

SOUTH AFRICA

Transformation of classroom practice through the use of ICT and child-centred teaching and learning

Introduction

The poor quality of teaching and learning of Mathematics and Science in South African schools has been the source of serious concern for some time amongst stakeholders with an interest in the education of children. Poor performances in standardised assessments (national matriculation examination at grade 12 level and Annual National Assessments at grades 3, 6 and 9) point to fundamental problems in the teaching and learning of Mathematics and Science subjects, particularly in the country's rural and township schools. Low confidence levels of teachers in their own content knowledge (of the subjects), inappropriate teaching skills of teachers, and poor access to quality educational resources that stimulate young minds have been identified as key contributory factors that hinder learner achievement in the critical subjects. In addition, the majority of learners within the public school system come from impoverished socio-economic backgrounds that present additional barriers to their learning and development. Learners with disabilities and those experiencing learning difficulties are also often marginalised and denied the right to basic education.

The national Ministry of Education (Department of Basic Education or DBE) recognises that in order to achieve quality education, all these challenges require attention. Hence, the need to address learning difficulties, to respond to socio-economic and health barriers, to provide quality education on a mass scale, and to ensure that education provision meets the demands of a highly technological global environment provide the driving force behind the search for innovative solutions with the aim of transforming teaching and learning.

In South Africa, an excellent opportunity for innovation has been identified. The ICT in Education (ICT-Ed) project, to be implemented in 200 schools in KwaZulu-Natal in the next few months, aims to address the poor quality of teaching and learning in the classroom by replacing traditional teacher-centred teaching with a learner-centred technology-based teaching and learning programme. Several of these schools will also receive a school-strengthening programme that addresses barriers to learning and development. This is an opportunity to bring under the microscope an innovative approach which combines the care and support necessary to reduce intrinsic and socio-economic (including societal) barriers with ICT that has great potential, if used effectively, to address pedagogical barriers experienced by learners. With the focus on learner participation and learners taking much responsibility for their learning, ICT provides an

opportunity for teachers to design learning activities for learners of differing abilities and learning styles, while at the same time providing access to learning materials that can bring to life concepts that the traditional teacher-centred “chalk and talk” approach cannot do.

1. Aims

An innovative action research intervention will be implemented in five schools in the Umlazi District whereby

- schools will be strengthened to identify and address barriers to learning through the establishment of support structures at school, circuit and district levels, and by building capacity of teachers and the system to make the curriculum accessible to all learners;
- schools will be resourced with appropriate technology, and learners and teachers provided with laptops and tablets that will enable interactive teaching and learning to take place;
- teachers will be trained to use the technology to deliver the curriculum in innovative and interesting ways that encourage greater participation of learners;
- Subject teacher forums making up communities of practice will be established and programmes of activities to support on-going professional development of teachers implemented, leading to improved teaching skills and subject content knowledge (using the education centre as a node).

The traditional classroom will be transformed into an environment where teachers take on the role of managers of learning and learners are directed in their learning to use resources made available to them in digital format. Learners will explore concepts and solve problems using technology, and in doing so spend more time in engaging with the learning materials rather than passively listening to a teacher “lecturing” to them.

The project aim: To combine the use of ICT with care and support to transform teaching and learning.

The project objectives:

- To strengthen schools to screen and identify children experiencing barriers to learning and to take steps to reduce the impact of these on the children’s performance;
- To establish cost effective and context appropriate technology infrastructure to support teaching and learning at the education centres and the project schools;
- To develop the capacity of teachers through training in the use of technology as a vehicle to plan and deliver learner-centred lessons;
- To establish professional learning committees of teachers of Mathematics, Science and Languages as the first step in the implementation of a Department-led Teacher Development Programme;
- To build the capacity of parents/caregivers to support their children’s learning;
- To provide guidelines for mass replication;

The ultimate goal is to change the traditional lecture mode of lesson delivery to one where learners participate more actively and take greater responsibility for their own learning. Within the context of the traditional teaching approach in South Africa, this demands a revolutionary change of roles for both learners and teachers, with a major shift in power relations. This requires teachers to be prepared to acknowledge that they “don’t know it all” and learners to realise that they can be “explorers”, setting out to learn by “doing” (active participation). Learning together and sharing knowledge with their peers also open up different ways of acquiring knowledge and skills, while at the same time providing opportunities to develop social skills and team work. A greater responsibility is placed on the teacher to plan carefully and effectively in advance, to “script” lessons that cater for different learning levels and styles.

The ICT-Ed project also provides for the lessening of the administrative burden of teachers and other school staff by putting in place a system that has the ability to monitor learner attendance and progress. The technological facility has the ability to generate reports and send instant messages to parents and caregivers in the event of their children being absent. In bringing together ICT-Ed and care and support, the two systems work effectively in support of each other: teachers trained in screening and identification of learning barriers are able to input this information into the learner database at school level. Such information can be relayed speedily to a network of support organisations / agencies / government departments, making referrals of cases faster and easier to track. In the same way, learners with specific learning difficulties (e.g. in reading) can be attended to by the teacher whose time may have become available when learners are working on individual or group tasks on their tablets.

