Changing Teaching, Changing Times

Lessons from a South African Township Science Classroom
**Scope**

*Bold Visions in Educational Research* is international in scope and includes books from two areas: *teaching and learning to teach* and *research methods in education*. Each area contains multi-authored handbooks of approximately 200,000 words and monographs (authored and edited collections) of approximately 130,000 words. All books are scholarly, written to engage specified readers and catalyze changes in policies and practices.

Defining characteristics of books in the series are their explicit uses of theory and associated methodologies to address important problems. We invite books from across a theoretical and methodological spectrum from scholars employing quantitative, statistical, experimental, ethnographic, semiotic, hermeneutic, historical, ethnomethodological, phenomenological, case studies, action, cultural studies, content analysis, rhetorical, deconstructive, critical, literary, aesthetic and other research methods.

Books on *teaching and learning to teach* focus on any of the curriculum areas (e.g., literacy, science, mathematics, social science), in and out of school settings, and points along the age continuum (pre K to adult). The purpose of books on *research methods in education* is not to present generalized and abstract procedures but to show how research is undertaken, highlighting the particulars that pertain to a study. Each book brings to the foreground those details that must be considered at every step on the way to doing a good study. The goal is not to show how generalizable methods are but to present rich descriptions to show how research is enacted. The books focus on methodology, within a context of substantive results so that methods, theory, and the processes leading to empirical analyses and outcomes are juxtaposed. In this way method is not reified, but is explored within well-described contexts and the emergent research outcomes. Three illustrative examples of books are those that allow proponents of particular perspectives to interact and debate, comprehensive handbooks where leading scholars explore particular genres of inquiry in detail, and introductory texts to particular educational research methods/issues of interest to novice researchers.
Changing Teaching, Changing Times
Lessons from a South African Township Science Classroom

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A special word of thanks goes to our respective families, without whose love, support and encouragement none of this would have been possible or, really, have made any sense at all.

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## EXPLANATION OF TERMS

### ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANC</td>
<td>African National Congress</td>
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<tr>
<td>C2005</td>
<td>South African Curriculum Reform Programme</td>
</tr>
<tr>
<td>CEPD</td>
<td>Centre for Education Policy Development</td>
</tr>
<tr>
<td>COSAS</td>
<td>Congress of South African Students</td>
</tr>
<tr>
<td>COSATU</td>
<td>Congress of South African Trade Unions</td>
</tr>
<tr>
<td>DET</td>
<td>Department of Education and Training</td>
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<tr>
<td>HOD</td>
<td>Head of Department</td>
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<tr>
<td>INSET</td>
<td>In-service education and training</td>
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<td>JMB</td>
<td>Joint Matriculation Board</td>
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<tr>
<td>NSC</td>
<td>National Senior Certificate</td>
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<tr>
<td>NECC</td>
<td>National Education Crisis Committee</td>
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<tr>
<td>NEPI</td>
<td>National Education Policy Initiative</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
</tr>
<tr>
<td>OBE</td>
<td>Outcomes-based education</td>
</tr>
<tr>
<td>PASO</td>
<td>Pan Africanist Student Organisation</td>
</tr>
<tr>
<td>PRESET</td>
<td>Pre-service education and training</td>
</tr>
<tr>
<td>PTD</td>
<td>Primary teacher’s diploma</td>
</tr>
<tr>
<td>PTSA</td>
<td>Parent-Teacher-Student Association (pronounced “pit-za”)</td>
</tr>
<tr>
<td>SADTU</td>
<td>South African Democratic Teachers Union</td>
</tr>
<tr>
<td>SCISA</td>
<td>Science curriculum initiative in South Africa</td>
</tr>
<tr>
<td>SEP</td>
<td>Science Education Project</td>
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<tr>
<td>SRC</td>
<td>Student Representative Council</td>
</tr>
<tr>
<td>STAP</td>
<td>Science Through Applications Project, a curriculum research and development project</td>
</tr>
<tr>
<td>STD</td>
<td>Senior teacher’s diploma</td>
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<td>UWC</td>
<td>University of the Western Cape</td>
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### COLLOQUIAL WORDS/EXPRESSIONS

- **Bundu(s)**: Wild, open country remote from civilisation
- **Dagga**: Local word for marijuana (pronounced “dha-gha”)
- **Jol**: To play, frolic, have fun
- **Matric**: Grade 12, final year of secondary school
- **Skollie**: A street hoodlum, usually a criminal or potential criminal
EXPLANATION OF TERMS

and member of a gang

*Sjambok*  Originally a stout rhinoceros or hippopotamus hide whip

*Toyi-toyi*  A militant dance expressing defiance and solidarity, especially during political demonstrations

*Tsotsi*  A usually flashily dressed black street thug, frequently a member of a gang (similar to *skollie*)

*Ubuntu*  Human-heartedness (equivalent to Chinese *jin*); quality embodying all the traditional virtues and values of Africa

*Ja*  Commonly used Afrikaans word for “yes”

*“Yho hayi!”*  Xhosa exclamation of amazement or surprise (in English – literally, “Whew, no!”)

TERMINOLOGY

African  A member of one of the black indigenous peoples, as distinct from “coloured”, Indian, white or Khoisan people.

Coloured  South African of racially mixed descent. Regarded by some as a racist term: hence “coloured” and “so-called coloured”.

Students  Youth at school are called, interchangeably, *pupils* and *students*. Now officially referred to as *learners*. African youth at school almost invariably refer to themselves as *students*.

Township  Urban area set aside for black occupation.

White  Usually people of light skin colour and/or European descent.
POINTS OF CLARIFICATION

1. Jonathan Clark and Cedric Linder together crafted the research reported on in this book, but it was Jonathan who spent the many necessary months in Nomzamo’s classrooms.

2. The terms *African*, *Coloured* and *White* are used in this book. Seeing as these groupings underpinned the political system of racial classification that characterised apartheid, these divisions have been invested with considerable (often emotive) meaning in South Africa. Our use of these terms is in no way an attempt to legitimize these categories, nor a denial of the complexity of social constructions such as race, ethnicity and culture. However, in common with the majority of South Africans, we continue to use these terms in a non-pejorative way in our everyday speech. Similarly, the term *black* also appears in the text – sometimes (quite intentionally) it is used as a collective term to describe all people who were discriminated against under the apartheid system. On other occasions, it is used synonymously with the term *African*. In general though, Nomzamo and her students at Yengeni High are referred to as African, and Jonathan, white.

The Xhosa are the second largest ethnic group in South Africa after the Zulus. IsiXhosa is spoken by around 7 million people.

3. Seeing as the majority of South African teachers are women (64%), we have intentionally chosen to use the feminine gender for pronouns which apply to teachers.

4. Nomzamo and Jonathan’s conversations together were always held in English, which is not Nomzamo’s primary language. Extracts from interviews have been included verbatim, and we have not, as a rule, edited either Nomzamo’s or Jonathan’s comments. However, in order to assist the reader to make sense of our dialogue, we have sometimes included a short explanation in [square brackets] in the text. Less frequently, we have taken the liberty to add to the text – by placing an expression in “parentheses”. The same approach was adopted in the transcripts from the student interviews.

5. During the more descriptive accounts, such as the narrative fragments and the extracts from the journal entries, both past and present tense have been used. Each chapter (bar the final one) has a set of endnotes attached to it.
POINTS OF CLARIFICATION

When work which has also been referenced in the main text appears here, then only the author(s) and date of publication are noted. However, if it is not referenced in the main text, then the full citation is given.

6. In South Africa, the different years of schooling are officially referred to as Grades 1–12.

7. All proper names used in this book are pseudonyms, including the names of schools which Nomzamo attended and at which she taught. The one exception is Jonathan, who is usually referred to in the interviews as Jon – the name by which most people (including Nomzamo) tend to call him.

8. Dates are written in the following format: DD/MM i.e. 12/1 means 12th January.
CHAPTER 1

LESSONS FROM THE CONTEXT-BOUND CHALKFACE

1.1. INTRODUCTORY COMMENTS

In this book we are going to explore issues relating to educational change. We will do this by drawing extensively on a case study of a science teacher we have called Nomzamo, who works in a large, over-crowded and under-resourced urban secondary school called Yengeni High, a school typical of those found in African townships throughout South Africa.

The main theme revolves around Nomzamo's experiences of implementing an alternative curriculum programme in her classroom. What happened to her during this process provides a rich basis for exploring some of the complexities of teaching science in an educational setting full of constraint and contradiction.

But this is not only Nomzamo’s story; it also involves the hundreds of students she teaches on a daily basis, her colleagues in the staff room and an institution which still bears the scars of its apartheid past. The story is set against the backdrop of an education system which is itself seeking to implement a programme of the most fundamental reforms.

It is also a story about collaboration, and has things to say about the vital role which a reflective dialogue can play in helping a teacher make sense of the “puzzles of practice” thrown up by her introduction of an innovation in her classroom. Yet more than anything else, it is a story which attests to the power of individual agency, and is intended as a celebration of the actions of an ordinary teacher whose willingness to leave the well-worn path of familiar practice stands as a beacon of possibility in a context which seems to be so often devoid of hope. While it relates the highly personal experiences of a single teacher, we believe this story provides insights into the challenges to practice, and constraints on change, which countless others face in their working lives in schools not only in South Africa, but also across the world.

Finally, while this book is set firmly in the present, it is at the same time a journey into the past, and draws extensively on both Jonathan’s and Nomzamo’s experiences over the years of having taught in township schools. As such, it is a uniquely South African story which seeks to shed fresh light on how the legacy of apartheid education has (and continues to have) a major influence on teaching and learning in this country.

Presented as such, this book may appear to the reader to be somewhat unusual, and relative to the conventions which inform much of the research in science education in South Africa, this is undoubtedly true. Yet there are, we believe, good reasons for breaking with tradition in this way, particularly since we find ourselves at such a critical juncture in our country’s educational history, where
CHAPTER 1

the wholesale reforms sweeping through the system are expected to bring about major shifts in the forms and function of teaching and learning in the classroom.

As reported research over the years has shown, the process of curriculum change entails the most daunting challenges, no more so than at the crucial stage of classroom implementation; and it is here that we believe that as South Africans, we have a serious problem – for in common with other developing countries, there is a dearth of reported research on what actually goes on in and around science classrooms. We would contend that we have so little understanding of the “realities of schooling at the chalkface”, that it hardly seems an exaggeration to propose that we know virtually nothing at all about how individual teachers cope and respond to the challenges of practice, either under existing conditions or when faced with implementing change.

This is a state of affairs which stands in stark contrast to that found in the developed world where, as Hargreaves (1994) reminds us, the literature on teacher learning and change is replete with theories and understandings of what has come to be known as the change process.

