# *Project Sediba:* a programme for upgrading physical science and mathematics teachers in Southern Africa

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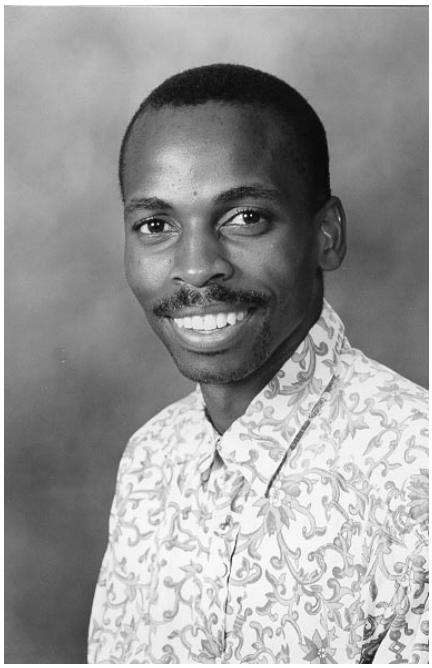
The beginning of 1996 witnessed the establishment of an upgrading programme for physical science and mathematics teachers, called the SEDIBA Project. The SEDIBA (Setswana word for fountain) Project is a partnership involving the Potchefstroom University for CHE, the North West Education Department, and NASCHEM—a division of DENEL, a giant armaments corporation. The project is aimed at improving the quality of science and mathematics teaching by assisting science and mathematics teachers to gain mastery of the subject and to teach it with confidence and commitment. The teaching of these subjects is of fundamental importance in the establishment of high technology industries and wealth creation in the Republic of South Africa. Amidst the recurrent high failure rate amongst matriculation science pupils and reports that local standards in education, particularly that of mathematics and science, are far below the norm, the founding of the SEDIBA Project was a much needed development.

Upon its inception in 1996, the SEDIBA Project registered an initial group of 40 teachers in the physical science stream. In the beginning of 1997, not only did 45 new teachers enrol for the first year of the physical science course, but a new programme for upgrading mathematics teachers was introduced with an initial enrolment of 37. The total enrolment of teachers in both



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physical science and mathematics programs to date is 117.

Project SEDIBA comprises two professional development programmes for physical science teachers and mathematics teachers offered on part-time bases. Tuition is done by means of contact teaching involving state of the art computer aided instruction and by means of distance learning. Lectures are offered mostly during school holidays on the campus of the Potchefstroorn University. Courses are presented at an equivalent of first year university level. The physical science stream consists of physics, chemistry, education, didactics of physical science, and computer literacy. Practical work forms an integral part of the physical science programme. The mathematics stream consists of topics in algebra, Euclidean geometry, trigonometry, calculus, education, computer literacy and didactics of mathematics.

Hosted by three academic departments (physics, chemistry and mathematics), project SEDIBA functions under the directorship of Professor Pieter Steyn, who is the head of the Chemistry Department and a member of the Executive Committee of the IUPAC Bureau. Four other senior members from the three above-mentioned departments are also involved in the day-to-day running of the project. As part of its contribution, the North West Education Department seconded two senior science teachers, Mr Wesi and Mr Dolo to the project; both are registered for masters degrees in science education. The management and staff of the SEDIBA Project are pleased that both the planning and organization of the project have been successfully executed. Both the teachers and the lecturing staff are highly motivated and enthusiastic about the project.

The current target of SEDIBA Project is practising secondary school teachers in possession of a 3-year diploma in physical science or mathematics teaching in the North West Province. The financial support from NASCHEM, as part of its social responsibility programme, makes it possible for teachers to enrol for this programme at reduced tariffs. Upon completion of the programme, teachers will obtain a higher education diploma in science or mathematics education. SEDIBA staff members are actively involved in research; investigating numerous aspects of science education such as the situation analysis with regard to the qualification and distribution of science teachers in the North West Province, the use of computer aided instruction, alternative conceptions, and the conceptualization of concepts in both science and mathematics.

Since its inception, the SEDIBA Project is steadily making a difference in the lives of teachers who for a long time tried to teach, however, with little success, and children who emerge from an educational environment characterized by crises, high failure rates, and a lack of a culture of learning. Through 117 teachers, the

SEDIBA Project is reaching out to over 30 000 pupils. Feedback from subject advisors and schools indicates that there has been a marked improvement in the quality of teaching from the SEDIBA teachers. The success of the project is attributed not only to commitment and dedication by both the teachers and the lecturing staff, but also to the fine spirit of cooperation between all the parties involved (that is, NASCHEM, the North West Education Department and the Potchefstroom University). It is envisaged that project SEDIBA will continue to make a considerable impact on the educational system, elevating the levels of science and mathematics education. This will enable more young people, particularly those from previously disadvantaged communities, to qualify for careers as scientists, mathematicians and engineers. The project will be extended to the Mpumalanga Province in 1998. Fifty physical science and mathematics teachers will be involved in a teacher upgrading programme made possible by a generous grant from INGWE, a coal mining company belonging to Gencor.