reasoning and behaviour) that are required to answer the item correctly, the main mathematical and statistical ideas the item addresses, and a characterisation of the level of cognitive processing the item calls for. The results are reported using benchmarks which place students' scores into proficiency bands which indicate the extent to which curricula should be responsive to their level of preparedness. We discuss the extent to which the NBTP QL test is succeeding in contributing to meeting the goals of the NBT project. The test is intended to provide institutions with information that will assist with admissions and placement decisions, but the QL test scores are not used uniformly for these purposes across the higher education sector. The NBTP QL test results show that the majority of students are severely underprepared for the QL demands of higher education and that a comprehensive systemic response requiring curriculum change at many levels is required.

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by the 20th of each month

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