Furthermore, and to make matters worse, whereas there is a strong academic tradition of theorising education in South Africa, this has not as yet translated into a tradition of research into curriculum transactions in schools. This is a real problem, seeing as analysts of curriculum change processes have long called for rigorous, in-depth studies of the school milieu. As Dalin (1978, p. 1, cited in Crossley and Vulliamy, 1984) reminds us: “Understanding the culture of the school is essential if we are to identify change strategies which will succeed in the complex task of renewing the educational system”.

1.2. “TO INFINITY AND BEYOND” – SOUTH AFRICA POST-1994, A CURRICULUM IN FLUX

With the coming to power in May 1994 of South Africa’s first democratically elected government, a vigorous effort has been mounted to overhaul the country’s education system. In the decade since then, wholesale reforms have swept through the system, intended to bring about major shifts in the forms and function of teaching and learning in the classroom.

These reforms are centred on an ambitious plan entitled Curriculum 2005 (C2005) that intends to revolutionise schooling in this country through the introduction of an outcomes-based education (OBE) curriculum.

The high rhetoric of national policy documents call for a curriculum that is learner-centred, holistic, unbiased, integrated and relevant, to develop critical citizens who can participate actively and responsibly in a democratic, multicultural society. This is to be achieved by adopting a model of transformational outcomes-based education that “involves the most radical form of an integrated curriculum”.

Teaching and learning, according to the tenets of OBE, will replace the all-too-ubiquitous pedagogical style of rote learning so prevalent under apartheid. A central aim of OBE is to shift from teacher-centred to learner-centred approaches,
LESSONS FROM THE CONTEXT-BOUND CHALKFACE

to foster critical thought and to focus on developing appropriate skills, by drawing on work that is relevant to the students’ lives. Assessment as it is presently conducted will disappear, to be replaced by a system in which students’ achievement of outcomes, at their own pace, will be recognised. In short, it is envisaged that education as we know it in South Africa will never be the same again.

Yet, as experiences over the past few years have shown, OBE is a complex educational model, and critical issues relating to its suitability as a reform movement for South Africa have been raised in a number of published articles with areas of contestation centering around epistemological, political, moral and implementation difficulties.

In a seminal paper on the implementation of an OBE model in South Africa, Jansen (1998) suggests that the current status of education in this country militates against sophisticated curriculum reforms such as OBE. His thesis is that OBE will fail because it is a policy being driven, in the first instance, by political imperatives which have little to do with the realities of classroom life. And that rather than spawn innovation, OBE will in fact undermine the already fragile learning environment in schools and classrooms of the new South Africa.

Besides adding his voice to those who question OBE’s epistemological orientation and raising important political objections, Jansen argues persuasively that OBE will fail because it is based on flawed assumptions about what actually happens inside schools, how classrooms are organised and what kinds of teachers exist within the system. Particularly since over-crowded and under-resourced classrooms are the norm in South Africa, we have an environment which directly militates against the conditions of OBE’s success.

For us, what is perhaps his most cogent point concerns the fact that, for OBE to succeed even in moderate terms, a number of interdependent innovations must strike the new educational system simultaneously. For example, support of OBE’s implementation requires trained and retrained teachers, radically new forms of assessment, parental support and involvement and so on – in other words, an entire re-engineering of the education system.

However, for all that, as events over the previous few years have shown, OBE is likely to remain dominant as a curriculum model for a long time to come. As Le Grange (1999) puts it, languages of critique (as reflected in the academic literature) do very little to transform schools and help teachers cope with change:

Few would disagree that our schools need to be transformed by eradicating legacies of apartheid and replacing them with the qualities of democracy, equality, justice and peace. Given existing realities in South African schools this cannot happen overnight and indeed will be a long-term process. The sooner we start, however, the sooner our goals may be realised. What we will need to do is move beyond the languages of critique prevalent in the South African curriculum reform debate. Further, we need to recognise the utopia of languages of possibility and instead seriously consider languages of probability for curriculum reform in South Africa. The South African OBE model provides spaces for transformation which did not previously exist. (p. 79)
Yet when it comes to implementing curriculum changes, the issues run very deep indeed. For there is no escaping the fact that even in developed countries with well-qualified teaching forces and a multitude of support factors favourable for change, successful implementation has proved difficult at the best of times. In the case of developing countries the current conditions and educational practices are so unfavourable, and the conditions necessary to support change so noticeably absent, that Van den Akker (1998) questions whether the gap is not in fact too large to even attempt some of the ambitious curriculum initiatives planned. We read this as a caution, seeing as the South African education system spans such a range of contexts – from affluent First World, to impoverished rural Third World; from schools which have endured years of extended political contestation to those whom apartheid privileged and thus essentially left untouched.

Furthermore, whereas over the past twenty years the experience of many teachers in countries throughout the world has been of continuous curriculum change, often externally imposed and soon succeeded by further change, this has clearly not been the case in South Africa. Indeed, it can be argued that prior to the latest wave of reforms, the country was effectively trapped in what amounted to a decades-long curriculum time-warp.

This is no more evident than in a subject such as physical science. Over the years, numerous articles have drawn attention to the poor state of science education in South Africa. For instance, Kahn (1993, p. 13) sums up the situation when suggesting that “the picture is one of a colourless science, poorly taught [and] involving little contact with experimental activity”. In many respects, the science curriculum followed what Robyn Millar (1987) describes as the “standard science education” (SSE) view of scientific method and experimentation. To elaborate, it is worth quoting him in full:

The popular image of science is of knowledge discovered in laboratories through experiments which validate the knowledge and guarantee its reliability and trustworthiness. The rhetoric of school science draws on this popular image, justifying the prominence of experimental work by pointing to parallels between the pupils’ activity in the classroom and the professional activity of scientists. This image of school science has proved a constant strand in science education writings for the past twenty years and more. (p. 109)

An “inquiry approach”, which emphasizes hands-on, student-centred, discovery learning attained the status of near orthodoxy among some science educators in South Africa. Furthermore, notwithstanding the obligatory idealised statements of intent which for years prefaced official syllabus documentation (such as, “students should be encouraged to do independent investigations”) the syllabi were so content-dominated that science was rarely, if ever, presented as being anything other than a disconnected sequence of ordered facts – hence Khan’s (1993) observation that few students had the opportunity to engage in practical work.

But perhaps most damning of all, the focus on content and the academic bias of the syllabi tended to encourage rote learning and transmission modes of teaching,
something which Muller’s (1987) research revealed to be a tendency present in science classes at all levels in South African schools.

For years then, science syllabi, which by and large defined teaching and learning in the subject, remain firmly locked in the past. Not only did they fail to relate to children’s life experiences, but they allowed little scope for dealing with current and, more importantly, local issues. Consequently there remained at all levels of the curriculum a distinct lack of relevance.

As someone who has plied her trade as a science teacher for more than a decade, this is, as it were, the default setting of Nomzamo’s own practice, and the base from which she must work while attempting to bring innovation into her classroom.

1.3. THE ROLE OF TEACHERS AT A TIME OF INNOVATION AND CHANGE

Across all subjects, the centralised, highly prescriptive curriculum and the system of authoritarian control, which characterised apartheid education, effectively discouraged the professional initiative of most South African teachers. The doctrine of fundamental pedagogics has also had profoundly detrimental effects on teachers’ thinking and practice. This, we believe, has major implications for the present reform initiatives, particularly as one of the most significant lessons from curriculum development elsewhere in the world is that successful curriculum innovation hinges on teachers, who are the key to interpreting policy visions.

While the official position is quite unequivocal in acknowledging the central role that teachers will play in the implementation of OBE at the classroom level; what seems to be lost in the rhetoric is an acceptance that the introduction of any new curriculum poses a range of challenges to teachers with regards to the underlying assumptions and goals, the subject demarcations, the content, the teaching approach and the methods of assessment. Indeed, the difficulties that teachers face in introducing innovative programmes into their classrooms have been documented by a number of researchers as being overwhelming.

Here we surely need no reminding that it is axiomatic that educational policy implementation is far more complex than policy formulation, and that there is a vast gap between established educational practices and new education policy principles (a point made in Crossley and Vulliamy, 1984, amongst others). If we return to Curriculum 2005, the successful implementation of such a radical system (relative to what precedes it, that is) clearly demands significant changes in both the pedagogy and the professional practice of teachers in the classroom. Gray (1999b) highlights some of the implications of this for science education — teachers will no longer use pre-determined curricula, supported by standard textbooks. Instead, teachers are expected to become curriculum developers, producing material to suit their context, with an emphasis on the development of appropriate skills and attitudes and a de-emphasizing of science content knowledge. Teachers are also to move away from a “transmission” mode of teaching towards more “mediated, constructivist” models of learning — all of which implies a radical departure from existing practices on the ground.
Again, international research has shown that it is typical for teachers to experience great difficulties in making the sorts of changes to their practice demanded by shifts towards student-centred learning and as noted by Van den Akker (1998), the problem in developing countries is even more severe.

The lessons are clear – without considerable teacher-support and development, curriculum initiatives will invariably fail to be implemented as intended by the purveyors of policy. As Webb (1997) quite succinctly sums it up:

Teachers’ relationships to change and innovation are very intertwined with many other features. In order to gain any significant instructional change, one must first reach vast numbers of teachers, who differ greatly in their beliefs, content knowledge, preferred teaching styles, and the conditions under which they teach. The differences among teachers are so great, and their participation so varied, that any classification of their roles greatly simplifies a multifarious reality. As Tolstoy cogently depicted in *War and Peace*, the great battles are won or lost by individuals in the field acting upon their own interests, motivation, and will to win, influenced little by the commanders, generals, and others acting from headquarters far behind the front lines. (p. 73)

Reflecting on the situation as it unfolds in South Africa, it does seem somewhat ironic that the present process of curriculum development in many ways replicates the “centre-periphery” models of the past. The problem is that such an approach to curriculum development, in which content is developed and refined at one level to be implemented at another level, reduces the teacher’s role to that of a technician given the responsibility of putting the designers’ theories into practice. In the face of such a reform, it is hardly surprising that teachers react negatively or apathetically to new programmes which do not fit their educational contexts or match their inclinations or capabilities. Pedretti and Hodson (1995) put it as follows:

This approach to curriculum development fails to identify and engage teachers as the key agents of change [our emphasis], and ignores the uniqueness of educational settings ... No account is taken of teachers’ own experiences, personal theories and values. No account is taken of the particular constraints of particular learning/teaching environments. Educational change is seen as independent of the social context in which it is formulated and the social context into which it is to be implemented. Curriculum implementation problems are conceptualized in terms of teachers’ failure to understand the designers’ intentions ... Continued failure of the innovation can and will be blamed on the teacher. (p. 467)

The challenge clearly lies in finding ways to actively engage practising teachers more directly in the curriculum development process. Yet this is not an easy matter at all. For a start, in order to move beyond the traditional notion of “teacher as technician” in the curriculum implementation process, the teacher’s role needs to be conceptualised in more complex terms. For the introduction of any new curriculum material is by no means “pedagogically neutral” and the implications
of any change (however gradual or incremental they might be) necessitate, as we have argued above, a reconsideration of teaching/learning methods and priorities and strategies for assessment and evaluation.

