SKILLS SHORTAGES IN SOUTH AFRICA

CASE STUDIES OF KEY PROFESSIONS

EDITED BY JOHAN ERASMUS & MIGNONNE BREIER

labour
Department:
Labour
REPUBLIC OF SOUTH AFRICA

HSRC PRESS

Published by HSRC Press
Private Bag X9182, Cape Town, 8000, South Africa
www.hsrcpress.ac.za

First published 2009

ISBN (soft cover) 978-0-7969-2266-3
ISBN (pdf) 978-0-7969-2273-1

Copyedited by Karen Press
Typeset by Simon van Gend
Cover design by Fuel Design
Printed by

Distributed in Africa by Blue Weaver
Tel: +27 (0) 21 701 4477; Fax: +27 (0) 21 701 7302
www.oneworldbooks.com

Distributed in Europe and the United Kingdom by Eurospan Distribution Services (EDS)
Tel: +44 (0) 20 7240 0856; Fax: +44 (0) 20 7379 0609
www.eurospanbookstore.com

Distributed in North America by Independent Publishers Group (IPG)
Call toll-free: (800) 888 4741; Fax: +1 (312) 337 5985
www.ipgbook.com

Contents

List of tables

List of figures

Acronyms and abbreviations

ACTRP	Association of Consulting Town and Regional Planners
ARV	anti-retroviral
Asgisa	Accelerated and Shared Growth Initiative for South Africa
BBBEE	broad-based black economic empowerment
BCM	Business, Commerce and Management
BEE	black economic empowerment
BLA	Black Lawyers Association
CAGR	compound annual growth rate
CEO	chief executive officer
CHE	Council on Higher Education
CIPRO	Companies and Intellectual Property Registration Office
CPAPs	computer professionals and associate professionals
DHA	Department of Home Affairs
DLA	Department of Land Affairs
DoE	Department of Education
DoH	Department of Health
DoJ	Department of Justice and Constitutional Development
DoL	Department of Labour
DPLG	Department of Provincial and Local Government
DPSA	Department of Public Service Administration
DSD	Department of Social Development
ECSA	Engineering Council of South Africa
EGDI	Employment, Growth and Development Initiative
EMIS	Education Management Information System
EN	enrolled nurse
ENA	enrolled nursing auxiliary
ETD	Education, Training and Development
ETDP SETA	Education Training and Development Practices Sector Education and Training Authority
FET	further education and training
GCB	General Council of the Bar of South Africa
GCIM	Global Commission on International Migration
GDP	gross domestic product
GET	General Education and Training
HBU	historically black universities
HEMIS	Higher Education Management Information System
HET	higher education and training
HG	higher grade
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HR	human resources
HSRC	Human Sciences Research Council
HST	Health Systems Trust
HWSETA	Health and Welfare Sector Education and Training Authority
ICT	information and communications technology
IDP	Integrated Development Plan

IPET	Initial Professional Education for Teachers
ISETT SETA	Information Systems, Electronics and Telecommunications Technologies Sector Education and Training Authority
IT	information technology
Jipsa	Joint Initiative on Priority Skills Acquisition
JOI	Job Opportunities Index
LAB	Legal Aid Board
LEAD	Legal Education and Development
LED	local economic development
L-E-R	learner-to-educator ratio
LFS	Labour Force Survey
LGSETA	Local Government Sector Education and Training Authority
LMIS	Labour Market Information and Statistics
LRS	Labour Research Service
LSSA	Law Society of South Africa
MBA	Master of Business Administration
MDB	Municipal Demarcation Board
MEC	Member of the Executive Council [of the provincial government]
MERSETA	Manufacturing, Engineering and Related Services Sector Education and Training Authority
MET	Manufacturing, Engineering and Technology
MOS	Magnitude of Scarcity
MST	mathematics, science and technology
NAAMSA	National Association of Automobile Manufacturers of South Africa
NACOSS	National Coalition of Social Services
NADEL	National Association of Democratic Lawyers
NATED	National Technical Education
NC(V)	National Certificate (Vocational)
ND	National Diploma
NGO	non-governmental organisation
NHR Plan	National Human Resources for Health Planning Framework
NLRD	National Learners' Records Database
NPA	National Prosecuting Authority
NQF	National Qualifications Framework
NRF	National Research Foundation
NSA	National Skills Authority
NSDS	National Skills Development Strategy
OBE	outcomes-based education
OECD	Organisation for Economic Co-operation and Development
OFO	Organising Framework for Occupations
OHS	October Household Survey
PERSAL	Personnel and Salary Information System
PN	professional nurse
REQV	Relative Education Qualification Value
RM	registered midwife
RN	registered nurse
SAACE	South African Association of Consulting Engineers
SACPLAN	South African Council for Planners
SACSSP	South African Council of Social Service Professions
SACTRP	South African Council for Town and Regional Planners
SAICE	South African Institution for Civil Engineering
SANC	South African Nursing Council

SAPI	South African Planning Institute
SAQA	South African Qualifications Authority
SARS	South African Revenue Service
SASCO	South African Standard Classification of Occupations
SASSETA	Safety and Security Sector Education and Training Authority
SET	science, engineering and technology
SETA	Sector Education and Training Authority
SGB	school governing body
SGB	Standards Generating Body
SOE	state-owned enterprise
SSP	Sector Skills Plans
Stats SA	Statistics South Africa
TB	tuberculosis
TIMSS	Third International Mathematics and Science Study
UCT	University of Cape Town
UFS	University of the Free State
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UL	University of Limpopo
UP	University of Pretoria
US	University of Stellenbosch
USA	United States of America
UWC	University of the Western Cape
WHO	World Health Organization
Wits	University of the Witwatersand
WSP	Workplace Skills Plan
WSU	Walter Sisulu University

CHAPTER 1

Introduction

Mignonne Breier

South Africa's skills shortages are widely regarded as key factors preventing the achievement of the country's targeted six per cent growth rate. These shortages, of professionals and artisans in particular, need to be seen in relation to a number of issues that arise from the country's apartheid history as well as post-apartheid attempts to rectify historical imbalances. However, they also need to be considered in relation to international skills shortages and a global market for professional knowledge and skills – what Halvorsen (2005) calls 'knowledge shopping' – in which South African qualifications are highly prized.

The following are some of the major local and international trends as identified in the case studies reported in this monograph.

On the local front, many of the high-level skill shortages in this country are blamed on the education system, which is still struggling to overcome decades of 'neglect and dysfunction' under apartheid (Adler 2002: 7–8), when the education of black people (particularly Africans) was under-funded and of poor quality. There is still a very small pool of matriculants who have the necessary grades and subjects to access programmes like engineering, medicine and accounting. Furthermore, there are particularly few African and coloured students in this pool, and this constitutes a very severe limitation at a time when programmes like these are required to achieve a more representative student population and their professions are required to meet employment equity criteria.

In the artisan trades, the massive shortage of artisans is largely attributed to the decline of the apprenticeship system and the failure of the substitute interventions – training through learnerships and the further education and training (FET) sector – to eliminate the backlog. A particular concern is that an increasing number of young people who have received some form of artisan training do not find jobs after graduation because they have not had sufficient or appropriate work experience.

Another major concern is the loss of senior capacity, largely as a result of affirmative action, which has led to many experienced white professionals leaving their posts and often also the country. The lack of senior capacity is hampering the ability of the workforce to absorb young entrants – one of the reasons for the existence of shortages alongside a pool of unemployed graduates.

Finally, there are shortages that are associated with poor working conditions, particularly in the health sector. Like the education system, the public health sector has been historically under-funded and neglected, with rural facilities most affected. Although there have been many improvements, the conditions in the public sector remain poor in relation to the private sector and the disease burden is high, with the epidemics of HIV, AIDS and tuberculosis not only increasing workloads but also putting at risk the health of health workers. There is widespread internal migration of health professionals from the rural to the urban and

from public to private sectors. Many also emigrate. Although there are few statistics available to quantify our loss, there is sufficient evidence to suggest that nurses leave the country in droves, either permanently or temporarily, largely because they can earn far better salaries overseas. Doctors have attributed their emigration to many different factors, including conditions in the country at large, such as crime.

While locally specific reasons for skills shortages abound, there are also international trends that need to be considered. South Africa is subject to all the pressures of pull and push which characterise the international market for knowledge and skills. This market, one of the many double-edged features of globalisation, offers opportunities for individual travel and advancement, the acquisition and exchange of new knowledge, and valued remittances for some countries that export professionals as a source of national income. On the other hand, the global market also presents severe threats for many developing countries, which are losing the professionals they educate to countries that can pay them more and offer better working and political conditions. The existence of shortages at both ends of the development spectrum contributes to the international pull and push.

Internationally, skills shortages arise from many different factors, ranging from the latter-day lure of 'new' professions/occupations in information and communications technology (ICT), business and finance and the waning popularity of engineering and other 'hands-on' careers to changes in demand (at times of economic growth, for example) and supply (fewer graduates). Many developed countries with aging populations are short of young professionals to maintain their mature economies and care for their sick and elderly. They offer attractive opportunities to professionals from developing countries that provide an acceptable standard of education. The rich recipient country benefits not only from the gain of these professionals but also from not having to meet the cost of their training. In the worst scenarios, the donor country is poor and has many great infrastructural, health and economic needs which are exacerbated by the loss of its professionals. It has to rely on expatriate contractors and international development organisations to meet its skills needs. Thus, international recruitment alleviates shortages (from the perspective of the recipient country) but exacerbates shortages in donor countries, often leading to further disaffection and emigration.

Against this background, it is not surprising that South African professionals with highly marketable qualifications such as engineering, medicine and nursing can easily leave the country if conditions here are not satisfactory. It is also not surprising that there is widespread recruitment of South African professionals by international recruitment agencies, despite some government-to-government agreements that prohibit recruitment by the foreign country's public sector.

At the same time, there are strong pressures locally to import experienced professionals and artisans, particularly in the context of our massive infrastructural growth ahead of the 2010 FIFA World Cup. In the health sector, foreign doctors (mainly from Cuba) are imported in terms of government-to-government agreements to prop up our rural sector. A major difficulty is the lack of consensus about the categories of professionals and trades workers needed and the widely differing numbers on various official lists. These will be discussed in greater detail in the remaining part of this introduction.

