



DMISRS M&E Report 2020

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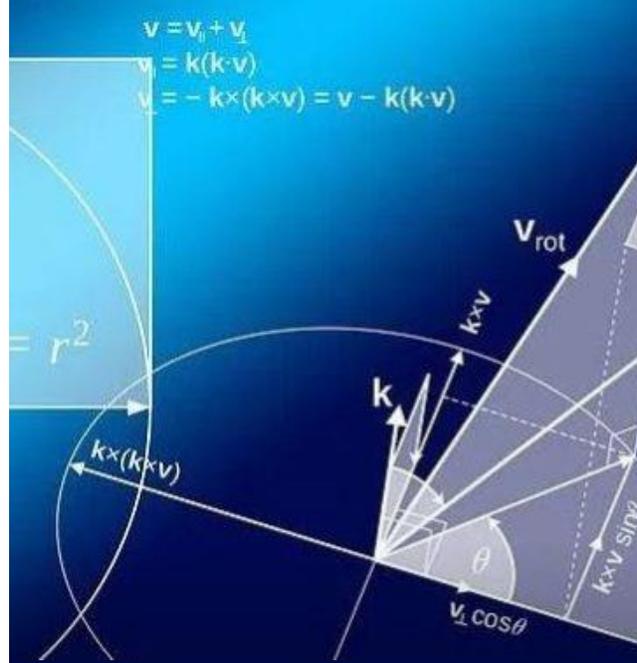


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Introduction

This report summarises the project activities, outputs and participant outcomes of the 2020 Diagnostic Mathematics Information for Student Retention and Success (DMISRS) Project. Intended project activities (surveys, mid-year symposium and data sharing workshops) were conducted as intended, and were recorded and reported on as per the project's Monitoring and Evaluation (M&E) plan. Project partners from participating Higher Education Institutions (HEIs) consistently provided positive feedback on the project's activities, and made suggestions that have been reflected on by the DMISRS team and incorporated into future planning.

What follows is an introduction to the project and a presentation of key DMISRS activities, as well as the associated outputs and participant outcomes per activity.

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

The DMISRS Project was developed to address the lack of alignment between students' literacy practices and mathematical proficiency, and the academic practices of their chosen disciplines. This gap results in significant attrition, which continues to widen inequality, and impacts the economy and future development (about 40% of all registered students have dropped out of their studies by the end of regulation time, and only 27% obtain their degrees in the regulation time [CHE, 2013]). The project proposal sought to contribute towards the national imperative to address the problem of high failure and drop-out rates, in STEM programmes, specifically in first year Mathematics courses.

The DMISRS Project focuses specifically on support for students' mathematical needs in higher education and in STEM programmes in particular, given the national imperative. The project aims to analyse the NBT Mathematics scores and Higher Education Management Information System (HEMIS) data sets in order to establish how students' performance in the NBTs correlate with graduation and drop-out rates. It also aims to research the effect of curriculum-integrated support initiatives for Mathematics in the first year of study and initiate the development of blended learning resources aligned with this research. The ability to achieve these aims hinged on the expansion of National Benchmark Tests Project (NBTP) Mathematics (MAT) testing to facilitate the inclusion of an expanded range of South African

Universities who would not typically have NBTP MAT data for their registered cohorts, and hence optimise and expand the data available.

Broadly, the project involves the following:

1. Individual areas of need for students in identified institutions are determined through sub-domain analysis of NBT Mathematics results in Year 1;
2. Determining the support for Mathematics that has been available in the past (for example, a hot seat, or tutorial classes) in an at-risk Mathematics course in identified institutions are determined;
3. The inclusion of additional support (for example open educational resource material or other online topic-specific resources mediated by a blended learning specialist) based on what seems to have worked at other institutions will be considered;
4. At the end of Year 1, the results will be scrutinised to determine whether they are better than /same as /worse than before (even though this will be a new student group it should be indicative of the impact of the initiative).