Nor is it a value-free activity – for the teacher who is tasked with implementing curriculum changes in her classroom, it involves a reconsideration of what Bruner (1986) would call the teacher’s “stance” towards (amongst other things) knowledge, scientific inquiry, learning and education in general. In this respect, one also needs to acknowledge that a teacher brings to the task of teaching a personal complex of beliefs, assumptions and experiences that collectively constitutes the “educational situation” within which change occurs.

This point seems particularly relevant to us here in South Africa – a country with a system of educational provision that spans a wide range of contexts, staffed by teachers whose levels of preservice training differ markedly, and whose experiences (and expectations) of teaching and learning differ in turn by extremes.

In order to make sense, then, of the problems teachers experience with changing their practice, it is critical that one develops a sense of the classroom and school world as they see it, for it is only then that one can begin to understand more of the meanings and frameworks of their actions. Teachers are undoubtedly “key agents of change”; perhaps it would be useful to extend this metaphor to view our teaching corps as a highly complex amalgam of groupings of practitioners, who, as “keys”, come literally in all shapes and sizes, able to “fit” any number of doors.

Developing then our understanding of how teachers can be used to unlock the door(s) of curriculum change is a challenge to be faced throughout the world.

1.4. OVERVIEW OF BOOK

Chapter 2 begins the process of building a descriptive account of the context within which Nomzamo plies her trade as a science teacher. Following a brief introduction to what we have called Kubukene township, we will enter the school for the first time to be presented with a description (at this stage, on a somewhat “bricks and mortar” level) of Yengeni High. This leads into an account entitled “Gangs, gangland and vigilantism”, which we have included in order to help locate the “school in community”. We will then turn our attention to the children, and learn something of the hundreds of students whom Nomzamo teaches on a daily basis. We will then raise a number of general issues relating to the students that have an important bearing on subsequent events during the trialling exercise. Finally, we introduce the work of the “Science Through Applications Project” (STAP), the curriculum development project whose materials it is which Nomzamo trialled in her classroom.

The first major theme to be explored in the book is the extent to which context plays a powerful role in influencing the development of a teacher’s pedagogy.

In Chapter 3, the spotlight will fall on “School and staff” to reveal, in the context of large, overcrowded and under-resourced schooling, the extent to which deeply ingrained practices of both teaching and learning are (often quite inadvertently) potential inhibitors of change. The first half of this chapter is devoted to
considering how a range of contextual factors, grounded in the overall functioning of the school, has a significant effect on Nomzamo’s attempts to bring about change in her classroom. When it comes to the staff, it will become clear just how much Nomzamo’s actions are heavily influenced by the institutional practices and working relationships of the community of teachers at Yengeni High, as well as the extent to which having to function as a constrained individual without the benefit of a collaborative, supportive group of fellow teachers, has a negative impact on her practice.

As the trialling exercise progressed, it became evident just how much students were being asked to change their practice and adapt to new ways of learning. Clearly no easy task, particularly given the dynamics of Nomzamo’s classes which were filled with such large numbers of students who varied by degrees in both ability and motivation.

Chapter 4 is devoted then to considering how students too, play a pivotal role in limiting a teacher’s attempts to shift the focus of teaching and learning in her classroom. Here it will be argued that complex issues relating to language and culture need to be carefully considered, not least the problems faced by both teacher and students in having to study science through the medium of a second language. In order to develop a more critical understanding of the “dynamics of change” in a context such as Yengeni High, the introduction of innovation in a classroom will be conceptualised in terms of a dual process – whereby a teacher has to grapple simultaneously with changes to both her own and her students’ practice.

Yet whatever role “school, staff and students” play in influencing the development of a teacher’s pedagogy, it is the teacher’s person or self which remains the final arbitrator in determining what emerges as classroom practice. In our study we have adopted an approach advocated by proponents of life-history research (such as Ivor Goodson), who have called for a return to the use of personal biographies in studying educational issues.

To this end, Chapter 5 is devoted to a narrative account which highlights those aspects of Nomzamo’s career and life history which she articulates as having played (or continue to play) a major role in influencing her work as a science teacher. This account will also serve to introduce the reader to the striving, purposeful science teacher alongside whom Jonathan worked over the months of their collaboration together.

With Chapters 3 to 5 having provided the platform from which Nomzamo’s professional actions can be considered, the focus in Chapter 6 shifts to her personal experiences during the implementation of the STAP programme in her classroom.

The discussion which follows is structured around a consideration of three main categories of teacher knowledge. The impact which working in a dysfunctional school setting has on Nomzamo’s general pedagogic knowledge will be considered first. The extent to which her subject matter knowledge is, like her general pedagogic knowledge, context-bound and influenced by amongst other things the nature of the interactions between herself and the students she teaches
LESSONS FROM THE CONTEXT-BOUND CHALKFACE

will be next. The third (and most extensive) point of focus will explore through a number of narrative accounts, specific examples of where Nomzamo came to confront, and then work through, limitations in her own instructional practices in ways which led to the growth and development of her pedagogic content knowledge. This in turn will provide an important vehicle for considering, from Nomzamo’s own perspective, some of the complexities of the change process.

We will also acknowledge the pivotal role which a reflective dialogue plays in assisting a teacher to reflect on her teaching. And confirm that the collaborative partnership between Nomzamo and Jonathan played a key supportive role at the time that she was grappling to come to terms with the changes being wrought in her classroom.

We will draw Nomzamo’s story to a close in Chapter 7 by forging a link between the trialling exercise and Nomzamo’s post-STAP experiences, and in so doing consider issues pertaining to what we have termed “the continuing dilemma of continuing change”. This will lead, by way of conclusion, to Chapter 8, where we will take the opportunity to highlight what we believe are some of the more significant insights which have emerged from this study.

NOTES

1 In the period from 1994, Jansen (1998) identifies three national curriculum reform initiatives which have focused on schools. The first was an attempt to purge the apartheid school syllabi of racially offensive and outdated content; while the second introduced continuous assessment into schools. The third, and most ambitious curriculum policy being the introduction of OBE and the launch of C2005. [See Jansen, J. (1997). Essential alterations? A critical analysis of the State’s syllabus renewal process. Perspectives in Education, 17(2), 1–11.]

2 The year 2005 indicates the final year of implementation in all school grades, as originally planned.


4 Department of Education (1997a).

5 Department of Education (1997b).

6 Mason (1999).

7 Sanders (1999).

8 For example, Chisholm and Fuller (1996), De Clerq (1997) and Mason (1999).


10 It may well be, as Jansen perhaps somewhat cynically concludes, that OBE as a reform movement is an act of political symbolism, in which the primary preoccupation of the state is with its own legitimacy, and as such has very little to do with bringing about substantive change to teaching and learning in the classroom.

11 By way of example, Jansen points out that the management of OBE multiplies the administrative burdens placed on teachers – they have to reorganise the curriculum, increase the amount of time allocated to monitoring individual student progress against outcomes, administer appropriate forms of assessment and maintain comprehensive records.

12 Le Grange draws on the work of Deever (1996) who develops what is (in our opinion) a pragmatic approach which acknowledges that appropriating a language of probability involves accepting that

9

13 This is a point made by Levin and Riffel (1998). In the international arena, the progressive movement of the 1960s was replaced by the “back to basics” of the 1970s and early 1980s, and has been followed by a whole variety of other movements.

14 The effectiveness of this approach to teaching science has long been called into doubt. In particular, it has been sharply criticised for reflecting an inadequate understanding of the nature of scientific knowledge and the processes of science. It has been more than twenty years since Woolnough (1983) quite bitingly described guided discovery learning as being at times no more than “stage managed heurism”. [Woolnough, B.E. (1983). Exercises, investigations and experiences. Physics Education, 18(2), 60–63.]

15 Fundamental pedagogics is a homegrown South African product which, drawing on Dutch phenomenological philosophy, claims to have developed a science of education. Useful critiques of fundamental pedagogics are provided by:


16 Taylor and Vinjevold (1999).


18 This is made plain in the official documentation – see Department of Education (1997b).

19 Newstead and Bennie (1999).


21 Although his comments naturally apply across all subject/learning areas.


23 In any event, Brodie (1998) makes the point that generalised calls to teachers to make a shift from the “old” teacher-centred practices, to the “new” student-centred approaches are not helpful. While teacher mediation is crucial, it is a complex practice, and dichotomies such as “facilitation” and “non-intervention”, as opposed to “direct teaching” are not useful in delineating helpful from unhelpful practices, nor in indicating where particular strategies can be improved to enable better learning. [Brodie, K. (1998). Teacher- or learner-centred: How do mathematics teachers in South Africa teach? In Ogude, N.A. and Bohlmann, C. (Eds.), Proceedings of the Sixth Annual Meeting of the Southern African Association for Research in Mathematics and Science Education. Pretoria: University of South Africa, pp. 85–92.]


25 Rizvi and Kemmis (1987) (cited by Hart and Robottom, 1990) describe this model as follows: the curriculum is developed at the “centre” by experts in the education department, who then oversee programme development and implementation (by teachers), which occurs at the “periphery” (i.e. in classrooms).

26 A point made by Hart and Robottom (1990).


28 Clandinin (1986).

29 Or a “thick description” as it is referred to in the literature of qualitative research (as in Lincoln and Guba, 1985, and Magoon, 1977).

30 Using the framework proposed by Shulman (1986, 1987).
Nomzamo is by any measure a remarkable person, a striving purposeful teacher whose professional career has been characterised by a continual seeking out of opportunities to “build herself professionally” (as she puts it).

One of her latest involvements has been with STAP, a curriculum research and development project located at the University of the Western Cape. With its emphasis on student-centred activities and collaborative group work, the STAP materials embody an approach that is markedly different from those generally adopted in South African schools. With students being encouraged to take more responsibility for their own learning, the pedagogy inherent in the “STAP approach” also requires a significant shift in teaching style, not only in terms of instructional practices, but also in how the teacher manages a broader role in the classroom.

During the trialling of the STAP materials in other schools, Nomzamo visited teachers and listened to them (and their students) unanimously pronouncing the programme “stimulating and useful” yet heard too of their difficulties as they sought to shift the emphasis of their pedagogy away from “chalk and talk” and faced the challenge of having to rethink, often in quite uncompromising ways, the nature of their everyday practice. She sat and watched the various ways in which the STAP programme demands a measurably higher level of teacher and student engagement than conventional science lessons, and observed first hand, the teachers’ struggle to develop teaching and learning strategies that would allow them to make fuller use of a more flexible curriculum resource such as STAP.