Despite the widespread recognition that South Africa has severe skills shortages in certain key sectors, there is still dispute as to the nature and extent – and sometimes even the existence – of these shortages. It is for this reason that the studies reported on in this book were conducted. They explore the question of shortage in 10 different professional/occupational fields in South Africa: management, social work, engineering, medicine (doctors and nurses), law, information and communications technology, schooling, city planning and artisan trades.

Each of the studies is a combination of quantitative and qualitative research. Following a methodology used in the HSRC's professional studies (see Breier 2006), each author made use of a wide range of data sources, including:

- secondary literature about the profession, its education system and issues of supply and demand;
- newspaper reports about the profession in particular, and skills shortages in general;
- interviews with representatives of a selection of enterprises, industries, stakeholder bodies, education and training institutions and professional bodies;
- various sources of quantitative data on the production and employment of professionals or trades workers. These include the October Household Survey (OHS), Labour Force Survey (LFS) and Statistics SA (Stats SA), as well as commercial services that collect employment data and monitor trends, professional associations and councils, the Department of Education's Higher Education Management Information System (HEMIS) database and the South African Qualifications Authority (SAQA) National Learners' Records Database.

The authors also drew on statistics on job vacancies which were captured by the Department of Labour (DoL) during the period March 2004 to April 2007 and analysed in depth by Erasmus (see Chapter 2 of this volume and Erasmus 2008).

This introductory chapter provides background to the studies in this book, before considering some of the key issues that arise out of them. It began by sketching some of the local and international factors contributing to shortages within South Africa and also internationally, and drew attention to the South African political/historical context. Next it will explain the DoL's current system for identifying scarce and critical skills, and indicate which shortages have been officially identified by the DoL (through the Sector Education and Training Authorities (SETAs)) and those which have been specified in the Department of Home Affairs (DHA) quota list for immigration purposes. This is followed by a discussion of methodological concerns which the authors had to address when conducting their research (including difficulties in defining certain professions and the unreliability of official statistics). The rest of the chapter deals with key issues raised by the research. It raises the question of why there are shortages when the country also has a pool of unemployed African graduates, discusses the emphasis which employers place on experience, and quantifies the very small pool of African matriculants who qualify for admission to key professional university programmes. The question of affirmative action in the context of skills shortages is raised. The chapter concludes with a recommendation for further research on critical (generic) skills.

Please note that in this and other chapters, many of the statistics are disaggregated by population group, using the same categories (although differently named) that were used to divide and exclude under apartheid. The criticism could be made that such analyses serve to perpetuate racial divides. However, we believe that we need to continue to make use of these categories in order to monitor progress towards normalisation of the demographic profile of professions and the professional education programmes. We use the terms African, coloured, Indian and white to denote the different population groups, because these are most commonly used in the data sources. Where we wish to refer to all population groups other than white, we use the term 'black'. It should be noted however that the terminology is becoming increasingly problematic as more South Africans, of all races, insert their right to be called 'Africans' and many refuse to classify themselves on a racial basis at all.

The current (DoL) system for identification of skills shortages in South Africa

In the National Skills Development Strategy (NSDS), the DoL commits itself and the SETAs to prioritising and communicating *critical* skills for sustainable growth, development and equity (DoL 2005). Furthermore, it is expected of SETAs to assist workers and the unemployed to enter and complete programmes leading to basic entry-level, intermediate and high-level *scarce* skills.

The DoL (2007: 6) offered the following definitions in its *Framework for Identifying and Monitoring Scarce and Critical Skills*, to direct SETAs in their identification of skills shortages:

> SCARCE SKILLS refer to 'those *occupations* in which there is a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available or (b) because they are available but do not meet employment criteria'.

The DoL says this scarcity can be absolute or relative. Absolute scarcity exists where suitably skilled people are not available. This could be in the case of a new or emerging occupation when there are few, if any, people in the country with the requisite skills (qualification and experience), and education and training providers have yet to develop learning programmes to meet the skills requirements. Alternatively, firms, sectors or even the country as a whole might be unable to implement planned growth strategies and might experience productivity, service delivery and quality problems directly attributable to a lack of skilled people. Another possibility is that there are no people enrolled or engaged in the process of acquiring skills that need to be replaced, meaning that there is replacement demand.

The DoL's definition of absolute scarcity relates closely to what the New Zealand Department of Labour defines as a genuine skills shortage, which occurs when employers have considerable difficulty filling job vacancies simply because of insufficient job-seekers with the required skills (NZ DoL 2006).

Relative scarcity exists where suitably skilled people are available but do not meet other employment criteria. There might be a shortage because of the geographical location of the work available, for example, people might be unwilling to work outside of urban areas. Or there might be equity considerations, in other words, few if any candidates with the requisite skills from specific groups that are available to meet the skills requirements of firms and enterprises. Replacement demand would reflect a relative scarcity if there are people in education and training (formal and workplace training) who are in the process of acquiring the necessary skills (qualification and experience) but where the lead time will mean that they are not available in the short term to meet the replacement demand.

Recruitment and retention difficulties can also contribute to relative scarcity. Employers struggle to recruit and retain workers when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment (NZ DoL 2006). Retention problems are often a major contributor to this condition.

'Critical skills' refer to specific key or generic and 'top-up' skills within an occupation. In the South African context, two groups of critical skills are identified:

1. Key or generic skills, including (in SAQA–NQF terminology) critical cross-field outcomes. These would include cognitive skills (problem-solving, learning-to-learn), language and literacy skills, mathematical skills, ICT skills and skill at working in teams.
2. Particular occupationally specific 'top-up' skills required for performance within that occupation to fill a 'skills gap' that might have arisen as a result of changing technology or new forms of work organisation.

There are two aspects missing from the DoL's definitions which are worth mentioning. The one concerns productivity and the other price. Daniels (2007: 1) has noted that 'for economists the most important aspect of any discussion of skills is its relationship to productivity in the firm. However, Government has defined skills shortage without taking this relationship into account.' Because the domestic literature

also focuses on a non-productivity-related definition of skills shortages, Daniels proceeds with such a definition, while still noting the omission. The same course is followed in this chapter.

Archer (2008) notes that it makes little sense to speak about the shortage of any commodity without reference to its price:

> We cannot identify quantities of skills or occupations as being in excess demand – for instance, a shortage of some specific skill like qualified chartered accountants – nor can we analyse the possible reasons for such a shortage without linking that shortage to its price. The concept must be of a shortage *at a stated level of the wage or salary package payable for a skill of the same type and quality currently being paid*. (Archer 2009: 269)

Erasmus (2008) has also noted that remuneration levels and conditions of employment can contribute to recruitment and retention difficulties and a situation of relative scarcity. As the New Zealand Department of Labour has noted, employers struggle to recruit and retain workers when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment (NZ DoL 2006).

This issue is clearest in the nursing profession, which has traditionally been very lowly paid and is characterised by high attrition and emigration rates (see Wildschut & Mgqolozana, Chapter 7 of this volume). Nurses have recently been granted quite substantial increases in terms of a new Occupation Specific Dispensation, but the effects on retention remain to be seen.

In social work, where salaries have also traditionally been very low, there have been significant changes in patterns of employment following the revision of salaries around 2004. Government salaries are now much higher than those paid by non-governmental organisations (NGOs), compounded by government benefits such as medical aid, pensions, housing subsidies and car allowances. Earle (Chapter 4 of this volume) found that the salary differential had contributed to a massive flow of social workers out of the NGO sector and into the public welfare sector. Nonetheless, like nurses' salaries, social workers' pay continues to be low in relation to the workloads, emotional stress and occupational risks involved.

Our research in the health professions invites one to broaden the concept of price to include the myriad socio-economic factors that make a particular job, in a particular sector, in a particular country, worth its while. Doctors and nurses leave the country not only to earn more but also, in the case of nurses, to achieve greater recognition professionally or, in both cases, to achieve a better quality of life. Crime and the state of our education system are major reasons for emigration, leading to skills shortages back home (see Breier & Wildschut 2006; Breier et al. 2009). Earle (Chapter 4) found working conditions for most social workers to be generally very poor, and also found very high levels of turnover among social workers.

Officially identified shortages

As stated earlier, SETAs are required to identify scarce and critical skills in their Sector Skills Plans (SSPs), and to analyse current and future demand for and supply of skills in their sectors and set out interventions to address these skills shortages.

The DoL uses the data on scarce and critical skills in the SSPs submitted by SETAs to develop a National Scarce Skills List. The DoL has noted, in the list released in 2006, that the aim is 'to provide a more concrete and less anecdotal picture of skills shortages that have been identified as contributing to blocking economic growth and development' (DoL 2006: 1).

The National Scarce Skills List is meant to be used as a basis for the quotas published by the DHA in terms of the Immigration Act (No. 13 of 2002) (DHA 2007), but there are vast discrepancies. Let us take an example from the health sector to illustrate the problem.

The quota list of 2007 mentions only 'research and development pharmacologists' and specifies that 300 are needed. Yet the National Scarce Skills List that informed these quotas (DoL 2006) specifies a total of 25 895 health professionals needed, including 24 716 specified by the Health and Welfare SETA (HWSETA) and the rest by the Agriculture SETA (AgriSETA) and the Local Government SETA (LGSETA). The list includes more than 10 000 registered nurses and more than 4 000 primary health care nurses.

In another example of discrepancy between the two lists, the National Scarce Skills List (DoL 2006) identifies 57 865 managers needed, across various SETAs. However, the immigration quota list (DHA 2007) specifies only 'call/contact centre managers', the category which has the second-highest need according to the list (the quota here is 2 500), second only to 'agricultural science technicians' for which the quota is 5 000.

In general, the National Scarce Skills List of 2006 specifies shortages amounting to 205 370 people, while the subsequent DHA quota list stops at 24 100.

All the professionals/technicians/trades workers specified in the immigration quota list are required to be registered with a relevant professional body and have 'at least five years relevant experience', but the implication is that this experience should be in the field specified, such as civil engineering, and does not have to include managerial or leadership skills.

Erasmus states in Chapter 2 of this volume that there is much concern that SSPs may not be a true reflection of real demand. This could be due to inadequate sources of data, but there is also the fact that there are powerful incentives for false reporting, including the availability of providers and programmes that are already in the system and therefore more accessible. Erasmus then provides a very detailed analysis of the volume of skills shortages listed in the DoL's National Scarce Skills Lists of 2006 and 2007 in relation to the vacancies published in the *Sunday Times* over a period of three years (April 2004–March 2007) and captured by the DoL. Erasmus also provides detailed recommendations designed to improve the collection and analysis of data by the DoL and other relevant agencies, as well as by employers.