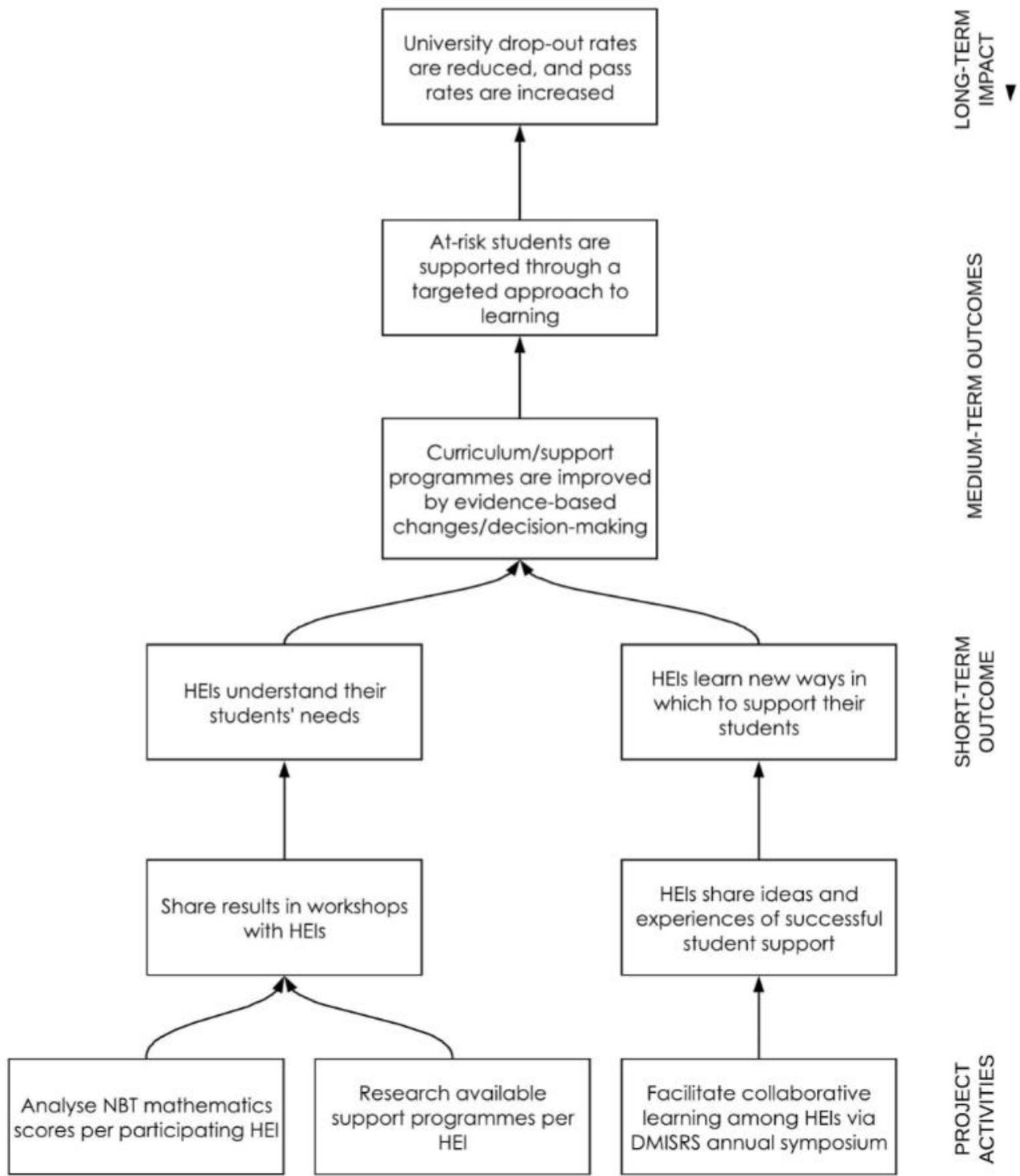
Project Outcomes

The project's outcomes are best served by a Theory of Change that describes the sequence in which these outcomes are expected to be achieved. A Theory of Change further helps to ensure project activities are aligned with the goals of the project, and guides the outputs and participant outcomes that should be measured and monitored. A Theory of Change for the DMISRS project was developed by external consultants in collaboration with the DMISRS team in February, 2019. It is visualized on the following page, and described below.

The Theory of Change begins with the project's primary activities: (1) analyse first-year students' NBT mathematics scores at each of the participating HEIs in relation to their first-year performance, and institutional drop-out and graduation rates; and (2) investigate what curriculum-integrated support programmes are available to these students at each HEI, and what are best practices in this regard. The results of these two investigations are then shared with participating HEIs at annual Teaching and Learning workshops.