Now it is Nomzamo’s turn, for she has agreed to trial the latest draft of STAP’s Grade 9 programme in her four classes at Yengeni High – the large, over-crowded and under-resourced secondary school where she is the senior science teacher . . .
CHAPTER 2

SETTING THE SCENE: THE TOWNSHIP, 
THE SCHOOL AND ITS STUDENTS

2.1. KUBUKENE TOWNSHIP

Kubukene is no different from so many other townships that mark the urban landscape of South Africa. From the time when the first dwellings were built in the early 1960s, its history reflects the struggle of African people against apartheid, in particular against the segregationist policies which sought to deny them the right to live and work in white urban areas.¹ For many years, the Apartheid State pursued a deliberate policy of providing poor-quality housing, and the provision of other basic facilities – schools, clinics and recreational areas – was withheld.

The inevitable outcome of this wanton neglect and under-provision of basic facilities is the over-crowding, squatting and squalor found in townships occupied by Africans to this day. Following the abolition of the “pass laws” in June 1986 these problems have been compounded by the dramatic increase in the number of African people moving into urban areas.²

While great strides have been made in the past few years towards addressing infrastructural inadequacies (such as sewerage, water supply, electricity, telephones and rubbish disposal) and while there has been a steady improvement in the provision of basic social services, the quality of life for many of the people who reside in Kubukene remains marked, not just by poverty, but also by high levels of crime and violence.³

2.2. YENGENI HIGH SCHOOL

Yengeni High is set deep in the residential heart of Kubukene. It is one of the oldest schools in the township and moved twice before settling in its present location in the early 1970s. Surrounded by wire-mesh fencing, the buildings face away from the busy road which fronts the school and are bordered on the other three sides by the shack-filled yards of the small, semi-detached dwellings that are characteristic of much housing in the township.

Over the years a number of prefabricated classrooms have been added to the assemblage of single-storey brick buildings which make up Yengeni High, so that now there is a ragtag collection of 34 venues of different sizes⁴ – all in various states of disrepair. In addition to the classrooms there is also a single laboratory, one home economics centre and a room that houses the small, but well organised school library. In one of the buildings, the partitions between two classrooms have been removed to create a larger venue. This room functions as a “hall” of sorts,
although it cannot accommodate more than 100 or so students (let alone the whole school). All the classrooms are fitted with fluorescent lighting and a single power point, many of which are periodically stolen or vandalised.

A rundown block of toilets is set off to one side of the school, behind which there is a small storeroom containing little more than an assorted collection of broken tables and chairs. The dilapidated remains of what were once a tennis court, and a rubble-strewn field with rugby posts at each end, are the only recreational facilities available – although no one plays rugby and the school soccer team practices at another venue.

The administration block lies at the centre of the school and contains the staff room, staff toilets and a number of offices that are shared by the various senior staff – the departmental heads (HODs) and the second deputy principal.5 There is a single public phone and a small kitchen for the teachers’ use. The staff room has a number of standard-issue teacher’s tables (there is often no space for them in the overcrowded classrooms) and plastic chairs similar to the ones that the students use. The cupboards dotted around the room are shared amongst the teachers, most of whom have been allocated a single shelf each.

The principal and his first deputy have rooms in a separate wing of the administration block, which also contains the empty secretary’s office. Most of the school’s printing is done here, on a Roneo machine in the first deputy’s office; while an old photocopier in the principal’s office is carefully nursed from one breakdown to the next. In recent times there has been a spate of burglaries at Yengeni High and all (remaining) valuable items – ranging from the school stamp to the soccer team’s “kit” are kept carefully locked away in a walk-in safe which, with its concrete ceiling, is the only really secure room in the entire school.

There are 29 class groups at Yengeni High. The junior classes are almost all seriously overcrowded (they are rarely less than 60 students assigned to each class). Here the limiting factor is the shortage of classrooms, which places severe constraints on the number of class groups that can be accommodated. While there are a few unoccupied rooms these are almost always in use by some of the “split subject groups” that inevitably arise in a typical school day. Clearly, the school is bursting at the seams.

The school has a staff complement of 51 teachers (which includes the principal and the other senior staff) for a student body of just over 1,850.6 At the time of the trialling exercise, besides the caretaker and his helper, no other non-teaching staff was employed at Yengeni High. Consequently, all of the basic day-to-day administrative duties have to be handled by the principal or shared out amongst his two deputies and/or the HODs.

In terms of financial support, the subsidy from the local education department is based on the number of students at the school. While the education department provides funding to cover the cost of textbooks and stationery, the undersupply of textbooks is almost always a problem.7 With no cash reserves of its own worth speaking of, the school is forced to operate in financially constrained circumstances and, given the level of poverty in the local community, the school struggles to attract additional funding and is hard pressed to collect even its modest school
fees. Whatever money does come in tends to be swallowed up by the day-to-day running costs of the school. For example, with so many students to provide for, the end-of-year examinations consume a considerable volume of printing paper and ink, which the school can ill-afford to purchase out of what is, by that time of the year, a depleted school fund. Faced with such expenses, there is precious little money left over to build up a bank of resources that can enrich teaching and learning (there have been a spate of burglaries in recent years).

While the school does receive an annual maintenance grant from the education department, given the poor state of repair of some of the classrooms, this money tends to get used up within the first six months of the year. If a more serious problem arises, the school has to join the queue petitioning the department for additional funding and endure the not unexpected bureaucratic delays which invariably ensue. An illustration of this arose during the trialling exercise, when the roof of the home economics centre collapsed, and there was an almost two months’ delay (and a number of very wet and rainy days) before work commenced on a new roof.8

The poor state of repair of some of the prefab classrooms was a constant headache during the trialling exercise, and since one was the homeroom of one of her classes, it was a problem which directly impacted Nomzamo’s teaching. The following accounts reflect the steady disintegration of this classroom over a period of a couple of months:

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 May</td>
<td>The floor has started to cave in near the back of the classroom. Besides the inconvenience, it means</td>
</tr>
<tr>
<td></td>
<td>that there is less floor space upon which to rest a chair and it creates a hazard for anyone trying</td>
</tr>
<tr>
<td></td>
<td>to move around the class.</td>
</tr>
<tr>
<td>28 May</td>
<td>The gaping hole in the floor seems to be spreading – two more sections have collapsed now and some</td>
</tr>
<tr>
<td></td>
<td>students’ chairs are literally hanging on the edge of these holes. The leak in the ceiling is also</td>
</tr>
<tr>
<td></td>
<td>worse after this week’s rains and a number of the ceiling panels are starting to peel off.</td>
</tr>
<tr>
<td>Later</td>
<td>Later in the day, the principal pops his head in the door to view again the latest damage. He is</td>
</tr>
<tr>
<td></td>
<td>clearly disturbed by what he sees and says that he will ask the contractors, who are still busy</td>
</tr>
<tr>
<td></td>
<td>putting the final touches to the Home Economics Centre’s roof, to give him an idea about how much</td>
</tr>
<tr>
<td></td>
<td>it will cost to shore up the floor and fix the leaking roof. Walking back to the admin building, he</td>
</tr>
<tr>
<td></td>
<td>talks of the uphill battle to stop the school falling into disrepair with such a small maintenance</td>
</tr>
<tr>
<td></td>
<td>budget. As he explains it, most of this year’s money is going to be consumed by routine work such as</td>
</tr>
<tr>
<td></td>
<td>fixing up the lights, mending broken windowpanes and replacing stolen locks and doors.9</td>
</tr>
</tbody>
</table>
8 June: The floor has collapsed further and two of the girls in the group at the back of the classroom have taken to standing up/leaning over their table, which is balanced somewhat uneasily across one of the holes. Next to them, two other students have actually taken to resting their chairs on the bottom of the hole, i.e. on the pavement of the schoolyard – a somewhat comic sight which lightens an otherwise depressing scene . . .

28 July: How much worse can conditions get in this classroom? The group of girls at the back have now had to move. A broken chair lies discarded in the hole and their two abandoned tables lean precariously against each other, catching the dripping water from the leaking roof which puddles on the floor. Fresh cracks are now spreading to other parts of the floor, which grows increasingly unsteady beneath one’s feet. To add to the mess, the holes in the floor have started to fill with discarded sweet and chocolate wrappers and empty cool drink tins. And the damp piles of rubbish are starting to smell. Yet ironically enough, although the classroom might be on the verge of abandonment, all the broken windowpanes have recently been replaced and all six fluorescent lights shine brightly to dispel the gloom of a mid-winter’s day.

A similar problem with two other prefab classrooms resulted in their abandonment for the rest of the school year.

While it must be recognised that the material conditions at many black schools are far worse than those experienced at Yengeni High, it is worth closing our brief introduction to the school with the sobering (and undoubtedly highly debatable) thought that when it comes to school resourcing, conditions under which teaching and learning take place at Yengeni High are in some respects as constrained today as at any time during our recent apartheid past. As Nomzamo so pragmatically put it:

Nomzamo: But there are things that you can never change.
Jon: What can’t you change?
Nomzamo: The numbers for instance, you can never change the numbers [of students and the student/teacher ratio] at Yengeni. Because the numbers at Yengeni will stay like this as long as we have 51 teachers and these buildings that we have. So the only solution is a new school building and that is 15 to 20 years down the line. So we are actually stuck with this for the next 15 years or so, so you just have to learn to live with it and make the best out of it that you can . . .

This is not to say that some things have not improved in recent years – they clearly have. But some of the perennial problems remain – as noted above, the pivotal limiting factor at the school is not a shortage of teaching staff but of available classrooms, which, together with the ongoing shortfall in other educational resources – be they textbooks, teaching aids or supplies for the science laboratory – defines Yengeni High as a typical under-provisioned township school.
Given the considerable impact which the activities of youth gangs seems to have on Nomzamo’s practice (and the events which unfolded later in the year), they are therefore a specific aspect of “school in community” that is worth dealing with separately.

2.3. GANGS, GANGLAND AND VIGILANTISM

As alluded to earlier in this chapter, townships like Kubukene are characterised by a high level of crime, and Yengeni High has the particular misfortune to be situated in a part of the township that has been plagued in recent years by a growing problem of gang violence. Whilst it is unclear just how many of its own students are involved in the activities of these gangs, fighting during the year resulted in the death of at least two of the school’s students.

The indirect impact this violence seems to have on schooling at Yengeni High is worth dwelling upon. First and foremost, the area around the school is dangerous and this creates an underlying anxiety for both teachers and students. As Nomzamo put it during one of the interviews:

… particularly the place that the school is in, it is not at all conducive to good learning – this is the worse place [her emphasis]. Maybe if the school were somewhere else, and even the area was much better than what it was, maybe it would help!