Some methodological concerns

In this book, authors attempt to establish the existence, nature and extent of shortages, using multiple sources of data. Their task has not been easy for a number of reasons.

Definitions

Firstly, there were definitional issues. In identifying scarce and critical skills for the SSPs, SETAs are required to make use of the Organising Framework for Occupations (OFO) which was developed by the DoL. The OFO is based on the Standard Classification of Occupations and the DoL claims it is a significant improvement in that it 'provides a skill-based coded classification system, which encompasses all occupations in the South African context. Occupations are classified based on a combination of *skill level* and *skill specialisation* in such a way that it is simpler to locate a specific occupation within the framework and to cross-reference such occupations across economic sectors' (DoL 2006: 1). The OFO has eight major groups: managers, professionals, technicians and trades workers, community workers and personal service workers, clerical and administrative workers, sales workers, machinery opera-

tors, and drivers and elementary occupations. These major groups are divided further into sub-major groups and, beyond that, minor groups and unit groups.

For example, under 'professionals' there are seven sub-groups: arts and media professionals; business, human resource and marketing professionals; design, engineering, science and transport professionals; education professionals; health professionals; ICT professionals; and legal, social and welfare professionals. Under managers, the OFO lists chief executives, general managers and legislators; farm managers; specialist managers; and events, hospitality retail and service managers.

How do you brief a researcher to write a chapter on skills shortages of managers? Mbabane (Chapter 3 in this volume) notes the difficulties:

> The task of defining a manager, as well as the management profession, is made difficult by the wide divergence that exists in types of manager, as well as in their areas of specialisation, levels in the occupational hierarchy, types of qualification, divergent demands of the job, variety of economic sectors in which they play a role, and so on… So the first challenge that one confronts in attempting to define the skills shortage among managers is the basic issue of who or what a manager is.

Later, Mbabane finds variations that 'illustrate the complex interaction between the various "occupations" in the private sector. This makes it difficult, if not meaningless, to draw clear lines between "professionals" and "specialist managers" and between the latter and "chief executives, managing directors and general managers". One "level" or occupation could be a mere "two years' promotion difference" from the other, rather than a matter of "skill".'

Roodt and Paterson, in their study of ICT professionals (Chapter 9), found that a fundamental challenge in estimating the size of the entire ICT workforce was 'how to judge which occupations should or should not be included in the category of ICT workers':

> For instance, in a number of work environments the core functions and activities central to occupational identity (for example, graphic design) have been migrated almost entirely from the traditional analogue environment into a digital workspace. The flexibility and adaptability of ICT supports the continued diffusion of ICT applications into occupational work environments. Rising levels of integration of ICT into the day-to-day work of different occupations and increased intensity of use of ICT tools continue to impact on the question: what is an ICT worker?

In the end, Roodt and Paterson deliberately use a broad generic term – 'ICT worker' – to refer to 'the multiple occupational categories in which people create and produce ICT products and services, or intensively use ICT in the process of fulfilling their particular occupational role'.

Godfrey (Chapter 8) also chooses a broad definition of the legal profession which includes legal advisers as well as those who 'have a legal qualification and the ability to appear on behalf of a client (including the state) in a court or to sit in judgement in a court' (the narrow definition).

Reliability of official statistics

Researchers found large fluctuations in annual figures for the two surveys commonly used to estimate employment: the OHS of 1996–1999 and the LFS of 2000–2005. Both of these surveys are designed and administered by the South African government's national statistics agency, Stats SA. Stats SA ter-

minated the OHS after 1999, replacing it with the LFS. Roodt and Paterson attribute the fluctuations to the process of weighting raw data obtained through a sample to approximate national parameters. Both of the surveys on which this analysis depends – the OHS and the LFS – are based on samples of the national population.

Du Toit and Roodt (Chapter 5) and Roodt and Paterson (Chapter 9) all tried to overcome the problem by calculating an average for the period covered by each survey. Thus, for the OHS which ran for a period of four years from 1996 to 1999, they generated an annual average employment number per occupational group. Similarly, for the six-year period from 2000 to 2005, they created an average employment number. In so doing, they were in a position to establish trends in employment for the 10-year period 1996–2005.

Where statistics were available from Professional Councils, these were used in preference or in addition to the LFS data, but they too have their limitations in that they reflect everyone on the register but not necessarily everyone who is in active employment. Todes (Chapter 12) made use of data from the South African Council of Planners, the South African Planning Institute, the Association of Consulting Town and Regional Planners and a survey of planners in KwaZulu-Natal which showed registration trends, as well as data from the SAQA graduate database, to arrive at a broad estimate of 4 125 planners in 2006 (the figure does not take account of those who have left the country or the profession or retired).

Godfrey was able to supplement data from the OHS and LFS with statistics from the Legal Education and Development section of the Law Society of South Africa, and Mda (Chapter 10) drew on statistics maintained by the Department of Education (DoE).

In general, the research made it clear that one cannot rely on any one source, official or otherwise, to estimate shortages and, even with multiple sources of data, it is very difficult to be categorical in the absence of clearly defined professional or occupational boundaries.

Shortages or not

Most of the chapters in this book identify shortages in the specified field, although they may not always be absolute and may relate to a very specific specialisation within a profession. How does one reconcile these findings with those of other studies which have shown that there is a large pool of qualified, mainly black, people in South Africa who are unemployed?

In his 2008 budget speech the Minister of Labour, Membathisi Mdladlana, quotes research by the Sociology of Work Unit at the University of the Witwatersrand (which was part of the consortium project) as finding that the hierarchy of the national labour market is still very racialised, with black people remaining at the lowest end. He then quotes research by the HSRC which sought to find the reasons for the 'disappearance' of qualified black people, bearing in mind that the Employment Equity Act (No. 55 of 1998):

> …regards a person as suitably qualified for a job as a result of any one, or a combination of that person's –
> - formal qualifications
> - prior learning
> - relevant experience
> - capacity to acquire, within a reasonable time, the ability to do the job. (Mdladlana 2008: 2)

Mdladlana (2008:2) further quotes the HSRC research as finding that 'there is a growing pool of designated groups that on the basis of formal post-school qualifications may be regarded as suitably qualified in terms of the provision of the EE Act'. The research also showed high rates of growth in the supply of black and female (in certain instances) graduates and concluded that there is very little merit in the assertion that qualified black people and women are not 'out there'. Looking beyond formal qualifications, the research also found that 'more than half the sample projected showed potential to advance' (2008: 2). The minister concluded that the findings of the research were not what had been envisaged 10 years before (when employment equity legislation was introduced). 'The carrot is not working and the stick has to come out,' he said (2008:2).

The Chairman of the Employment Equity Commission, Jimmy Manyi, made similar points when he told the parliamentary labour portfolio committee in 2007 that the shortage of skills in South Africa was not as 'chronic' as it was made out to be but had been stated over and over again to such an extent it had become an 'urban legend'.[1] *Business Day* quotes him as saying that the challenge facing South Africa was not so much the shortage of skills but rather the under-utilisation of skilled black people ignored by white-controlled businesses. He suggested that businesses used the excuse of insufficient skills in order to drag their feet on making their workforce racially representative. Black people were 'forever being trained but are never ready to hold on to meaningful jobs', he is quoted as saying. 'Training for blacks is never purposeful.'[2]

Briefing the committee on the commission's 2006/07 employment equity report, Manyi said that transformation in the private sector was painfully slow and called for fines for non-compliance with the Employment Equity Act to be increased dramatically, because at present they were no deterrent. He suggested that consideration be given to a fine similar to that imposed by the Competition Commission – about 10 per cent of annual turnover.[3]

While Manyi's statements led to a barrage of criticism from industry,[4] they were supported by Phumzile Mlambo-Ngcuka, who was not only deputy president of the country but also head of the Joint Initiative on Priority Skills Acquisition (Jipsa) which sees skills shortages as one of the major obstacles to achieving key economic goals. She is quoted as saying: 'There is truth in that article [about Manyi] because blacks don't get experience, and so skills become scarcer, because they are not deployed appropriately in the areas they work in.'[5]

Several research projects have confirmed the existence of a pool of unemployed graduates, many of them African (Moleke 2005a, 2005b; Oosthuizen 2006; Oosthuizen & Bhorat 2005). The main issues identified are the following:

- Graduates in the arts and humanities are less likely to find employment than graduates in other fields. African graduates in the arts and humanities are the least likely to do so.
- Graduates from historically disadvantaged institutions (majority African) have poorer employment prospects than graduates from historically advantaged institutions.

1 Ensor L, SA's skills shortage an urban legend, *Business Day online* 23 May 2007, accessed 6 June 2008, http://www.businessday.co.za
2 Ensor L, SA's skills shortage an urban legend, *Business Day online* 23 May 2007, accessed 6 June 2008, http://www.businessday.co.za
3 Ensor L, SA's skills shortage an urban legend, *Business Day online* 23 May 2007, accessed 6 June 2008, http://www.businessday.co.za
4 SA seeks black talent in wrong places – Manyi, *Business Report online* 29 June 2007, accessed 6 June 2008, http://www.busrep.co.za; Khumalo S & Mope N, Skills shortage is genuine threat to growth, say bosses. *Business Report online* 24 May 2007, accessed 6 June 2008, http://www.busrep.co.za
5 Quintal A, Shortage of skills in SA not chronic, *Pretoria News* 24 May 2007, accessed 28 October 2008, http://www.iol.co.za

- This could be the result of perceptions that the quality of education at these institutions is lower, as well as the fact that they produce more graduates in the humanities and arts.
- Government needs to ensure that the education system produces the mix of skills needed by the labour market.
- Government needs to ensure quality education at all education institutions.

However, Oosthuizen adds that addressing these problems may still be insufficient, as employers may still have misconceptions and stereotypes about certain institutions in terms of educational quality. 'Further investigation of institutions that award non-degree tertiary qualifications may be in order, given the fact that it is particularly graduates of these institutions who are unable to find employment' (Oosthuizen 2006: 58).

