# Diagnostic Testing of 1<sup>st</sup> year Students at a University of Technology

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# Outline

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- Currently has just over 10 000 students;
- 3 Faculties: Engineering, Natural Sciences and Management Sciences;
- Mainly teaching institution;
- Predominantly undergraduate programmes such as National Diplomas and BTech programmes in the above fields;













#### The South African Higher Education Landscape

- In 2005, Department of Education reported that of the 120 000 students who enrolled in higher education in 2000, 36 000 (30%) dropped out in their first year.
- A further 24 000 (20%) dropped out during their second and third year.
- Of the remaining 60 000, 22% graduated within the specified threeyear duration for a generic Bachelor's degree.
- This dropout cost the National Treasury R4.5 billion in grants and subsidies to higher education institutions without a return on investment.

# **Total Dropout and Graduation %**



#### 2000 - 2008 First Time Entering Undergraduate Cohort Studies, 2016

### MUT Graduation Rate, (HEMIS)



# MUT Cumulative Dropouts (%), (HEMIS)



■ 2011 ■ 2012 ■ 2013

# **MUT Context**

Service and support aimed at increasing students success:

- Teaching and Learning Development Centre;
- Student Development Department (Counselling);
- Cooperative Education Department WIL;
- Library Services;
- Peer-Mentorship Programme;
- Extended Orientation Programme;
- First Year Experience Programme;
- Lecturing staff;
- Tutorials.

# TALL Diagnostic Tool @MUT

- Test of Academic Literacy and Language (TALL) is a standardised Tests of Academic Literacy;
- The test is meant to measure the academic literacy levels of the entering 1<sup>ST</sup>-year students;
- Administered within 2-3 weeks of registration;
- The test comprises of English and Mathematics MCQs assessing seven domains;
- Currently a couple of other institutions are using it;
- Provide additional information about performance in core, underlying areas (additional to NSC information).

### **Use of Test Results @MUT**

Purpose of diagnostic testing is to provide information that is useful in planning more effective instructions.

Therefore results will assist:

- To identify pre-university knowledge gaps;
- To inform lecturers and support services;
- To inform students of their strengths and weaknesses;
- As the early warning system;
- Inform curriculum change and;
- Improve the teaching style and support interventions.

# Other Diagnostic / Placement Tests

- National Bench Test Project;
- Standardised Assessment Test for Access and Placement;
- Placement Test in English for Educational Purposes;
- Mathematics Achievement Test;
- Scientific Reasoning Test;
- Quantitative Literacy Test;
- Academic Literacy Test of Academic Potential, etc....

# Research questions

- 1. Is TALL a good diagnostic and prediction tool (for our purposes)?
- 2. How does TALL results correlate with the Grade 12 and first semester university results?



- 1. Students write TALL tests in first two weeks of the semester;
- 2. Students write University end of semester assessments;
- 3. Comparative statistical analysis between TALL, NSC and first semester results.

# **Preliminary Results**

# **Participation Summary**

2015, *n* = 1240

2014, *n* = 349

Domains assessed:

Scrambled text

2016, *n* = 2133

- Test type
- Academic vocabulary
- Text comprehension
- Grammar & text relations
- Mathematical Concepts
- Interpreting graphs & visual information

### **Student Performance per Domain**



# **Text Comprehension**



# **Mathematical Concepts**



### **Interpreting Graphs and Visual Information**



# **Reliability and Validity**



#### **Overall Student's Performance**



■ 0-30% ■ 31-40% ■ 41-55% ■ 56-100%

### Levels of Competence, NSC Results



# **Lessons Learned and Conclusion**

- Discrepancies between the Grade 12 marks and marks on the test;
- Students performed better in procedural domain than higher thinking domain;
- Articulation gaps identified;
- Student performed poorly in Mathematics;
- Lack of conceptual understanding of fundamental concepts assumed as pre-knowledge for tertiary education.
- Early identification of students is vital;
- The test instrument described can be used for diagnostic purposes.

# Next steps - Wayforward

- Review and monitor impact of our interventions;
- Finalise the correlation of TALL, NSC with end of semester results;
- Keep searching.

# THANK YOU