In the past there have been incidents where teachers have been robbed, so Nomzamo is naturally wary about finding herself alone at school after hours (most other teachers tend to leave school as soon as possible after the end of school). This means that besides one hour per week of extra lessons with her Grade 12 students, Nomzamo is reluctant to schedule extra-curricular activities with her other science students. Nomzamo struggles to reconcile this constraint with her professional sense of duty in which she views her role as a science teacher in broader terms than simply one of teaching the syllabus.¹¹

Whenever there were gang fights in the area (as in the killing of the two students mentioned above), the school was affected for days afterwards – the students tended to be restless and distracted and class attendance, which was erratic at the best of times, suffered as well. Naturally, this was something that could be very frustrating for Nomzamo:

Nomzamo: They [the students] were worse today, I dunno . . .
Jon: You felt it as well?
Nomzamo: Ja . . . the other thing is with this thing of gangsterism and so on going on, their minds just get taken up with what is happening outside. So, that’s another thing – and you will find that they are busy talking about this grouping [of gangsters], or whatever . . .

(Later)

Jon: It just felt as if they [the students] are not there, they’re not engaging!
CHAPTER 2

Nomzamo: Ja, and yesterday some kid had to be rushed away because there were skollies [gangsters] who came in to hunt him . . . so he had to be hidden out of the school.

(He agreed with me that the students just were not interested.)

Jon: It’s as if there’s no spark . . .

Nomzamo: The spark is this thing which is going on! This is what they are keen to talk about . . . particularly the boys. Even the boys’ attendance is dropping because some are running away [from the gangsters]; some are staying at home just until they see how things are.

If anything, the situation deteriorated as the year progressed. During the run-up to an inter-school science competition which Nomzamo helped organise, one of her major concerns was a fear that gangsters would disrupt proceedings. While the event itself was a great success and passed without incident, Nomzamo’s sense of foreboding was not entirely misdirected – a car filled with visitors from a local university was held up at gunpoint as they were leaving the venue. Fortunately, no one was hurt.

Soon after this competition, the local community’s frustration with the police’s inability to deal with the rising level of crime in the township boiled over. “Spiralling crime: Angry citizens strike back” proclaimed a banner headline in a local newspaper, and an accompanying picture showed a naked man being escorted along a street by men carrying sjamboks (quirts). In conjunction with drivers from one of the local taxi associations, residents had begun a vigilante campaign aimed at local criminals (“these youngsters are terrorising us and they must be taught a lesson” a spokesperson was quoted as saying). Alleged offenders were subjected to a particularly South African version of street justice: after a summary trial at the local taxi rank, the “guilty” person(s) was given a violent public beating before being paraded naked around the township. As the weeks passed, the beatings became progressively more severe and eventually a number of people were killed.

Given Nomzamo’s previously articulated fears for her personal safety and the fact that the taxi rank is within a couple of hundred metres of the school, she had strong opinions to share:

Nomzamo: Their number is 10333, not 10111 [the police emergency number]. If you call them [the taxi drivers], they come immediately and they attend to what you are saying immediately. Unlike 10111 . . . (she laughs)

Jon: And the police just stick around or keep out of the way?

Nomzamo: They stand there, and watch! And then the ambulance also comes, and then it waits until the beating is finished and then it takes them to hospital. So there’s nothing they can do. Even the police they just stand there and watch.

(Later)

Jon: How has it made the atmosphere at the school since it started?

18
Nomzamo: It hasn’t really disturbed the school except if it happens over lunchtime. Then if they [the students] have to come back and there’s something still going on there, and then they will want to stick around and watch. But then the other time, the taxi men came here to the school and they said they don’t want to see Yengeni kids there watching when they are doing their thing – after a misunderstanding over a [local] TV interview which happened.

The taxi men claimed that one of the kids who was wearing a Yengeni uniform, appeared on TV and was saying that they don’t like what the taxi men are doing, it’s very barbaric, they are people who are barbaric and uneducated. So they came here to the school looking for that child, and wanted to know if this is the view of the school or . . . So the parents were called in to go and apologise to the taxi men because they were very angry actually. And then the school apologised on behalf of the school. Although they told them that she [the student] was saying her own thing, she was not sent by anyone to say that. In fact we are not against what they are doing, if it is putting the township into order.

Jon: What do you feel?

Nomzamo: I think it’s great! We are afraid to walk around wearing earrings because of these kids [gangsters]. So if there is someone who can sort them out, let them do . . . It’s actually teaching people a lesson, even those kids who used to come here selling things – computers, stolen things. They don’t come any more. They are saying: “Yho, the taxi men . . .” Which means that even that black market of stolen things is going to end. Then people’s things are probably going to be safer now. We walk around now without taking rings and earrings off because we know that within this area you are safe. Taxi men are watching over whatever could go wrong . . .

(Later)

Jon: So, it gives people a greater sense of security and that sort of thing. Is that quite a common feeling amongst the staff?

Nomzamo: Ja.

Jon: Is anyone opposed to it?

Nomzamo: No-one. I’m not saying it’s a nice thing, seeing someone being beaten to death. I’ve never watched anyway, I’ve never gone closer to the whole thing.

Jon: Do some people [teachers] go and watch?

Nomzamo: Ja, some people do go over and watch . . .

These events are a poignant reminder that violence is resorted to, not only in reaction to political but also to social problems, and reinforces the commonly held view that violence has become part of the fabric of many South African communities. That the school had to apologise for the “wayward” comments of one of its students also points in quite sobering terms to the complex (and in this
instance potentially dangerous) dynamics that exist between Yengeni High and elements in the local community.

2.4. THE STUDENTS

As part of her teaching load, Nomzamo is responsible for teaching general science to a total of 238 students in four Grade 9 classes. All four classes are, to varying degrees, overcrowded – ranging in size from the 9E’s, which is the smallest with 47 students on the roll, to the bloated 9C class with 71 students.

Many of Nomzamo’s students live within walking distance of the school, while some travel by bus from one of the informal settlements or neighbouring townships. Most children come from what are, in a South African context, typical urban working-class families. Nearly half of them come from single-parent families and, as is common in this community, nearly all live with one or more members of their extended family. A small but still significant number do not live with their parents at all, but typically with one or more of their grandparents.

The students range in age from 13 to 21, with the majority between 15 and 16 years old; the boys are on average slightly older than the girls. Yengeni High is deeply embedded in a Xhosa cultural and linguistic milieu, with only ten of the Grade 9 students indicating that they speak a primary language other than Xhosa.

While some students were born outside the city, only a handful are recent arrivals. Most children had attended one of five primary schools in the immediate vicinity surrounding Yengeni High. While this may be of little or no significance, it does perhaps point towards a fair degree of continuity within the school community; for instance in 9D, 12 students had attended the same primary school together.

Faced with so many students, it is hardly surprising that at first it becomes difficult to distinguish, in anything other than the most general terms, between the four classes. Besides the 9E’s who are perceived by their teachers as being, on average, academically more able, the other three classes are typified by the kind of extreme mixed-ability grouping so common to township schools. Yet for all that, as the trialling exercise progressed, each class began to emerge in sharper focus, each characterised by its own dynamic of student-student interaction, each evolving its own special relationship with Nomzamo and, critically, each responding in different ways to the innovation which was STAP.

Here are snapshots of the 9C’s and the 9E’s, the two classes who represent, in Nomzamo’s eyes at least, the extremes of ability/motivation with which she has to cope.

The Grade 9C’s

The 9C’s are the largest of the four classes with 71 students (or thereabouts) on the register. Given its unwieldy size, and generally more erratic pattern of student attendance, it is really no surprise at all that there was always some confusion about exactly how many students there were in this class. With an almost equal
split of girls and boys, it has a significant number of students (10) who have failed a grade since reaching High school – five have repeated Grade 8, and five were repeating Grade 9. Because of these “repeaters”, it is also the class which has the biggest range in ages – two students are still only 13 years old, whilst eighteen are 17 or older and the oldest student is 21 years old.17

Walk into their home room and it’s a picture of squalor and poverty: a dusty floor, scattered with discarded sweet wrappings, chip packets, tissues and scraps of paper; broken window panes and the faded paint on grimy, bare walls. “Tyson II”; “F… you” and “I love ladys”, are but some of the scribbles and scrawls of graffiti which cover the display board spanning the back of the classroom. Look up and you’ll see a sagging ceiling with its torn, shredded panels attesting to the poor state of repair of some of the classrooms and the random acts of vandalism that the school periodically endures.

On a “good day” one is faced with the sight of more than 65 students, some seated two to a chair; jam packed into the four rows of desks which crowd the room. Since daily attendance was quite erratic in 9C, on most days there were usually more manageable 50 or so students in class.18 Irrespective of the number of students attending, the front row of desks reaches almost to the chalkboard; and there is hardly enough manoeuvring space to allow a teacher to write freely on the chalkboard or turn around and comfortably face the class.

Even though the 9C’s, like most other students at Yengeni High, spend virtually the entire school day cloistered together in their classroom, it is a bleak, colourless place with no decoration of any kind adorning the walls. In response to my query about why it was that the classrooms (besides the inevitable graffiti) were devoid of posters and charts, Nomzamo explained how things just never seemed to last on the walls – teachers would stick things up and students would scribble on them and then they would either vanish or be found torn up and crumpled on the floor.19 There seems no sense of belonging, nor of ownership – visit after the students have drifted off home in the afternoon, and besides the day’s accumulated rubbish on the floor, no hint of the students remains – no clues as to who they are and what their interests may be. Without the physical presence of students, the rundown classrooms of Yengeni High are depressing places, no more than cluttered shells filled with an assortment of wooden tables and orange, plastic chairs, many in various stages of disrepair.

Given a combination of factors – its unnerving size, poor academic performance and reputation amongst teachers as being a “difficult” class, it is not surprising that of the four classes, the 9C’s evoked the strongest feelings in Nomzamo:

There was a class which I really hated initially – the 9C’s, I hated those students because they were always noisy, rowdy, you’ve got boys who were smoking dagga, were not fit to really be in class. They were the biggest [class] but you hardly get all of them at one time. I really had problems with that class!
Nomzamo articulates her dislike of this class in her typically forthright way. Clearly, even within the context of the many other difficulties she experienced in her day-to-day teaching, the 9C’s presented her with some of her biggest challenges and tested her not inconsiderable patience to the utmost at times.

*The Grade 9E’s*

By way of contrast, the 9E’s, with only 47 students on the register, is the smallest class which Nomzamo teaches. As with the 9C’s there was an almost equal split between boys and girls, and with none of the students having repeated either Grade 8 or 9 they are also the “youngest” of the four classes – their average age was just under 15 (only five of the students were 16 or older).