It should also be noted that not all historically black universities (HBUs) should be tarred with the same brush. Breier et al. (2006) found relatively high employment rates for students who had graduated from the University of the Western Cape (UWC) or even left the institution without completing their degrees, in relation to other HBUs. This study also noted the very high levels of student poverty at UWC and other HBUs, which often causes students to drop out, although some do return at a later stage.

Godfrey's study of law professionals (Chapter 8) also suggests negative perceptions of the quality of graduates from HBUs. His study found transformation processes, including the introduction of the four-year LLB degree, had increased supply to the profession, although Godfrey qualified this:

> It seems that the quality of graduates is not the same, mainly because of differences in the capacities of universities. Given historical patterns of university attendance, the quality difference assumes a racial guise, that is, historically black universities are producing African LLB graduates who are not as well prepared as graduates from other universities. While demand has been increasing, it appears to be well below supply, which means that legal firms have the luxury of picking articled clerks and admitted attorneys who are perceived to be the best qualified. In other words, African graduates from historically black universities are forming a surplus. Increased supply is therefore not changing the demographics of the profession.

One aspect of the quality of education is the access it affords to necessary work experience. As Mlambo-Ngcuka noted, the unemployment of qualified graduates also has to do with the lack of work experience during their training.

The experience issue

It is important to note that the DoL's definition of scarce skills includes the notion of experience. In the department's terms, scarce skills are 'occupations in which there is a scarcity of qualified and *experienced* people, currently or anticipated in the future, either (a) because such skilled people are not available or (b) because they are available but do not meet employment criteria' (DoL 2006).

The DHA's immigration quota list includes next to every profession or occupation listed the words: 'At least five years experience' (DHA 2007).

Several of the authors in this book write of the demand for experienced, as opposed to merely qualified, professionals or trades workers. The issue is particularly acute in the following fields: engineers, city planners, artisans and ICT professionals.

Todes (Chapter 12) writes that, in general terms, shortages of city planners are at the level of more skilled and experienced people, rather than at entry level, and 'given that black planners have only recently come into the profession, the shortage of black planners at this level is particularly notable'. She says there has been a tendency 'to push graduates into positions well beyond their levels of experience, and given shortages, there is often insufficient mentoring'.

Mukora (Chapter 11) attributes the shortage of artisans in key technical fields at a time of economic growth to the decline in apprenticeship training over the past two decades and insufficient long-term planning by South African employers, who increase their training during boom periods and reduce it during recessionary periods. The recent emphasis on learnerships and FET college training has not resolved the issue. Employers perceive that the young people who go through these programmes are not acquiring the kinds of skills required in industry and so an increasing number of young people are facing unemployment after graduation. The problem, Mukora argues, is that FET colleges are not providing enough access to workplace experience. If the unemployed graduates were put into skills programmes, 'that might go a long way in solving the skills crisis'.

Roodt and Paterson (Chapter 9) find that the dynamics of labour demand and labour supply in the field of ICT are quite complex, and it is therefore difficult to determine whether there is a real ICT shortage or not. Nonetheless, after exhaustive analysis of various sources of data, they come to the conclusion that a shortage will indeed be experienced in future if graduate output does not increase. A greater ICT shortage will be experienced as a result of a demand for IT managers. However, ICT managerial skills 'require not only training, but also experience, which is hard to come by'.

Du Toit and Roodt (Chapter 5) refer to a civil engineering study by Lawless (2005) which found that about 60 per cent of the final year national diploma students who responded to her survey in October and November 2004 had not had experiential training and therefore could not graduate. One of many reasons for this was that employers were not willing to take on employees who might not add immediate value to their organisation. She suggested that the national diploma in civil engineering should be converted to a learnership to ensure that industry is compensated for its involvement in training.

Mbabane (Chapter 3) analyses Commission on Employment Equity reports (2002–2007) and finds that employers were not providing the training necessary to change the racial profile of middle and senior management:

> Most of the training is targeted at the elementary levels, where skills development is least needed, and not so much at professional and middle management levels, which is where the supply of senior managers is likely to come from. This raises concerns that most employers may simply be playing the numbers game, training *en masse* at low levels where there are high volumes and therefore higher skills development levy rebates.

He says this hypothesis is also reinforced by the virtual lack of any movement in the percentage of black people (both male and female) at professional and senior management levels (between 2000 and 2005). In fact, a greater percentage of white men seem to have been appointed to middle management during this period than black people.

> This calls into question the real commitment of the current cadre of corporate leaders to providing equal opportunities to all the citizens of South Africa.

Mbabane says the statistics seem to support the notion that business will only make serious transformational changes if forced to do so by other stakeholders, 'particularly where such stakeholders have serious leverage (such as access to procurement, power to impose fines for non-compliance, capacity for shareholder activism, etc.)'. He concludes:

> In relation to the concerns of this study, the findings on employment practices with respect to the actual skills training, promotion and development of employees are an indictment of employers; it is clear that they are certainly not 'coming to the party' with respect to moving the country away from its past of white privilege, towards a truly non-racial future in which diversity and equity are the rule. This failure also has negative implications for national attempts to develop skills. The statistics seem to corroborate concerns that solutions which focus on the recruitment of foreign skills are sending the wrong signal to employers, namely, that they can continue to disinvest in their own employees and that the solution lies elsewhere.

While the focus of this section has been on the failure of training programmes to provide sufficient work experience or of employers to train appropriately, some say the problem starts at the level of schooling.

The quality-of-schooling issue

Many of the high-level skill shortages in this country are attributed to the fact that there is a very small pool of matriculants who have the necessary grades and types of subject needed to access programmes like engineering, medicine and accounting (usually a minimum of a C grade is required). Furthermore, there are particularly few African and coloured students in this pool and this constitutes a very severe limitation at a time when programmes like these are trying to achieve a more representative student population and their professions are required to meet employment equity criteria. Authors of chapters in this book attribute the shortage of such matriculants to the ongoing poor quality of education in black, particularly African, schools.

Mda (Chapter 10) writes:

> The skills shortage in South Africa is directly related to the quality and quantity of education provided to the majority of South Africans, especially in the past. The shortage reflects the type of education that was made available to the majority, the exclusivity of quality education for a few, and the general lack of access to education for many.

Fourteen years into democracy, there are still big discrepancies in performance in the senior certificate examination between different groups which are usually categorised by race or population group (as defined under apartheid, and still used as a means to monitor equity targets). The following analysis of results follows the traditional categorisations. However, it needs to be pointed out that ideally one needs to consider race in relation to socio-economic status or class. This has historically been indicated by the government department under which a particular school was governed under apartheid (see Reddy 2006a: 49–50, for example) but could also be seen in terms of the quintile system of poverty ranking (as defined by the DoE). Nonetheless, there remains a very close relationship between socio-economic group and race. For example, schools previously governed by the apartheid-era Department of Education and Training and located in poor areas where mostly Africans live, are likely to have learners who are not only mainly African but also mainly in the lowest socio-economic group. It is not surprising, therefore, that these learners under-perform in relation to other groups. Nonetheless, there

are many Africans now attending historically white schools in wealthy areas whose performance is in line with the historically high achievements of such schools.

As noted earlier in this chapter, we analyse data in terms of 'race' (sometimes called population group) following the categorisations that are still used to monitor progress towards equity targets in employment data and in higher education. The DoE does not publish racial breakdowns of matric results, but from figures for 2006 obtained from the department on request, Le Roux and Breier (2007) found that 'the legacy of apartheid, which provided Africans with the cheapest and worst quality schooling, persists'. They found that in 2006, Africans achieved a pass rate in the senior certificate examination of 62 per cent, compared with 81 per cent for coloured learners, 92 per cent for Indian learners and 99 per cent for white learners. Furthermore, African learners formed only 59 per cent of the total that passed with endorsement (that is, gained the appropriate grades and combinations of subjects to qualify for university entrance), against 83 per cent of those that wrote. Indians formed 7 per cent against 2 per cent and whites 26 per cent against 8 per cent, while coloured learners formed the same proportion of passes with endorsement as they did of those that wrote (6 per cent).

Further calculations based on data published by the DoE on its website (DoE 2002, 2003, 2004, 2005a, 2005b, 2006, 2008) show that the overall pool of higher grade (HG) mathematics and physical science passes has increased by around one-quarter in the seven-year period 2000–2006, in comparison with the eight per cent growth in the numbers of candidates for senior certificate overall. In 2000, there were 19 357 HG mathematics passes, and by 2006, this had increased by 5 363 to 25 217. HG physical science passes increased by 24 per cent, from a total of 23 344 in 2000 to 29 781 in 2006.

Bot (2006) provides a racial breakdown of HG mathematics and physical science passes based on further figures obtained from the DoE for the years 2002 and 2005 (Table 1.1). The table shows that although numbers of African and coloured learners who wrote HG mathematics and physical science increased quite substantially between 2002 and 2005, the increases were from a very low base and the percentages who attained these subjects out of the total candidates for the senior certificate were also very low.

Further analysis of the figures reveals large discrepancies in pass rates. In 2005 38.8 per cent of the African learners and 74.0 per cent of the coloured learners who wrote HG maths passed the subject, but the pass rate for Indians was 90.2 per cent and for whites, 94.7 per cent. For HG physical science, 31.9 per cent of the Africans and 71.7 per cent of the coloured learners who wrote the exam passed, compared with 82.2 per cent of Indian and 90.6 per cent of white learners.

Bot does not provide details of grades (symbols) achieved, but the Centre for Development Enterprise (2007: 27) has reported that in 2006, African learners who passed HG mathematics with a C or above amounted to 2 406 (0.5 per cent) of the total number of Africans who wrote the senior certificate examination.

Breier (Chapter 6) says there is no doubt that the immense language barrier faced by most African learners contributes to a great extent to these results, for most have to study in English, which is not their home language, and are taught by teachers for whom English is a second or third language. Furthermore, the majority of schools continue to bear the imprint of apartheid, as a DoE report has indicated (Christie et al. 2007). This report on 'Schools that Work' shows that learners from poor schools that were created in terms of apartheid legislation for Africans, as well as new schools created by the current DoE primarily for Africans, continue to under-perform in relation to schools with different apartheid histories.