The learners targeted:

All children from the five selected schools (Umlazi District) as detailed below.

No	Name of school	School enrolment		Circuit & Ward	Location (urban / rural etc)
		Boys	Girls		
1	Khuthala Primary	230	220	Umbumbulu, Maphundu	Peri-urban
2	Embokodweni Combined Primary	539	550	Phumelela, Dukumbane	Peri-urban
3	Isiphingo Higher Primary	600	580	Phumelela, Isipingo	Peri-urban
4	Kusakusa Primary	514	432	Umbumbulu, Mafa	Peri-urban
5	Muzomuhle Primary	435	389	Umlazi, Isipingo	Peri-urban

The schools are located within the peri-urban areas of the Ethekwini metropolitan area in the former black township of Umlazi. Township schools are characterised by large school learner populations and overcrowded classrooms. The populations from which the learners come are largely semi-skilled or unskilled. Education levels of parents and caregivers range from low-literate (majority) to a small percentage of diploma level graduates. High youth unemployment and many single parent families are common.

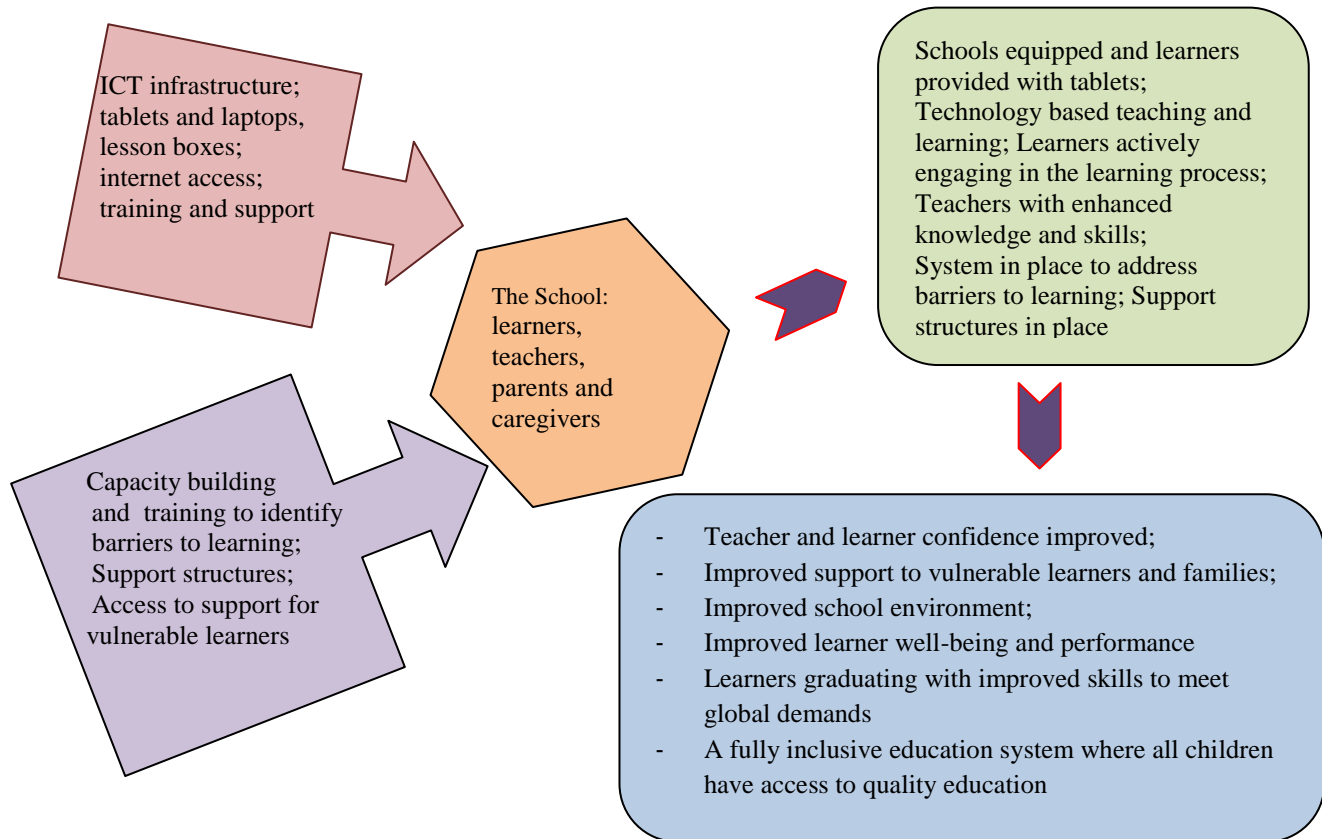
2. Leadership and Partners

The project, led by the provincial Department of Education, KwaZulu-Natal (KZN DoE), will fall under the care of Senior General Manager, Curriculum Management and Delivery. At the national level, the DBE will be an “interested partner”, with the responsibility of scaling up successful education innovations to other provinces. At school level the school management team headed by the school’s principal will own the project. For the purpose of the project, the school management team will include representation from the school governing body (parent component) and from the representative council of learners (RCLs).