Like their other teachers, Nomzamo regards them as the most “academically able” class in the Grade and the “easiest” ones to teach. For a start, they were clearly a more “cohesive” class. This was manifest not only in their general classroom behaviour – where they rarely presented Nomzamo with discipline problems20 – but also in their consistently high level of school attendance. Rarely were there more than six students absent from the class.

Perhaps most telling of all was the students’ response when they missed classes because of teacher absenteeism. On such occasions, attendance “held up” in 9E much better than in other classes; on one occasion when their teachers were absent for two consecutive periods (3 and 4, on either side of the lunch break), the attendance figure of 41 out of 47 was recorded in period 1 and again at the end of the school day in period 6.21 Perhaps it is no coincidence that nearly a third of the students (14) had attended the same primary school and only two were new to the class this year.

From the moment you walk into their classroom, you can pick up that this class is very different from the others in Grade 9. For a start, the classroom is clean, and there’s very little litter on the floor. This certainly creates the impression that the 9E’s take much greater pride in their homeroom than many of their fellow students. While the walls (as with virtually all others in the school) are bare of decoration, there’s little graffiti (and none offensive). The chalkboard looked as if it had been recently washed down and the battered old 5 litre paint tin, which served as a bin, recently emptied. Being a smaller class, it is much less crowded and not only is there space to manoeuvre in front of the chalkboard but it is even possible to get to individual students by moving between the neatly ordered rows of tables and chairs.

The students are different too, they seem so much more alive and there’s an eagerness about them which is lacking in some of the other classes.

They are by far and away Nomzamo’s favourite class and this showed in the way that she talked about them. “Yes . . . the ones I enjoy the most are 9E, they are even much more livelier than the others . . . Wait till you see the 9E’s, I like them!”, is how she put it before the trialling exercise commenced. Given their status as the more able class, it is not surprising that Nomzamo chose to “lead” off with the
9E’s for the implementation of STAP, and in this respect they served as the guinea pigs of the programme.

When it comes to the students at Yengeni High, there are a number of other issues that are worth paying attention to.

2.5. LARGE, MIXED-ABILITY CLASSES

Large classes are a fact of life at Yengeni High. The figures speak for themselves – in Nomzamo’s case it is a sobering thought that with nearly 350 children in her six science classes she often sees, on days when attendance is high, more than 200 students. In the light of this, it is hardly surprising that the constraints to practice imposed by these conditions are a major factor in shaping the form and function of teaching and learning in Nomzamo’s (as in any other teacher’s) classroom.

For a start, since she is confronted on a daily basis by so many students, Nomzamo has an almost impossible task of keeping track of the academic performance of individual children. Time constraints alone preclude her from little more than fairly cursory monitoring of her students’ homework and classwork activities. As Nomzamo once remarked, “I wouldn’t even think of taking it [homework] in! I’m struggling to even mark tests. So for taking in homework, oh no . . .”.

On an organisational level, the demands of teaching such large numbers of students are further compounded by the mixed-ability nature of Nomzamo’s classes. The extent to which this is a problem is quite graphically reflected in their scores in general science tests, where there is often an extreme variation in marks.

While the reasons behind the poor academic performance of Nomzamo’s students are, to say the least, complex and multi-layered, what needs to be acknowledged is the powerful role which context plays in students’ educational achievement. In this regard, it is interesting to hear how Nomzamo makes sense of her students’ under-achievement:

Nomzamo: One thing being that our classes are too packed, and the moment you go to those classes you just get so depressed because of the huge number that is facing you and you cannot really get to each and every one of them [students], that’s one reason. Also, they are not as advantaged!

Jon: They are not as advantaged, okay – what do you mean by that?

Nomzamo: Economical advantage, social advantage. Advantage in terms of their parents are not … well educated, they cannot even offer assistance at home. Then you have got kids [elsewhere] whose father is an engineer, the mother is a sister in a hospital – he [the student] comes with a biology problem, the mother is there to help; with a physical science problem, the father is there to help. So there are those advantages that exist in other communities. Also, because of those disadvantages our kids are not as keen and as determined to learn, and the whole culture of learning is really going down the drain, bit by bit.
CHAPTER 2

Jon: When you say it is going “down the drain”, do you think things have got worse since ’94 [the first democratic elections]?

Nomzamo: The thing is, you get different problems – at that time [pre-1994] it was political issues, and now you have got gangsterism. So, who knows what it will be next year?

Jon: What would you see as being your major constraints, as you try to go about fulfilling your duty as a teacher? What would be the things that you would list? What makes your job tough here – you’ve mentioned large classes, what else would you mention?

Nomzamo: Shortage of books. The area [around the school] makes working the hardest. The whole issue of the “culture of learning” not being there in our kids. You know the other day I took the Grade 11’s to a “Year of Science and Technology” EXPO I told them before they even went there that when you come back you are going to write a report, minimum of two pages, include pictures if you can, because they were given handouts there and all sorts of things, that when you are talking about something that you saw there include pictures as well, so that there are visuals of what you are talking about. And you are going to get marks out of 20 for that outing.

We went to the EXPO, we came back and some didn’t even bother to write those reports. Some wrote only this amount (she shows me a student exercise book with only half-a-page of writing) for 20 marks, just this amount! When we spent there, something like three or four hours and they give a report only half a page long – they expect 20 marks . . . So, that at the end of the day, our kids also, they are just not serious with their work at all.

Clearly, the conditions at Yengeni High impose a range of “constraints to practice” which impact heavily on both teaching and learning at the school. Many of these constraints are not unique to a township setting, and are shared to varying degrees by teachers throughout the world. Functional-logistic problems associated with under-resourced and over-crowded classes; poverty and crime; alienated, under-achieving and poorly motivated students – all are part and parcel of the context of teaching in many different educational settings. However, what is unique about a township school like Yengeni High is that it bore the brunt of a decades-long struggle against apartheid education; and the profoundly negative effect this has had (and continues to have) on the functioning of the school, Nomzamo’s teaching and her students’ learning, is something that shall be considered at length in the chapters to come.

Before leaving this point it is important to acknowledge, particularly in the light of Nomzamo’s subsequent experiences during the STAP trialling exercise, that the demands of teaching large, mixed-ability groups requires of any teacher in any context an inordinately high level of organisational skills (and personal motivation). In this respect, it seems then almost paradoxical that a township school
SETTING THE SCENE

which is, in human terms, relatively under-resourced, actually has conditions which require the most skilful and resourceful practice.

2.6. CORPORAL PUNISHMENT

In an earlier conversation than the one reported above, Nomzamo suggested that, “motivation, respect, a sense of responsibility – these kinds of things, they are really lacking nowadays”. Besides blaming this deterioration in student behaviour on social problems in the local community (such as drug abuse and gangsterism), Nomzamo like many of her fellow teachers, believes that the abolition of corporal punishment\textsuperscript{25} has also brought about quite a fundamental realignment in student–teacher relationships. As she put it:

\textit{\ldots these days you cannot easily discipline a child because they will tell you about their rights. You want to do this, you cannot because \ldots one can sue you, you can be attacked outside. You know, these kinds of things.}

The excessive use of corporal punishment surfaces in the literature as a typical feature of South African schooling\textsuperscript{26} and its excessive use in many black schools was a long-standing grievance of student organisations during the pre-1994 “struggle years”.\textsuperscript{27} Indeed it can be \textit{argued strongly} that the students’ prior experiences of being beaten, specifically during their primary school years, have had a profound impact on the way that some of them have come to view their role in the classroom – to this day many students remain quite hesitant to “speak out” in class for fear of ridicule or punishment (this issue is elaborated upon in a later chapter). During one of the interviews, Nomzamo’s students were given the opportunity to share their experiences in this regard:

\begin{quote}
Jon: \ldots you were beaten a lot in primary school?
Students: (together) Yes!
Jon: What were you beaten for?
Luleka: For not doing the homeworks, not listening, making noise at the group.
Phelo: Failing the test.
Luleka: Coming late at school
Asanda: For not finishing the work.
Luleka: Mr. - - - - who teach me; he even beats for the notes. He said that we must copy his writing, he was not printing. He said that we must copy his writing how could we copy his writing on the board? And if you don’t have that writing he will beat you.\textsuperscript{28}
Jon: How often were you beaten?
Students: (together) Yho! most days \ldots a lot. Everyday \ldots
Jon: How were you beaten, on your hands mostly?
Luleka: Girls under their feet!
Nolisapho: On their bare butt \ldots
\end{quote}
CHAPTER 2

Phelo: At the bums! [bottom]

Asanda: My Xhosa teacher at Grade 7 beat us this way (indicating across the knuckles), and the Afrikaans teacher. And the others beat you here (indicating his buttocks) and the class teacher I was telling you about, she doesn’t care, she just beats you and asks you if you want it which way. Even if you pick it she’ll say, “Give me the back” (his emphasis). If you are a lady – under the foot, and she’ll say you must not go like you have been beaten, you must go the way that you are going [meaning that you must walk normally without indicating that you have been beaten].

Jon: Are you beaten much here [at Yengeni High]?

Students: (together) Not at all!

Luleka: It’s a free world! (others laugh)

Jon: It’s a free world?

Nolisapho: Ja, it’s a free world – you must control yourself. No-one’s going to look after you, you must look after yourself . . .

In the absence of the stick, it has become “a free world” as Luleka puts it. The students are now expected to take more responsibility for their own actions, “you must control yourself” as Nolisapho explains it. However, as students’ and (most of) their teachers’ experiences of schooling are of a system in which discipline was harsh and at times arbitrarily applied for even the smallest misdemeanour, it is not surprising that both parties struggle to define a new set of “rules of engagement”. As Nomzamo, who was herself never a great believer (or user) of corporal punishment once described it:

... each kind of punishment has its own advantages and disadvantages. Like the stick was a quick way of getting rid of the ... what can I say?, like you give them two lashes and it’s over and the lesson continues, it’s quick and all the like. Two seconds maybe three, it’s going to be over and you continue with the lesson. But now if you decide to, what is the word? – to detain, if you decide to detain them it means staying with them after school. I can’t stay after school, I’ve got to rush for my transport. When the bell rings I’ve got to pack and go, or I won’t have transport to get home. So detention is out for me.

Indeed, the struggle which Nomzamo and her colleagues have in implementing an alternative system of punishment which is not based on beating is an example of the functional problems that a township school struggles to resolve; other such problems will emerge in the pages to come as we go about locating Nomzamo within the broader school community of Yengeni High.

But before doing this, we need to turn our attention to the curriculum programme that Nomzamo would spend the next few months implementing in her classroom.

26
The Science Through Applications Project (STAP) was a school science curriculum research and development project located in the Education Faculty at the University of the Western Cape in Cape Town. Established in 1995, the work drew teachers together from a cross-section of local schools, in a project intended to increase our understanding of some of the problems and processes associated with developing learning programmes and curriculum materials, and with implementing change at the classroom level.