TABLE 1.1: *Senior certificate (SC) higher grade mathematics and physical science results, by race, 2002 and 2005*

			Mathematics HG				Physical Science HG			
Year	Race	Total SC candidates	Total who wrote		Total who passed		Total who wrote		Total who passed	
		N	N	%	N	%*	N	%	N	%*
2002	African	349 725	16 818	4.8	4 637	1.3	30 156	8.6	7 129	2.0
	Coloured	32 669	1 511	4.6	1 067	3.3	1 731	5.3	1 251	3.8
	Indian	15 173	4 218	27.8	3 035	20.0	5 157	34.0	3 709	24.5
	White	49 304	12 663	25.8	11 026	22.5	13 521	27.5	11 304	23.0
	Unknown	966	68	7.0	33	3.4	131	13.6	41	4.2
	Total	447 837	35 278	7.9	19 798	4.4	50 696	11.3	23 434	5.2
2005	African	408 782	25 500	6.2	9 894	2.4	42 070	10.3	13 424	3.3
	Coloured	32 115	2 005	6.2	1 484	4.6	2 070	6.4	1 485	4.6
	Indian	14 563	3 764	25.8	3 395	23.3	4 507	30.9	3 705	25.4
	White	44 582	11 917	26.7	11 286	25.3	12 081	27.1	10 940	24.5
	Unknown	9 110	156	1.7	133	1.5	179	2.0	140	1.5
	Total	509 152	43 342	8.5	26 192	5.1	60 907	12.0	29 694	5.8

Source: Bot 2006

Note: * Percentage of total SC candidates

The authors suggest that these trends are not only reminders of the differential resourcing of schools under apartheid, when African schools were most poorly funded, but also indicate the possibility that the organisational patterns and cultures which prevailed in the past are continuing to do so.

Whatever the reasons, the trends in matriculation results mean that in the drive for transformation, university programmes like engineering, medicine and accounting that require at least a C-symbol pass on HG mathematics have been competing for fewer than 2 500 African matriculants.

Although this is a major constraint, some institutions have attempted to overcome the limitations by introducing differential admission criteria, in order to make it possible for students from disadvantaged backgrounds who show potential to join the MBChB programme even if they do not have a C pass. At the University of Cape Town (UCT), all MBChB students start off at the same point, but if they fail the first semester they are put onto an intervention programme. By their third year, according to a senior professor, one cannot distinguish students from an advantaged or disadvantaged background. In 2003, the student who achieved the top honours came from a rural KwaZulu-Natal background and had started off in an academic support programme (Breier & Wildschut 2006). Reddy (2006b) suggests a number of strategies to help improve mathematics and physical science results, particularly in African schools. These include interventions for improvement at all levels of schooling, not only secondary level, and investment in African schools that show potential to succeed.

In the meantime, programmes that require HG mathematics and physical science are going to struggle to meet the demands of the economy, let alone equity criteria. Jipsa has calculated that to meet the projected demand in a context of massive infrastructural growth (which for 2007–2009 alone amounts to R400 billion), the production of engineering graduates must increase from 1 400 per year to 2 400 per year. In 2006, the Department of Health was wanting to increase the annual production of medical graduates from approximately 1 200 per year to 2 400 per year by 2014, due to 'significant shortages and extreme mobility of medical doctors' (DoH 2006, cited in Breier, Chapter 6).

It is clear from analyses presented earlier in this chapter that these goals will not be met without substantial improvements in matriculation results; and even if they were to improve, it would be some time before the improved results could translate into sufficient graduates and beyond that, professionals experienced enough to perform high-level functions. The Engineering Council of South Africa believes it takes about 10 to 11 years to educate and train an engineer, starting in Grade 9 with good mathematics and physical science education at secondary school level and ending when the 3 years of workplace experience has been completed. The same principle is valid for engineering technologists and technicians (Du Toit & Roodt, Chapter 5).

It is in this context that many employers are seeking to import skilled professionals and trades workers (as evidenced by the immigration quota list). It is also in this context that the question of a moratorium on affirmative action has been raised, particularly in the engineering profession. This will be discussed in detail in the following section.

Shortages and employment equity

Affirmative action in South Africa has never been without criticism, particularly from whites who stand to lose by it. The debate has acquired a new hue and greater urgency in the context of major skills shortages, particularly in engineering, where the shortages are so great that they dominate the official lists of scarce skills. The National Scarce Skills List for 2007 lists a shortage of 10 705 engineers and technologists, 9 830 engineering technicians and draftspersons and 23 455 fabrication[6] and mechanical[7] engineering trades workers (DoL 2007). The Immigration Quota List for 2008 provides for the importation of 4 150 'manufacturing and construction'[8] engineers, 5 250 building and engineering technicians and 5 800 fabrications and mechanical engineering trades workers (DHA 2008).

Du Toit and Roodt argue in Chapter 5 that migration of white engineering professionals out of the state and parastatal sectors due to transformation policies is frequently given as a reason for the engineering skills shortages. Their figures show a decline in numbers of engineers and technologists in the 2004/05 period (27 764) compared with the 2002/03 period (28 606), with the proportion of whites in this category dropping from 76.9 per cent over the 1996–1999 period to 63.2 per cent over the 2000–2005 period. These declines need to be seen in relation to the shortage of older engineers and technologists. In 2005, only 13 per cent of all engineers and technologists were between the ages of 40 and 49. This is the age group of the mid-career professional who, having gained experience, is highly sought-after globally. Furthermore, only 13 per cent were in the age categories 50–60+. Du Toit and Roodt report that the low numbers of engineers in these age groups have a major impact on the transfer of skills to younger engineers and technologists. One of the key issues in the engineering

6 Fabrications engineering trades workers include boilermakers, welders and sheet metal workers.
7 Mechanical engineering trades workers include metal fitters and machinists, fitters and turners, precision metal trades workers, toolmakers, millwrights and mechatronics trades workers.
8 Manufacturing and construction engineers include the following types of engineers: chemical and materials, civil, structural, aeronautical, aircraft maintenance, avionics, electrical and electronic, industrial, mechanical and mining.

industry at the moment is the lack of mentors, and there is a drive to re-employ retired engineers to address this need (Jipsa 2007).

The low number of senior engineers is of even greater concern when one considers that there has been only a marginal increase in the number of engineers graduating from universities and technologists and technicians graduating from universities of technology over the 1996–2005 period – an annual average growth rate of 2.3 per cent.

A moratorium on affirmative action?

The figures and statements reported in Du Toit and Roodt's study support the widespread contention that transformation policies are exacerbating skills shortages in engineering.

In 2007, an ANC provincial executive member and MEC for Transport and Public Works, Marius Fransman, appealed for a mature and thorough debate on a moratorium on affirmative action, in the light of the shortage of engineers. Fransman said, in an article published online in March 2007 in the ANC newsletter *Umrabulo*, that the 'shortage of engineers will be exacerbated by the major infrastructure spending allocated by treasury' (Fransman 2007). This spending amounted to 'R370bn over the next three years, with 50% to be spent by the three spheres of government and 40% by the state owned enterprises and 10% through public-private partnerships and development institutions – as well as the major infrastructure projects like the Gautrain and at least five major soccer stadiums for the 2010 World Cup'.

Fransman said that the shortage of civil engineers was the most acute of all the shortages of engineering and built environment professionals:

> Last year only 10% of the demand for these professionals was met, and within current supply constraints matters will not improve much by 2010 (when only 15% of the demand will be met). (Fransman 2007)

He proposed a debate on a possible moratorium on employment equity:

> One of the unintended consequences of employment equity is the 'leakage' from the economy of white graduates with scarce skills. While employment equity is a strategy to redress historical imbalances, our country cannot afford to lose too many engineers. The question of a possible moratorium on employment equity needs to be thoroughly and maturely debated, based on research into the loss of scarce skills professionals within the context of 'binding constraints' on economic growth and the consequent lack of delivery to the poor. The existence of a 'second economy trap' is arguably the most important historical imbalance that needs to be redressed in South Africa currently.

Not surprisingly, Fransman's remarks were taken up by opposition parties which subsequently called for a complete moratorium on affirmative action.[9] However, various government ministers, including the Minister of Finance, Trevor Manuel, the Deputy President, Phumzile Mlambo-Ngcuka, and the Minister of Labour, Membathisi Mdladlana, denied the possibility of this happening.

9 Parties call for cap on AA, *SAPA* 1 March 2007

Manuel is quoted as saying in Parliament: 'It [the Employment Equity Act] is there. In its practice, it is frequently very poorly used. It is sadly abused, but it is there and the intent of the Act is abundantly clear.'[10] The deputy president is quoted as saying that affirmative action is here to stay, at least until the imbalances of the past are redressed. She is said to have argued that it should be called 'corrective action' and that there were still too many formerly disadvantaged people, especially women and disabled people, who had not benefited form the government's employment equity policy.[11] The minister of labour is reported to have labelled Fransman 'a dreamer' for calling for a moratorium on affirmative action, adding that he must ask the ANC for a mandate.[12]

Fransman's appeal has been supported, however, by Dr Mamphela Ramphele, former vice-chancellor of UCT and former managing director of the World Bank (Ramphele 2008). Speaking at an award ceremony of Masakh'iSizwe Centre of Excellence, which awards bursaries to students in the engineering and built environment fields and also has an engineering skills development programme aimed at producing 'engineers with a social conscience', she referred to Fransman's suggestion and said the reaction from some cabinet ministers was to 'shut down the debate' (Ramphele 2008: 9). She said she was concerned that employment equity was being treated as a 'holy cow':

> Given the many concerns expressed across the board, and the tough global skills market it is surprising we are not examining the impact of employment equity on our performance as a nation. Are we as much in denial about this as we were about AIDS and Zimbabwe? Why are we not debating this issue in a mature and considered manner? (2008: 9)

Ramphele further said the government needed to acknowledge that mistakes were being made in the implementation of employment equity. These were exacerbating the problem of skills shortages, she said:

> Affirmative Action if understood to be '*regstellende aksie*' is intended to give a leg up to those with potential to succeed who have been hobbled by apartheid. It does not mean putting an unskilled or inexperienced person in a position in which performance is impossible.

Ramphele said Masakh'iSizwe was trying to build an ethos of non-racialism in its students, but what would these students – of all colours – feel when government 'prioritises employment equity targets as a factor in its appointment processes at the expense of competence?'

