

Curricula failing students, says study

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NSC has lowered the standard of school maths

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- National Advisory Council on Innovation -- which advises the Cabinet**

The new school maths and science curricula, examined in matric for the first time in 2008, are an even worse preparation for university than preceding versions, preliminary findings suggest.

In mid-year university exams last year students in science-based, first-year programmes performed significantly worse than their predecessors. The 2009 first-year students were the first cohort produced by the new school curriculum.

The country's production of doctors, pharmacists, engineers and scientists could be in peril, warns "Critical Issues in School Mathematics and Science: Pathways to Progress", published by the Academy of Science of South Africa (Assaf) this week. The study emanated from a forum held at the University of Pretoria a year ago.

Edited by University of Pretoria physics professor Diane Grayson, the study's 10 chapters examine the effects of the new national senior certificate (NSC) on university students' performance. It also considers related factors such as the quality of science and maths teaching in multilingual classrooms.

The NSC did away with higher and standard-grade papers in all subjects, introduced "maths literacy" as an alternative to maths and made one of the two compulsory, along with two languages, for all grade 10, 11 and 12 learners.

"Early indications are that overall student performance in science-based programmes at higher-education institutions is below that of previous years," the study says. "Anecdotal evidence" from universities suggests that students' "problem-solving skills and conceptual understanding" are worse than they were in the past.

"The decline in performance of science students will severely limit the creation of a future pool of potential scientists, engineers and health practitioners, as well as future teachers of mathematics and science," the study warns. The notorious gap between schooling and higher education has widened: 2009's first-year engineering students were among those who struggled, and some universities reported a 50% decrease in passes, the study says.

Earlier this year the National Advisory Council on Innovation -- which advises the Cabinet -- said, in effect, that the NSC had lowered the standard of school maths: "A pass of between 60% and 70% in the new curriculum in 2009 was approximately equal to a 50% pass at higher grade level before 2008."

South Africa needs a "curriculum institute", the Assaf study suggests. The lack of such an institute has meant that "for more than a decade, there have been curriculum revisions and re-revisions, involving various levels of consultation. Poor articulation between curriculum developers and teachers has led to discrepancies between intended and implemented curricula".

Coincidentally, Monday was the last day for public comment on the latest curriculum revisions posted recently on the basic education department [website](#).

The Assaf study also queries exam standards. Civil engineering professor Elsabe Kearsley says maths assessments do not require much in the way of problem-solving skills and learners can earn a distinction just by memorising the work.

"The fact that candidates write examinations equipped with calculators, as well as formula sheets, makes it difficult to establish the actual level of students' understanding of the topics covered in the curriculum," she writes.

With the 2010 matric exams starting next week, the study diagnoses assessment problems in the NSC.

"At present, examinations are set primarily by individuals from the schooling sector and moderated by a small number of university lecturers per subject. Too much responsibility lies in the hands of a few individuals in each subject area."

The study suggests that a "semi-autonomous structure" take responsibility for exams.