The project deliberately set out to bring teachers together from across the apartheid divide with two main agendas in mind. Firstly, to begin the process of bringing previously separated colleagues together for professional purposes and to develop some fundamental professional skills in the process, and secondly, to develop a package of innovative curriculum materials (for students and teachers) that would be contextually sensitive, realistic and flexible enough to be appropriate across the spectrum of schooling contexts found in South Africa.

STAP was a proponent of an STS-type (Science-Technology-Society) science curriculum. While wearing this label is not without its problems, from an STS perspective there seems to be general agreement that a clear purpose of any integrated science programme should be, as far as possible, to balance the needs of the “majority” (those who will not carry on with science) against the “minority” (who will). Accepting then that science and technology are minority activities, a legitimate goal of any general science curriculum should be “knowing about them” as Macaskill and Ogborn (1996, p. 56) put it, rather than a pretence of inducting everyone into a smorgasbord of their concepts and methods.

To this end, the STAP programme was built around a core body of useful everyday knowledge and the conceptual territory in which it resides. A further organising principle of the project’s work was a belief that many science concepts can emerge out of an exploration of applications which can be found in the everyday life experiences of students; in turn, these experiences can be used as a vehicle for developing broader science process and life skills. Structured in this way, the project’s vision was that the STAP programme represented an attempt (with limited objectives) to give meaning and substance to what a future South African “Science for All” curriculum could look like.

Out of a development process which stretched over a number of years, emerged a set of learning resources which support a more innovative approach to teaching a single topic – Electricity, at the Grade 8 and 9 levels. For each Grade, a student booklet called “Electricity in our Daily Lives” was produced, and accompanied by a separate Teacher’s Guide.

An important feature of the STAP material is that it is intentionally structured to facilitate active learning in collaborative settings. To support this approach, the material includes a range of different kinds of activities, from “minds-on during hands-on” practical work; pencil and paper exercises; group and class discussions; and role-play to investigative projects and surveys. In line with its applications-led approach, all units and investigations start off by making connections to things
that are either part of the students’ everyday experiences or to which they can easily relate. This focus is deliberately developed further in the extension materials – the “Exploring Further”, “Did You Know” and “Home Projects”, all of which form an integral part of every unit in the STAP programme.

When it comes to issues of cognition, the STAP material seeks to support the development of students’ deeper understanding by making conceptual connections to real-life situations and then providing opportunities for the students to apply their newly acquired knowledge and understanding to new (problem solving or other) situations.

As noted earlier, one of the challenges that faced STAP was to produce materials flexible enough to be used across the range of teaching contexts found in South Africa. In this regard, a particular concern has been with the needs of the majority of students for whom English is (at least) their second language (hereafter referred to as L2). Here the project had to grapple with the dilemma facing all materials developers in South Africa – how to produce a readable text which is also able to actively support the ongoing development of L2 students’ communicative competencies in English. A desire to promote the integration of “language in science” teaching is another strong feature of the STAP programme and to this end there are a number of activities which are not normally associated with conventional science texts.

One of the major strengths of the project lay in the deep well of pragmatism which informed virtually all aspects of its work. As the project believed that suitable text materials are a major agent of change, STAP’s pragmatic approach is evident in the importance it attached to classroom-based trialling. This aspect of the project’s work cannot be over-emphasized, and attempting to answer the question, “How it will work in practice?” was a preoccupation since the days when the first draft of the Grade 8 programme was completed. Indeed, a number of research papers are specifically devoted to expounding on the pivotal role which trialling has played in the ongoing process of developing the STAP material.

It is worth noting the reasons why STAP adopted this approach to curriculum and materials development, and as a backdrop to Nomzamo’s experiences at Yengeni High, dwell on (albeit briefly) some of the findings reported on the literature.

A major function of trialling is to obtain feedback on the structure and nature of the materials. Yet making decisions about the effectiveness or suitability of the materials is not a simple matter at all. This is because the success (or otherwise) of the interaction between the students and the material is directly related to the ways in which the teacher constructs her classroom learning experiences. This implies that quite careful judgements need to be made about whether the “problem” lies with the materials, or with the manner in which they are being used. All of which underscores the vital role which classroom-based observations can play in untangling and making sense of some of the complex interactions at play as teachers and students make use of the STAP material.

Here a key underpinning insight is an acknowledgement of the crucial role that students (as all-important “end-users”) can play in supplying critical feedback on
the STAP materials; to such an extent that monitoring of the “students’ voice” became an important part of many of the trialling exercises. Students provide assistance in identifying problems not only with the language of the text – such as difficulties with terminology, ambiguous or unclear statements, questions or instructions and so on – but also with issues relating to conceptualisation, particularly those aspects that research has related to visual literacy, such as the layout of the text, use of diagrams, pictures, etc.

Beyond the text, students can also provide insights into more complex pedagogical issues which may necessitate a more in-depth rethink about the structure of the materials and the teaching strategies that underpin them. In addition, students’ insights and perspectives on classroom practice can also provide their science teacher with invaluable feedback into her own pedagogic practice.38

Trialling in township schools has also brought into stark focus many of the problems which L2 students experience as they struggle to learn science through the medium of English. Consistent with findings reported before,39 many L2 students, because of their weak reading skills, remain “locked out” of text even when it is written in quite simplified English.40 The problem extends beyond reading. In general, the majority of L2 students involved in the trialling exercises also displayed poorly developed English writing and talking skills – problems which, as we shall come to consider at some length in Chapter 4, are deeply entrenched within the broader practices of schooling in this country and which reflect the widespread failure of the system of (nominally) English medium instruction to develop communicative competencies amongst many students.

Yet whatever these difficulties, the student interviews consistently affirmed the positive impact that the STAP approach had on many students’ attitudes to science. The practical activities (not surprisingly) proved particularly popular, as did the opportunities to work together in groups.

With STAP’s emphasis on student-centred activities and collaborative group work, the pedagogy inherent in the STAP approach also requires a significant shift in teaching style on the part of the teacher, not only in terms of instructional practices but also in how she perceives her broader role in the classroom. Many of the activities in the programme have been structured in such a way that they encourage a teacher to occupy a less dominant position, functioning more as a facilitator or mediator of students’ learning; something that stands in marked contrast to the pedagogical practices of most South African science teachers. Indeed, STAP conceptualised its material as providing a kind of “cognitive jolt” which challenges a teacher to rethink, often in quite uncompromising ways, the nature of her everyday practice.

Because of the access the project enjoyed to “teachers at work”, STAP was well placed to document how ordinary teachers actually cope with using innovative curriculum materials in their classroom. And although the project was initiated before the proposals for Curriculum 2005 became known, there is considerable congruency between the “STAP approach” and the aims of the new curriculum.41
CHAPTER 2

Jonathan and Nomzamo had been involved in the work of the project since its early days, so the collaborative work between them at Yengeni High was informed by previous trialling exercises. For instance, while teachers had (like their students) been unanimous in pronouncing the “STAP approach” and the materials “stimulating and useful”, the trialling had shown in quite sobering terms the extent of the difficulties which teachers face when they seek to change their classroom practice.

Here it is important to note the context within which the vast majority of South African students experience general science – taught as it is by teachers, the majority of whom are not “subject specialists” at this level. For such teachers, a topic like Electricity (which is a conceptual minefield at the best of times\textsuperscript{42}) is fraught with difficulties and is a very risky business, even when there is a more accessible and suitable text available, with a carefully thought-through Teacher Guide for backup support.

Furthermore, the STAP material not only presents teachers with the challenge of shifting the emphasis of their pedagogy away from “chalk and talk”, but the programme also requires a measurably higher level of teacher and student engagement than conventional science lessons. These are complex issues and a comment from a teacher working in a school similar to Yengeni High is illuminating:

\begin{quote}
STAP materials are structured in such a way as to afford the students the opportunity to take an active part in, and responsibility for, their own learning … I am not used to teaching in this manner and the students are not used to being taught in this way! This puts a lot of pressure on me as a teacher and the students to adopt styles of teaching and learning which we are not used to. (Cited in Clark, 1998, p. 119, emphasis in the original)
\end{quote}

Time and again, the STAP staff had listened to teachers articulate similar problems, as they struggled to develop teaching strategies which would allow them to make fuller use of a more flexible teaching resource such as STAP. Clearly, changing practice (as the large volume of research literature tells us, and this book further testifies) is in any context an extremely complicated affair. Yet for all that, one of the most important findings to emerge consistently from each of the STAP trialling exercises was that all teachers involved had indicated that using the STAP material had promoted a reassessment (to some degree or other) of their current teaching practice.\textsuperscript{43}

Thus, one of the key findings from the project’s work was a growing realisation that a “tight”, carefully thought-through package of curriculum materials, whose development is critically grounded in the classroom practices of teachers, is a powerful tool which can be used in a catalytic way to assist teachers in rethinking and then critically reworking their practice.

The trialling exercise at Yengeni High, involving as it would both a teacher and a researcher intimately familiar with the Programme and its materials, held great promise then of yielding substantial insights into the dynamics of change.

And it is to this that we will now turn …
NOTES

1 The early use of legal mechanisms to control the movement of Africans was given impetus in the 1950s by the Nationalist government policy of apartheid. A set of restrictive laws (which became known as the "pass laws") was the key to the influx control regulations that made criminals out of ordinary Africans who sought jobs in the cities. The enforcement of these regulations hinged upon the requirement to produce a "reference book" or "pass" which would indicate the legal status of the holder. This applied to all Africans over the age of sixteen, who were required to carry a "pass" at all times and to show it to any law enforcement officer on demand.

2 The impact of migration and urban growth is reflected in the rapid growth of African schools in the period after 1986. This is well illustrated by the situation in metropolitan Cape Town where secondary school enrolment increased almost four times in the seven-year period (1987–1994):

<table>
<thead>
<tr>
<th></th>
<th>Primary</th>
<th>Secondary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>38,568</td>
<td>10,202</td>
<td>48,770</td>
</tr>
<tr>
<td>1990</td>
<td>56,905</td>
<td>21,344</td>
<td>78,249</td>
</tr>
<tr>
<td>1991</td>
<td>63,671</td>
<td>26,704</td>
<td>90,375</td>
</tr>
<tr>
<td>1992</td>
<td>67,097</td>
<td>30,427</td>
<td>97,524</td>
</tr>
<tr>
<td>1993</td>
<td>73,368</td>
<td>33,318</td>
<td>106,686</td>
</tr>
<tr>
<td>1994</td>
<td>86,283</td>
<td>38,241</td>
<td>124,524</td>
</tr>
</tbody>
</table>


3 As reflected in a recently published article (Kynoch, 2003), it is a popular perception in the townships that violent crime is on the increase in many areas. [Kynoch, K. (2003). Apartheid nostalgia: Personal security concerns in South African townships. SA Crime Quarterly, 5, September 2003.]