One of the effects of affirmative action has been the depletion of senior professionals and trades workers who might be able to mentor newcomers. Any new graduate needs induction into the workplace, but the need is particularly great for those who gained little or no work experience in the course of their training. (As Mukora notes in Chapter 11, this is increasingly the case among FET college and learnership diplomates.) The demands for production within tight deadlines make it difficult for the existing professionals and skilled trades workers to provide the kind of mentoring that new graduates/diplomates need, and there are some who might fear they are training themselves out of a job if they do so. Lawless (2005: 251) has suggested that employment equity policies need to be reviewed, particularly in departments which are critically short of engineering staff, and senior staff should be retained post-retirement age to initiate and manage projects and train young graduates.

10 Quintal A & Webb B, Manuel stands firm in equity debate, *Cape Times* 2 March 2007
11 Webb B, No stopping affirmative action yet, *Pretoria News* 7 March 2007
12 Ngalwa S, MPs at crossroads over affirmative action, *Cape Argus* 16 May 2007

Jipsa (2007, 2008) has also appealed for the deployment of retired professionals and shown the important role which they can play in local municipalities, particularly in the poorest communities, which lack the core skills required to run an effective municipality and do not have capacity in engineering, finance and town planning. Jipsa says the lack of these high-level skills has impacted on the delivery of water, sanitation and infrastructure. The Siyenza Manje Initiative, which recruits qualified retired experts, pairs them with young graduates who can be mentored and deploys them to local municipalities that require assistance.

One of the problematic consequences of the precipitous departure of senior professionals is that the workplace skills which can only be acquired and transferred tacitly are lost to the workplace. These are some of the skills which the DoL has labelled 'critical'. They are also known as generic skills or, in SAQA parlance, 'critical cross-field outcomes'.

Critical skills

It is a limitation of the chapters in this book that they do not tackle the issue of critical skills head-on. Taking their cue from the SSPs, and the DoL and DHA lists, they concentrate rather on scarce skills and the references to generic competences are rather oblique. However, there are some references to critical skills. Todes (Chapter 12) talks of the need for 'a good understanding of the space economy and an ability to think in spatial terms' as well as decision-making skills, among others. Mda (Chapter 10) writes of teachers needing upgrading in language skills, literacy, numeracy and computing skills as well as in skills to develop terms of reference, to lead and manage processes, to be 'mediators of the curriculum' and to teach 'diverse' learners in classes with different races, ethnicities and language groups. Godfrey (Chapter 8) speaks about the need for improved numeracy and literacy abilities of LLB graduates. Wildschut and Mgqolozana (Chapter 7) emphasise critical thinking skills that enable nurses to innovate in the context of resource-constrained environments.

If this research project has not been able to focus on critical skills, then they still need to be addressed elsewhere. There are important questions to be answered that have bearing on the future employability of graduates. Are educational institutions providing students with the critical (generic) skills that are needed to cope in the workplace? If so, what are they doing and what do employers think of what they are doing? If not, why not?

There is much debate in the educational literature as to whether a formal academic programme can ever fully induct a student into the demands of a workplace, but there is no doubt that experiential learning of some kind is essential (see Breier 1998). The research reported on in this book suggests that it is the experiential opportunities that a training programme provides that often make the difference between employment and unemployment for the new graduate.

Literature on workplace education recognises that a great deal of knowledge in a workplace is tacitly acquired and transmitted, and is stored in the heads – and hands – of experienced individuals. Leonard and Swap (2005) speak of 'experience-based wisdom' or 'deep smarts' that can only be transmitted through coaching or guided experience. If senior staff retire without transferring such wisdom to others, then it is lost forever, they say. Although this issue is internationally recognised, it is particularly pertinent in South Africa where, in the context of employment equity, many experienced white personnel have ended their careers abruptly through early retirement or retrenchment. Those who remain might be unwilling to part with their knowledge lest they find they are training themselves out of a job. In the absence of policies that acknowledge the importance of the mentoring role, newcomers are left to 'sink or swim' or 'figure it out', often without success.

Conclusion

This introductory chapter has attempted to sketch the background against which the various studies in this book should be viewed. This background includes both the local and international contexts.

The studies reported on in this book show the complexity of the concept of skills shortage and the difficulties associated with trying to quantify shortages. In terms of DoL policy, shortages can be absolute or relative and they can pertain to scarce or critical skills. 'Scarce' refers to occupations that are in short supply, while 'critical' covers both generic skills and specific occupational skills. Scarcity is not defined in relation to productivity and price, although there are some who believe it should be.

SETAs are required to use the concepts of scarce and critical skills and the definitions of occupations and professions which are contained in the OFO to identify shortages for a National Scarce Skills List. This list is meant to inform the DHA immigration quota list, although there is considerable discrepancy between the two.

In trying to reach their own assessments of shortages, the authors of the studies reported on in this book have made use of multiple sources of data in order to overcome the limitations of official statistics which proved to fluctuate wildly (in the case of the LFS and OHS). All the studies found evidence of some type of shortage, but not all shortages have been given equal priority by the DoL and Jipsa. Professions/occupations that are widely recognised as having shortages are those that are directly affected by the extensive growth in infrastructure development which the government has embarked upon and the many deadlines associated with preparations for the 2010 FIFA World Cup. In this context, there is urgent need for more engineers, town planners and artisans. The immigration quota list for 2008 allows for the importation of 5 950 trades workers of various kinds, 4 150 'manufacturing and construction' engineers and 5 250 'building and engineering technicians'. Although the list does not specify town planners, the shortages in this field have been recognised by Jipsa. It is also widely recognised that the country lacks the science and mathematics matriculants who would qualify for admission to programmes like engineering or to train as mathematics and science teachers. For this reason, it is not surprising that the immigration quota list includes 4 000 mathematics, science and design and technology teachers (DHA 2008).

But there are also fields which have not been officially prioritised for immigration purposes, which are equally short of professionals. Breier (Chapter 6) has written of the extreme shortage of doctors in the public sector and in rural areas, which has already led the government to import doctors from Cuba. Wildschut and Mgqolozana's figures (Chapter 7) show an alarming gap between the number of nurses who graduate each year and growth in the profession itself. Furthermore, nearly two-thirds of nurses are over the age of 40, signalling an impending crisis if the numbers of newcomers are not increased.

A distressing feature of the South African labour market, which is highlighted in this book, is the fact that skills shortages exist alongside a large pool of unemployed graduates. This pool has been identified in several research studies and found to have the following features: the graduates are mainly African, they tend to come from HBUs, and they tend to have graduated in the arts and humanities. There are also many unemployed young people who have completed courses in technical fields but are unable to qualify because they have not been able to find work placements. There are others who have completed FET or learnership qualifications but are unemployed because employers do not perceive them to have the skills which they require. The existence of this pool of unemployed young people points to the disjuncture between higher education and the workplace generally, but also to the quality of higher education programmes at some institutions.

The combination of massive demand for skilled expertise and unemployed people who are qualified, but lack experience, has led to new perspectives on the question of affirmative action, which have been recounted in this chapter. Whether we achieve our plans for infrastructural development, including the deadlines of 2010, it is argued, depends on the availability of sufficient experienced professionals and artisans. The immigration quotas which have been granted in these categories suggest that racial equity considerations have been set aside in this regard. At the same time, we also need senior personnel who are able to mentor newcomers, particularly if they have not had satisfactory work experience while training. It is in this context that there have been appeals for retired (inevitably white) personnel to return to the country and the workplace to help initiate and manage projects and mentor newcomers. It is in this context, too, that the debates on a possible moratorium on affirmative action in key sectors have acquired new momentum. The research reported on in this book suggests that if we do not review our policies of affirmative action, particularly in the engineering sector, then we might end up with a permanent reliance on foreign skills, while our own graduates, many of them African, remain un- or under-employed.

Structure of the book

The book begins with an attempt to verify, in general terms, the skills shortages that have been officially identified (Chapter 2). Subsequent chapters deal with scarcities of managers, social workers, engineers, doctors, nurses, law professionals, ICT professionals, school teachers, artisans and town planners. Each chapter is based on research that followed a similar methodology. For this reason, the reader will find some repetition across the various studies, in terms of questions asked, sources of information and definitions used. This repetition has not been edited out because it is necessary for each chapter to stand alone. In this way, it can be of service to those whose interest is confined to the profession concerned, while also making a contribution to the broad picture which the chapters collectively provide.

References

Adler J (2002) Global and local challenges of teacher development. In J Adler and Y Reed (eds) *Challenges of teacher development: An investigation of take-up in South Africa*. Pretoria: Van Schaik

Archer S (2009) Growth and skills issues in the financial services sector of the South African economy. In A Kraak (ed.) *Sectors and skills: The need for policy alignment*. Cape Town: HSRC Press

Bot M (2006) Output from the schooling system: Focus on senior certificate examination results, 1996–2005. Unpublished paper commissioned by the HSRC for the Department of Labour project

Breier M (1998) The role of the generic skill in lifelong learning: Panacea or pipedream? *Journal of Education* 23: 73–100

Breier M (2006) A model for the analysis of professions and professional education applied to medical doctors in South Africa. *Perspectives in Education* 24(3): 25–35

Breier M, Letseka M & Visser M (2006) Student retention and graduate destination. Report on case study on UWC for the Student Pathways Project, HSRC

Breier M & Wildschut A (2006) *Doctors in a divided society: The profession and education of medical practitioners in South Africa*. Cape Town: HSRC Press

Breier M, Wildschut A & Mgqolozana T (2009) *Nursing in a new era: The profession and education of nurses in South Africa*. Cape Town: HSRC Press

Centre for Development Enterprise (2007) *Doubling for growth*. CDE Research 15. Johannesburg: Centre for Development Enterprise

Christie P, Butler D & Potterton M (2007) *Schools that work*. Report of Ministerial Committee. Accessed16 April 2008, http://www.education.gov.za

Daniels R (2007) *Skills shortages in South Africa: A literature review*. Development Policy Research Unit Working Paper 07/121. Cape Town: Development Policy Research Unit, University of Cape Town

DHA (Department of Home Affairs, South Africa) (2007) Specific professional or occupational classes. *Government Gazette* 29826 (Government Notice 362). Pretoria: DHA

DHA (2008) Specific professional categories and specific occupational classes. *Government Gazette* 30975 (Government Notice 412). Pretoria: DHA