As a result of these activities, and direct participation in the annual workshops, HEIs develop an understanding of their students' performance and, consequently, the gaps in their support programmes that fail to address these needs. Using this knowledge, HEIs improve their current student support programmes by using the evidence presented to them in the workshops.

At-risk students are thus better supported by their faculties' revised targeted approach to learning, and, as a result, it is expected that drop-out rates will decrease, and pass/graduation rates will increase.



DMISRS Project Activities

HEI Support Programmes

In October 2020, the DMISRS Project Team administered a survey to HEI partners. Sixteen respondents completed the survey, from 13 institutions across South Africa. The survey was designed to understand how HEIs currently use the NBTs and what support programmes were being implemented among students at that time. The survey data was analysed and reported on by the M&E team, and the full report was shared with HEI partners at the 2020 DMISRS Symposium (discussed below).

The report can be summarised as follows:

- The majority of universities (88%) do not use the NBT results for student placement, or to identify support needs (75%).
- The implementation of student support interventions differ per HEI according to the respondents. This is summarised below:

Type of Support	Percentage of Respondents
<i>Special sessions</i>	19%
<i>Tutorials</i>	100%
<i>Additional materials</i>	63%
<i>Peer Support</i>	44%
<i>Hot Seats</i>	25%
<i>Lecturer Support</i>	68%
<i>Alternative support (extended programme; bridging programme; exam re-writes; course repeats; student tracking)</i>	63%

- 75% of respondents reported that their student support services could be improved.
- 69% of respondents said that they need support in order to change their student support services.

The results of this survey demonstrated that the gap the DMISRS project was established to address is real, reinforcing the relevance of the project for improving institutional support services.

DMISRS Symposium

The 2020 DMISRS symposium was held online on 3 November 2020. The symposium consisted of ten presentations and two panel discussions centred around the theme for the year: *first year mathematics solutions: the use of assessments, performance, blended learning and curriculum development in the time of covid-19*.

Themes that emerged across presentations and discussions include:

- The COVID-19 pandemic highlighted stark socioeconomic disparities between students from disadvantaged and advantaged backgrounds, of which tertiary educators need to be aware when transitioning to teaching and learning online;
- The incoming student cohort for 2021 is likely to be lacking in many conceptual areas that were less-suited to online learning, or were rushed as a result of disrupted learning time;
- As a result of this, it is critically important to understand student profiles using diagnostic assessments, so that curricula and support interventions can be tailored to this unprecedented student cohort;
- A multi-modal approach is best for online delivery, and there are a number of tools and strategies to assist with the implementation thereof;
- Online assessments have proved to be challenging across universities;
- Despite the many challenges that the pandemic has caused, there are a number of positives, such as an embrace of blending learning and increased independence and agency among students;

All presentations and discussions were summarised by the project's M&E team and compiled into a report (available upon request).

At the end of the symposium, participants were asked to complete a short feedback survey. The purpose of the survey was to gauge partners' perceptions of the usefulness of the symposium, whether they intended to apply what they had learned, and how to improve future symposia. Unfortunately, the response rate was low, with only thirteen attendees opting to complete and send back the online survey.

The surveys were analysed and written up into a report by the M&E team. Key takeaways include:

- Regarding the effectiveness of the novel online format, the majority of survey respondents rated it as *very good* (69%) or *excellent* (15%).
- All but two participants said that they found a discussion/presentation particularly interesting or useful.
- The majority of participants (80%) reported that they intend to incorporate what they had learned at the symposium into their future planning.
- Overall, the symposium appeared to be well-received and a valuable offering from the CETAP team. Some respondents closed off the survey by thanking the team for a “*top class*” and “*productive*” symposium.

DMISRS Performance Data Webinar

The DMISRS Performance Data webinar was held online on 22 October 2020 and facilitated by the CETAP team. The purpose of the webinar was to think about and discuss student performance in higher education, and how data relates to this performance. Of importance is how data is used constructively to create new knowledge that can then be used to inform decision-making around teaching and learning. This gathering of information is especially critical as we continue to face new and emerging challenges in teaching and learning, such as navigating the COVID-19 pandemic.