4 Some of the prefabricated buildings are too small to accommodate the 60–70 students who occupy the junior (Grade 8 and 9) classes at the school.

5 The allocation of a second deputy principal is a fairly recent development in township schools.

6 Target student to teacher ratios of 40:1 in all primary schools and 35:1 in all secondary schools were set in 1996 by the national Department of Education.

7 According to Nomzamo, only about half of the Grade 9’s she was teaching had natural science textbooks.

8 This was something of a self-inflicted injury (so to speak) – during an outdoor presentation by the SABC (the national television broadcaster), a group of students clambered up onto the roof of the school building to get a better view of proceedings. The roof collapsed under their weight and it was extremely fortunate that no students were seriously injured. The cost of replacing the roof was eventually shared between the SABC and the education department.

9 Classroom locks and doors are items for which there is a ready market in Kubukene – for use in the building of backyard shacks or dwellings in the informal settlements surrounding the township.

10 As noted before, the education system in this country spans a range of contexts, from well resourced urban to under-resourced rural settings. A significant number of schools in rural areas (particularly in the ex-Bantustans) are in a state of disrepair, and many remain without a supply of electricity or running water.

11 In Chapter 5 we will hear Nomzamo speak longingly of her days as a novice teacher, when she had been able to run a science club which allowed her to engage her students in a variety of extramural activities.

12 One of the enduring legacies of apartheid is the distrust and deep-rooted suspicion with which many black South Africans still view the police force. While in the past black officers were often seen as “sell-outs” and were ostracised as such in their communities, the crisis of legitimacy which they now face seems to have more to do with public perceptions of ineffectiveness and corruption in the face of a growing crime wave.
CHAPTER 2

13 A point made by Fraser et al., (1996).
14 The label of “informal settlement” is applied fairly broadly these days to areas which are usually inhabited by more recent arrivals to the city and describe dwellings which are constructed mainly out of corrugated iron and wood. With the improvement in delivery of basic services, many “shacks” (as they are referred to) are now supplied with both running water and electricity. If there is no outside toilet, then a “night soil” system is usually in operation.
15 Since the dismantling of apartheid, those parents who can afford it have taken to sending their children to schools outside of the townships. Teachers are a case in point, as Nomzamo once remarked (and she is no exception), virtually all her colleagues at Yengeni High send their children to previously white or coloured schools. The student body at Yengeni High is drawn almost exclusively from working-class township families.
16 This is not to say that these children are orphans or were abandoned by their natural parent(s). Some families may have been forced by circumstances (economic or otherwise) to live apart. It is also not uncommon for parents who live in rural areas where there may be limited access to schooling, to send their children to board with family in the urban townships.
17 With Grade 9 being the ninth year of schooling, and children in South Africa in this cohort starting school when they are six years old, one might expect the average age of Nomzamo’s students to be around 14. That it is slightly higher (15 1/2) can be attributed to a number of factors – chief among them being the fact that some students (such as the ten in this class) have by Grade 9 already had to repeat at least one year of schooling. It is also not uncommon for children from poorer families to miss out on one or more years at school (particularly at the junior primary level).
18 The following figure records the attendance of the 9C’s in a number of periods at various times during the trialling exercise:

<table>
<thead>
<tr>
<th>Date</th>
<th>25/3</th>
<th>16/4</th>
<th>20/4</th>
<th>21/4</th>
<th>4/5</th>
<th>13/5</th>
<th>19/5</th>
<th>27/5</th>
<th>28/5</th>
<th>15/6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number present</td>
<td>56</td>
<td>41</td>
<td>69</td>
<td>55</td>
<td>61</td>
<td>62</td>
<td>51</td>
<td>54</td>
<td>53</td>
<td>57</td>
</tr>
<tr>
<td>% Attendance</td>
<td>79</td>
<td>58</td>
<td>97</td>
<td>77</td>
<td>86</td>
<td>87</td>
<td>72</td>
<td>76</td>
<td>75</td>
<td>80</td>
</tr>
</tbody>
</table>

Average attendance: 79% i.e. 56 out of 71 students present. What is more interesting is the range in attendance – from 41 out of 71 (58%) to 69 out of 71 (97%).
19 The impact of this behaviour on teachers is reflected upon in the next chapter.
20 When she experienced problems, it was usually linked to episodes when students had been left teacherless for one or more periods, or when the school itself had sunk into a chaotic state. Section 3.8 in the next chapter is devoted to this issue of teacher attendance.
21 This pattern of attendance was repeated on three other occasions.
22 On three days in the nine-day school timetable, Nomzamo teaches five classes. This means that on these days she could be faced with up to nearly 300 students.
23 We will argue in Chapter 4 that these conditions play a major role in defining the nature of student-teacher interactions in Nomzamo’s classroom.
24 The range in test scores in two of Nomzamo’s general science classes (maximum mark: 50) are tabulated below:

<table>
<thead>
<tr>
<th>Score</th>
<th>0–10</th>
<th>11–15</th>
<th>16–24</th>
<th>25–39</th>
<th>40–50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students 9E</td>
<td>5</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Students 9C</td>
<td>30</td>
<td>11</td>
<td>16</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

Note that 27 of the 40 students in 9E and 57 of 65, almost 90% of the students in 9C, got less than 50% for the test. In 9C, almost half of the 65 students scored 10 or less, and ten students scored less than 5 – a disconcertingly poor performance from a significant number of students in the class. With scores...
between 5 and 43 (in 9E) and between 2 and 38 (in 9C), one can also begin to appreciate the difficulties a teacher faces when attempting to set up tests which are suitable for such a range of student abilities.

The corporal punishment clause was eradicated from education legislation in 1995 and outlawed by The South African Schools Act promulgated in 1998.

Chisholm (1986). Jonathan’s experience of teaching in a similar context to that at Yengeni High is filled with memories of excessive corporal punishment. The practices at rural schools were often far worse than those in the townships, where the systematic beating of large numbers of students (usually girls) was a commonplace occurrence. Transgressions ranged from uniform offences and late coming, to the quality and enthusiasm of their singing at assembly. However unbelievable (and/or exaggerated) it sounds, on occasions the punishment reached such brutal extremes that a student would end up in the local clinic for treatment.

However bizarre this sounds, what Luleka is trying to explain is that the teacher expected his students to copy down his notes in the same cursive style with which he had written them up on the chalkboard. If they failed to do this, then they were punished.

Furthermore, it does seem somewhat ironic that whereas in the past the abuse of corporal punishment by teachers was seen by many students as one of the main reasons for the high matriculation failure rates (Simon and Beard, 1985), today the lack of discipline is viewed by some teachers as the reason why students continue to perform poorly. [Simon, A. and Beard, P. (1985). Perceived reasons for high failure rates of a sample of black matriculation pupils. *South African Journal of Education*, 5(2), 80–82.]

Christie (1998) cites the abolition of corporal punishment as a prime example of unhelpful policy action by the new Education Department. As she points out, while it is in line with principles of human rights, it was introduced in a top-down manner, with no support to already collapsing schools and with no alternatives being suggested. Her finding that this policy had caused a lot of anger in (township) schools, because principals and teachers felt their position had been weakened by the policy and the way it was introduced, no doubt echoes the sentiments of many of Nomzamo’s colleagues at Yengeni High.

For more on the “people development” side of the project’s work, see Gray (1997b, 1999b) and Gray and Ramahlape (1997); and on the overall work of the project, Gray (1999a). (All references to the work of STAP appear for convenience in the main bibliography.)

The National Science Teachers’ Association (NSTA) in the United States has defined STS as the teaching and learning of science in the context of human experience (Yager, 1992). For useful overviews of STS, see:


In suggesting this, we are however mindful of the debates which rage in the literature about the issues of “Science for All” and “scientific literacy”, particularly as they relate to a developing world context such as we have here in South Africa. A useful overview of the literature on scientific literacy is provided by Laugksch (1996). [Laugksch, R.C. (1996). Development of a test for scientific literacy and its application in assessing the scientific literacy of matriculants entering universities and technikons in the Western Cape, South Africa. Unpublished Ph.D. dissertation, University of Cape Town, Cape Town.]

5 A perusal of the STAP booklet will reveal that an attempt has been made to write the text in a style and structure more commonly associated with narrative text, than the stiff and formal prose so common in expository science textbooks.


In this respect, five main questions are being asked: (1) How accessible is the material? A specific research focus is on issues relating to the language and layout of the text, in particular as it relates to the
needs of L2 students (see Clark, 1997). (2) What about flexibility? Are the materials flexible enough
to be used across educational contexts? (3) Is the STAP approach successful in raising the interest and
motivation of students? (and, of course, teachers?). (4) Is it coherent? I.e., does the programme as a
whole provide a clear, logical and sensible treatment of the topic Electricity? (5) Is the programme
viable in terms of teaching time? This is tied to the broader issue of what may be called “usability”

38 A recent paper by Hoban (1997 describes ways in which the regular input of student data about
teaching is used as an integral part of a professional development programme for Australian teachers.
Paper presented at the Annual Conference of the Australian Science Teachers’ Association [ASTA],
University of Melbourne, Australia.] See also: Walsh, M. (1990). What’s your science teacher like?
39 See, for instance, Clark (1993).
40 For examples of students’ comments, the reader is referred to Gray (1997a) and Clark (1997a,
1998).
41 Both seek a shift from teacher-centred to student-centred approaches, which will foster critical
thinking and the development of appropriate skills, by drawing on work which is relevant to students’
lives. Both also emphasize the role which teachers can play in the development of curriculum and
materials.
42 See, for example, Heller, P.M. and Finley, F.N. (1992). Variable uses of alternative conceptions: a
43 The reasons for this reassessment include the following: (1) Trialling the STAP material in schools
with larger subject departments creates the conditions for teachers to work more closely together,
even if it is only for a month or two. The value of creating a more collaborative context cannot be
underestimated, particularly as the majority of teachers are so used to working alone. (2) The STAP
material can be conceptualised as an “active resource” with a potentially high “useability factor”,
which clearly presents a challenge to a teacher’s existing practice. (3) That the students found it a
motivating and stimulating experience learning about electricity in this way is bound to rub off on all
but the most cynical and jaded teacher. Not only that, but teachers indicated that they had come to
realise the extent to which they generally underestimated students at this level (i.e. Grades 8 and 9).
(4) Small-group collaborative work can be done. With the right materials and a rethink of one’s own
practice it is possible to manage and run successful group work (even when faced with large classes).
A sense of starting to get this right can be a really liberating experience for teachers (Clark, 1997b).