DoE (Department of Education, South Africa) (2002) *Education statistics in South Africa at a glance 2000*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2003) *Education statistics in South Africa at a glance 2001*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2004) *Education statistics in South Africa at a glance 2002*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2005a) *Education statistics in South Africa at a glance 2003*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2005b) *Education statistics in South Africa at a glance 2004*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2006) *Education statistics in South Africa at a glance 2005*. Accessed 5 July 2008, http://www.education.gov.za

DoE (2008) *Education statistics in South Africa at a glance 2006*. Accessed 5 July 2008, http://www.education.gov.za

DoL (Department of Labour South Africa)(2005) *National skills development strategy*. Accessed 4 July 2008, http://www.labour.gov.za

DoL (2006) *National scarce skills list (Asgisa aligned)*. Accessed 4 July 2008, http://www.labour.gov.za

DoL (2007) *Framework for identifying and monitoring scarce and critical skills*. Final draft. Accessed 4 July 2008, http://www.labour.gov.za

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

Fransman M (2007) Patriotic engineers for 2010 and beyond. *Umrabulo* 28. Accessed 30 June 2008, http://www.anc.org.za/ancdocs/pubs/umrabulo/umrabulo28/art4.html

Halvorsen (2005) Identity formation or knowledge shopping in times of globalisation. In T Halvorsen, G Mathiesen and T Skauge (eds) *Identity formation or knowledge shopping: Education and research in the new globality*. Bergen, Norway: Norwegian Centre for International Cooperation in Higher Education (SIU)

Jipsa (Joint Initiative on Priority Skills Acquisition) (2007) *Report on activities March to December 2006*. Accessed 4 July 2008, http://www.Jipsa.org.za

Jipsa (2008) *Report on activities in 2007*. Accessed 4 July 2008, http://www.Jipsa.org.za

Lawless A (2005) *Numbers and needs: Addressing imbalances in the civil engineering profession*. Pretoria: South African Institute of Civil Engineering

Leonard D & Swap W (2005) Deep smarts: Experience-based wisdom. Presentation for the Executive Forum. Accessed 4 July 2008, http://www.executiveforum.com/PDFs/EFLeonardSwapSynopsis.pdf

Le Roux P & Breier M (2007) Steering from a distance: Funding mechanisms and student access and success in higher education. Paper delivered at first annual SANORD Conference, Bellville, 5 December

Mdladlana M (2008) Budget vote speech: Celebrating ten years – the fruits of our labour. Speech delivered to Parliament, Cape Town, 15 May 2008. Accessed 6 July 2008, http://www.polity.org.za/article.php?a_id=133485

Moleke P (2005a) *Finding work: Employment experiences of South African graduates*. Cape Town: HSRC Press

Moleke P (2005b) *Inequalities in higher education and the structure of the labour market*. Cape Town: HSRC Press

NZ DoL (New Zealand Department of Labour) (2006) *Occupations in shortage in New Zealand: 2006*. Accessed 14 November 2007, http://www.dol.govt.nz/PDFs/sera-key-findings.pdf

Oosthuizen M (2006) *The post-apartheid labour market*. Development Policy Research Unit Working Paper 06/103. Cape Town: Development Policy Research Unit, University of Cape Town

Oosthuizen M & Bhorat H (2005) *The post-apartheid south african labour market*. Working Paper 9630. Cape Town: Development Policy Research Unit, University of Cape Town

Ramphele M (2008) Mzigisi a ka na shwa: Kodumela moepathutse ga go lehumo le letswang kgauswi. Speech delivered at the Masakh'iSizwe Centre of Excellence Bursary Awards Ceremony, Cape Town, 21 February

Reddy V (2006a) The state of mathematics and science education: Schools are not equal. In S Buhlungu, J Daniel, R Southall & J Lutchman (eds) *State of the nation: South Africa 2005–2006*. Cape Town: HSRC Press

Reddy V (2006b) *Mathematics and science achievement at South African schools in TIMSS 2003*. Cape Town: HSRC Press

CHAPTER 2

The identification of scarce and critical skills in the South African labour market

Johan Erasmus

Background to the study

The South African government aims to achieve an economic growth rate of six per cent per annum; it believes that this rate of growth will lead to a reduction in unemployment and ultimately to a better quality of life for all. A shortage of skills is viewed as a key obstacle to achieving a six per cent growth rate.

A range of sources are signalling scarcity of qualified and experienced people in occupations which are portrayed as crucial to helping the economy grow and/or creating job opportunities at a higher rate. However, some of the messages regarding scarce skills are open to doubt on methodological grounds. Furthermore, the reasons given for perceived skills shortages are not always clear or widely communicated. They might refer to immediate skills needs (that is, skills needed to support the Accelerated and Shared Growth Initiative for South Africa (Asgisa)) or current education and training pipeline blockages (such as the low mathematics and science output from schools), or they could concern perceived future skills needs in terms of demographic, technological and global changes or the long-term growth and development strategy for South Africa. An understanding of the reasons for perceived skills shortages will help to determine the appropriate measures needed to alleviate these shortages.

This chapter presents a three-fold analysis of skills shortages in South Africa. First, it discusses the current system for the identification of skills shortages in South Africa. It then presents a framework for the identification and verification of shortages and the development of lists of shortages. In the third part of the discussion, it attempts to verify identified shortages through an analysis of vacancy rates. The chapter ends with recommendations designed to improve future analyses of vacancy rates and the collection and centralisation of data by the Department of Labour (DoL).

The current system for identification of skills shortages in South Africa

In terms of the National Skills Development Strategy, Sector Education and Training Authorities (SETAs) are required to identify scarce skills in the research, development and submission of their Sector Skills Plans (SSPs). SETAs are also expected to assist workers and the unemployed to enter and complete programmes leading to basic entry-level, intermediate and high-level *scarce* skills.

SETAs are regarded as critical intermediaries in the relationship between training (supply-side) and economic and social requirements (demand-side). They are required to identify employment and

growth trends and the current and future skills requirements of the relevant sectors, and to prioritise these in terms of skills development in their SSPs. The skills plans must provide a sector profile, an analysis of the demand for skills in the sector, and an analysis of the supply of skills to the sector. The plans must also analyse the implications of this information for skills needs in the sector, reflect any additional research needed to establish skills needs, and include a scarce and critical skills list. The DoL uses these data to develop a National Scarce Skills List for South Africa.

As noted in Chapter 1 of this volume, in terms of DoL definitions, 'scarce skills' refers to those *occupations* in which there is a scarcity of qualified and experienced people – current or anticipated. The term 'critical skills' 'refers to a particular skill within an occupation' (DoL 2005: 21).

SETAs are expected to prioritise the employment and growth trends they identify, as well as the current and future skills requirements of the relevant sectors, in terms of skills development in their SSPs. This should be done through a process of 'labour market analysis which entails a…regular analysis of…the best information available regarding the state of the labour market and the economy…rather than extracting data from econometric or statistical models equated to manpower planning' (DoL 2007a: 23).

However, several reviewers of SETA SSPs are concerned that these SSPs may not be a true reflection of real demand, for a number of reasons (Elliot 2007; Singizi 2007; Wilson et al. 2004). First, there is a tendency to use information from Workplace Skills Plans (WSPs) and Annual Training Reports (ATRs) in order to merely corroborate claims of scarcity. Second, it has been found that system incentives and feedback loops potentially encourage false reporting at both the enterprise and SETA levels. SETAs may emphasise specific skills as scarce skills because they are able to meet targets with the help of providers and programmes that are already in the system and therefore more accessible. Individual enterprises may be encouraged to report any area in which they wish to train as scarce, in reaction to the national emphasis on scarce skills, investment and the use of sector discretionary funds for the development of scarce skills. Third, South African employers' approach to human resource development has not always been strategic and is rather narrowly focused. Fourth, SETAs experience difficulty in indicating critical skills against a specialisation identified as scarce, and there is confusion as to whether a skill is scarce or critical, or both. In some instances, scarcity is indicated in occupations where large numbers of people are available (for example, educators or small-scale emerging farmers) but the anomalies are not explained. In other instances, it is not clear if proper provision was made for replacement demand (that is, the fact that it takes several years to develop managerial skills, or to train and develop qualified engineers, for example). This leads to ill-advised identification of interventions to address skills shortages, (such as recommended interventions to address shortages of specialist managers pitched at National Qualifications Framework (NQF) Level 1. Finally, at the heart of the weaknesses in the planning system lies the lack of reliable quantitative labour market and employer-level data, which makes it virtually impossible to make quantitative estimates of the demand for certain skills.

Despite these concerns, SETAs are regarded as critical intermediaries in the relationship between training (supply-side) and economic and social requirements (demand-side). SETAs are expected to play a vital role in clarifying skills requirements in the context of past, current and future economic demand. In fact, there will be an increased demand for SETAs to 'play a more direct role in providing sector foresight studies and labour market analysis' in the efforts of the Department of Education (DoE) and the DoL to enhance the efficiency of the NQF (DoE & DoL 2007: 12).

Because the capacity of the SETAs in regard to capture and management of data and sectoral and occupational modelling is seriously lacking, SSP reviewers highlight the value of a centralised system for the collection and analysis of labour market information and the importance of a clear and

standardised understanding of 'scarce skills'. In terms of the proposed Skills Development Amendment Bill,[1] the DoL plans to establish a Skills Development Planning Unit whose function will be to research and analyse the labour market, in order to determine skills development needs for South Africa as a whole as well as for each sector of the economy and the organs of the state.

A framework for the identification and verification of skills shortages

In the following analysis of skills shortages in South Africa, a set of indicators suggested by Infometrics Ltd (2006: 19–20) is used to develop a framework to standardise the assessment of skill shortages and to guide decisions as to which information should or can be collected or developed centrally. The framework depicted in Figure 2.1 builds on these indicators to describe the sequential activities needed to establish whether any skills shortages exist, to verify identified skills shortages, and to develop a final list of skills shortages. The framework specifies seven key steps, as well as sub-tasks, and also identifies potential sources of information. The key steps are grouped as follows:

Identify possible skills shortages

1 Conduct vacancy counts/monitor the relative volume of vacancies.
2 Determine vacancy fill rates.
3 Assess wage fluctuation.

Verify the identified skills shortages

4 Assess the occupation's exposure to product and labour market competition.
5 Find evidence that the current demand for the skills will be sustained.
6 Assess the length of time the education system may take to address and remedy identified skills shortages.