MIET Africa will be the lead implementing partner of the Department, with the crucial role of ensuring that teachers, school management, parents and caregivers, and community members are brought on board as key stakeholders and partners through orientation and training. The organisation will also be the coordinator for the ILE project. Other partners supporting the project include ReMagine, responsible for resource mobilisation and installation of the ICT infrastructure; the Umoya Technology group, responsible for the installation of digital learning materials and connectivity; and Tshikululu Social Investments, responsible for resourcing the care and support activities, and participating in the action research.

3. Strategies and activities

The project, to be implemented as a learning laboratory, is a combination of two interventions, both designed to address barriers to learning. The ICT-Ed strand addresses the needs of learners experiencing pedagogical barriers and is directly linked to the outcome of improved learner performance. The care and support strand strengthens schools to address other barriers (socio-economic, psycho-social and intrinsic barriers) experienced by learners and which impact on their ability to devote attention to their studies.



Activities

A summary of the activities for each strand is provided below:

ICT in Education:

- Installation of cabling and networking in each classroom;
- Installation and supply of ICT equipment at each school: a laptop and a tablet for each teacher and a tablet for each learner;
- Installation of a “lesson box” in each classroom (the lesson box is an accessible electronic storage device loaded with relevant teaching and learner support materials that allows learners and teachers to access the materials through wi-fi connectivity);
- Training and support to teachers on how to plan lessons and use technology to design learner-centred learning activities;
- Establishing professional learning communities of practice: teachers of Mathematics, Science and Languages will be encouraged to meet regularly in their subject groups at a nodal centre (education centre or school) to share lesson plans, teaching experiences and best practice.

Addressing barriers to learning and development

- Training and capacity building of teachers at each school to implement the screening, identification, assessment and support process in their classes so that learners experiencing barriers to learning can be detected and appropriately supported;
- Establishment of support structures at each school to assist learners identified as needing support;
- Establishment of a multi-sectoral network of support agencies and service providers that operate in the areas where schools are located that can provide the necessary support to identified children when such support is requested by the school or education authorities;
- Facilitating support for needy learners and their families through the convening of multi-sectoral service delivery days in collaboration with provincial and local government-driven initiatives.

4. Context

The province of KwaZulu-Natal is the most populous province in South Africa. It also has one of the highest rural populations in the country, with the majority living in poor socio-economic conditions characterised by high unemployment rates especially among the youth. As a result, many children attending school suffer some category of vulnerability, and are not able to concentrate in class. Often their attendance is also affected and they don't attend school regularly.

At ground level, although schools are provided with text books, these sometimes arrive late at the school and often there are insufficient numbers of resources to go around. In the classroom, learners at most schools are subjected to the "chalk-and-talk" approach to teaching. Learners are rarely exposed to a variety of media during lesson presentations and have to rely on their teachers' descriptions and interpretations of concepts and events. Abstract concepts in Mathematics and Science remain largely unexplained because of the absence of concrete and visual materials. Learners experience un-stimulating school environments and are given very little opportunities to explore ideas and concepts on their own because of poor access to information and lack of appropriate guidance from teachers who are often un-or under-trained and who also work in resource-constrained environments.

ICT in education

Within the policy environment, South Africa has a well-developed ICT in Education policy (e-Education White Paper of 2004) that articulates the goal of ICT in Education in the country: "Every learner in the primary and secondary sectors should be ICT capable in 2013" (2004:9). The White Paper also emphasises the role of ICT in the promotion of economic growth, job-creation, social development and global competitiveness. Considering that in 2013 the majority of schools still have little or no access to ICT, the goal of e-Education White Paper will clearly not be met. There is therefore an urgent need to use every opportunity to make schools ICT- education compliant, especially in the context of the current generation of children who are growing up in a highly technologically- advanced environment. Unfortunately, it is the teacher and not the availability of ICT in schools that is more often the greatest barrier to progress in terms

of the use of ICT in Education. With many teachers having “grown up” in a system that was (and still is) characterised by the lecture-method textbook-based teaching approach, it is not surprising that many are fearful of and resist transformation. It is critical to get teachers on board through training and support.

The motivation to give urgent attention to the wider scope of barriers faced by children is contained in the noted policy document Education White Paper 6 (Inclusive Education), the goal of which is to transform all educational institutions into institutions of learning, care and support. This policy document was drafted against the backdrop of the inequalities within education provision resulting from the imposition of decades of apartheid education on the people of South Africa, a system that was deliberately designed to exclude the majority of children, youth and adults from receiving a quality education.

5. Resources

The Department of Education is the key provider of resources, aligned with its responsibility as the duty-bearer. Basic school infrastructure, furniture, teaching staff and school facilities are provided by government.

The Care and Support strand and action research component of the project will be supported by a corporate funder, providing basic funding to support schools in establishing systems and structures to screen, identify, assess and support children with barriers to learning.

For the ICT strand, funding has been sourced by Remagine, an NGO acting as the resource mobilisation agency to support the installation of ICT, preparation of schools, training of teachers, provision of laptops and tablets, and networking and connectivity.