The webinar consisted of three presentations by CETAP staff. These presentations covered the following topics:

- Methodology and data requirements to undertake data-informed performance work;
- Presentation of case studies using performance data within higher education institutions; and
- Ongoing work being done with DMISRS partner institutions.

The webinar was attended by a total of 34 people from multiple universities. Attendees were asked to provide feedback at the closure of the webinar, but unfortunately only six attendees chose to do so. All six respondents found a particular presentation interesting or useful; half noted that the presentation on ongoing work with partner institutions to be the most interesting/useful. The majority of respondents (83%) said that they feel as though they have a better understanding of how they would go about determining their students' needs, as well as supporting these needs. Closing comments were positive, thanking the facilitators for an interesting discussion and for fostering a feeling of community.

Diagnostic Assessments Webinar

On 24 November 2020, members of the CETAP team conducted an online webinar on diagnostic assessments, and the use of diagnostic data for wrap-around student support and curriculum development. A total of 101 people, from 24 universities, signed up to attend the webinar.

These topics have been deemed particularly important by the CETAP team due to the following reasons:

- South African enrolment in tertiary education is low compared to other countries with similar GDPs;
- National throughput rates are low for undergraduate degrees;
- National dropout rates are high for undergraduate degrees; and
- The COVID-19 pandemic has caused major disruption to education, necessitating the need for additional interventions over the next few years to support those whose academic performance suffered during the pandemic period.

In line with this context, the webinar covered the following topics, followed by a question-and-answer session at the end:

- Diagnostic Assessments as an approach to understanding student needs and developing student-centred solutions;
- The NBTs as diagnostic assessments;
- Scenario of using NBT diagnostics to inform wrap-around support; and
- An assessment-led approach to curriculum development.

Pre-Webinar Survey

Prior to the webinar, the CETAP team prepared a survey that was distributed among the webinar's attendees. This was to understand the effects of COVID-19 on teaching and learning that the attendees are currently facing at their institutions, as well as the impact that they expect these effects will have on incoming cohorts. The survey also intended to uncover attendees' prior experiences of diagnostic assessments, and what they hope to get out of the webinar.

Key takeaways from this survey include:

- Respondents noted a number of concerns regarding the incoming student cohort, such as knowledge gaps, unequal access to education resources, and an increased need for academic support;
- Respondents also noted some positives to come out of the 2020 year, including an increased sense of independence, confidence and resilience among students;
- A quarter of the attendees said that their institutions have not used diagnostic assessments at all before, whereas half of the attendees said that they have used them for diagnostic purposes before.

Post-Webinar Survey

At the end of the webinar, attendees were asked to complete a short survey detailing their experience of the webinar. Sixteen attendees opted to complete and send back the online survey.

All but one respondent finding a discussion/presentation particularly interesting or useful. A quarter of respondents reported they were particularly interested in the usefulness of using diagnostic assessment to inform curriculum development. Another quarter specifically mentioned the analysis of NBT sub-domains and its usefulness in providing more tailored, student support. Almost all (94%) of the respondents reported that they intend to apply what they felt was their biggest takeaway to their future planning, such as developing diagnostic measures and tools to use in formative assessments and curriculum development.

Going Forward

Monitoring and evaluation of the DMISRS project and associated activities will continue in 2021. This includes: conducting HEI partner surveys; reporting on Teaching and Learning Workshops/webinars; reporting on the DMISRS Symposium; and compiling an annual M&E report.

Conclusion

Despite significant disruptions due to COVID-19 and the national lockdown, the DMISRS project was able to implement three of its activities. The team successfully managed to adapt to an online environment, facilitating the webinars and symposium without any issues. These activities were recorded and reported on by the M&E team (full reports are available upon request). Participant feedback was consistently positive, indicating a sustained interest in the topics covered. Useful suggestions were also made by the participants, which have been carefully considered by the DMISRS team for future events and offerings.

It is worth noting a considerable decline in participant feedback this year. Survey responses were low across all DMISRS activities. This is likely due to 'online fatigue' as participants worked hard to quickly adapt to a new normal, shift to online teaching platforms, and ensure students were not left behind due to the pandemic and lockdown. Should this continue in 2021, surveys will be conducted telephonically as needed.