Develop a final list of skills shortages

7 Find evidence on the degree of specialisation in different occupations.

In the following sections of this chapter, each of these points will be discussed in turn in relation to South Africa's situation. It should be noted that the first three indicators (vacancy rates, fill rates and wage fluctuation) are considered the most important means to identify skills shortages. As the discussion will show, South Africa does have the necessary information sources to monitor many occupations on an ongoing basis with regard to these indicators.

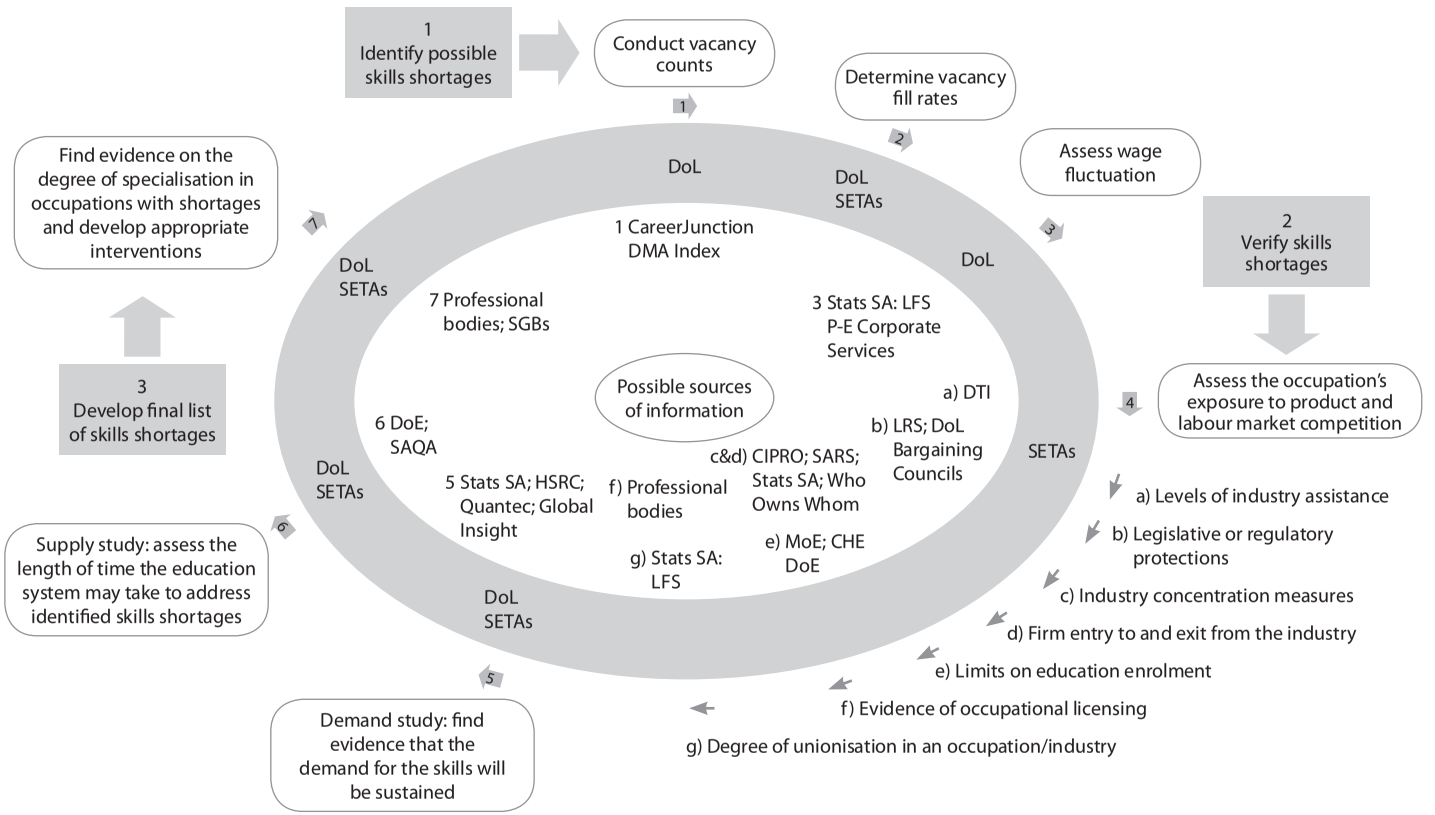
Identify possible skills shortages

The collection and analysis of *vacancy* information are widely used as means to provide insight into skills shortages (Clark & Phillips 2002; NZ DoL 2003). In South Africa, the only data on the number of *vacancies* at an occupational level available from Statistics SA (Stats SA) were collected in the Manpower Survey, conducted on an annual basis from 1987 to 1995, thereafter unfortunately discontinued. The reports, inter alia, provided information such as the number of posts, vacancies and vacancy rates within selected occupations in private and public enterprises in the formal non-agricultural business sector (Stats SA 2001).

A *vacancy count* is being generated from the *Sunday Times* by the DoL's Labour Market Information and Statistics (LMIS) unit (DoL 2003) and will be extended to include local newspapers in the service areas of provincial offices of the DoL. Counts can also be conducted off data contained in a vacancy register (for example, if and when the registration of vacancies at the designated labour centres of the DoL becomes mandatory). Although not comprehensive (that is, covering only a single or limited number of newspapers), there are private initiatives that are developing vacancy indexes for sale.

1 Government Gazette No. 30823, published for comment on 28 February 2008.

FIGURE 2.1: *Recommended framework for the identification and verification of skills shortages in South Africa*



For example, the *DMA Index,* a survey which is designed and managed by DMA People (2008), codes, captures and analyses both private-sector and government posts advertised in the *Sunday Times* Careers section, by function, sector and location. Internet-based recruitment services such as CareerJunction and Careers24 have databases of vacancies from which statistics can be generated. Both provide online services for job seekers and recruiters (CareerJunction 2008; Careers24 2008).

Vacancy fill rates provide evidence of the relative difficulty employers are experiencing in filling vacancies (Infometrics Ltd 2006: 21). Data on vacancy fill rates are not readily available but can be collected. National and provincial DoL officials responsible for capturing vacancy data can contact employers off the vacancy database at regular intervals to enquire if vacancies for advertised occupations have been filled. SETAs will need to negotiate with the DoL's LMIS unit to ensure that the timing and coverage of a survey of employers who have recently advertised vacancies (from which vacancy fill rates can be derived) meet an appropriate balance between the DoL's requirements and resource constraints. SETAs could collect vacancy data from employers on an annual basis (that is, with submission of WSPs).

Changes in *wages* for specific occupations may be symptomatic of changes in the relative availability of workers possessing the skills required for the occupation (Infometrics Ltd 2006: 22–23). Monitoring wage data is therefore an important means of identifying skills shortages. Currently, Stats SA collects information on the number of employees and the gross salaries paid in selected industries in the Quarterly Employment Statistics (QES) survey (Stats SA 2007). However, wage data based on the QES cannot be disaggregated by occupation. *Wage data* by detailed occupation are not readily available in the public domain, but are collected by private initiatives, such as P-E Corporate Services, and released to subscribers at a cost (see P-E Corporate Services 2008). The DoL's vacancy data capturers did capture salary data during the first half of the three-year period that ended in March 2007. An analysis proved that more than half (56.3 per cent) of the employers/recruiters that had published vacancies in the *Sunday Times* between April 2004 and March 2005 did state the remuneration on offer. National and provincial DoL officials responsible for capturing vacancy data can include the capturing of remuneration data.

Verify the identified skills shortages

After skills shortages have been identified, an assessment is needed to determine whether suitable (if any) policy responses have been made. It has been said that for certain occupations, changes in wages may be an indication of skills shortages. However, wage determination can be influenced by institutional factors as well, and evidence needs to be found that upward trends in wage pressures are indeed the result of a scarcity of skilled workers (Infometrics Ltd 2006: 20; Kittel 2001). This can be done by asking questions such as: Does wage growth reflect demand growth? Is it because of a lack of competition? Is growth related to productivity growth? How do unemployment levels and inflation impact on wage growth?

SETAs strive to answer these questions by gathering information needed for the first three chapters of their SSPs. In Chapter 1: Sector Profile, the SETA has to describe the sector in terms of current industrial and occupational coverage, and reflects on changes that have had or may have an impact on skills demand. Chapter 2 is entitled Demand for Skills and provides information on such demand. Based on the sector profile developed in Chapter 1 and an analysis of information from WSPs and ATRs, current and future skills needs are described. An analysis of employment trends and patterns (that is, vacancies, replacement demand and earning trends) provides an indication of growth or decline in particular occupations.

With regard to the assessment of the *occupation's exposure to product and labour market competition,* the following indicators and sources apply:

- Levels of industry assistance (e.g. subsidies, tariffs) – here an example is the support for the automotive sector through the Department of Trade and Industry's Motor Industry Development Programme.
- Judgements on legislative or regulatory protections – according to Kittel (2001), the institutional side of the labour market normally acts as an intermediary when wages are determined. The management of wage bargaining differs from organisation to organisation and it also depends on how wages are related to unemployment, productivity growth and inflation. Sources on wage determination and bargaining include the Actual Wage Rates Database under the auspices of the Labour Research Service (LRS), DoL and Bargaining Councils.
- Industry concentration measures (the degree to which industries are dominated by a few firms) – Companies and Intellectual Property Registration Office (CIPRO), South African Revenue Service (SARS), Who Owns Whom.
- Rates of firm entry to and exit from the industry – SARS, CIPRO, Stats SA's Business Register.
- Numerical limits on education enrolment or qualification attainment – Ministry of Education, Council for Higher Education, DoE.
- Evidence of occupational licensing – legislative framework, professional bodies.
- The degree of unionisation in an occupation/industry – Stats SA's LFS.

With regard to evidence that the current demand for labour relating to the specified skills will be sustained and whether there will be *occupational growth*, there are some useful data, such as Stats SA's Census and LFS data, the Employment, Growth and Development Initiative at the HSRC, Quantec and Global Insight, from which a national, multi-sectoral forecasting system for occupational employment forecasting can be developed. However, these data sets are not without their limitations.

With regard to evidence on the *length of time* the education system may take to address identified skills shortages or educational output, the DoE's further education and training (FET) output data and Higher Education Management Information System (HEMIS) and South African Qualifications Authority's (SAQA) National Learners' Records Database can be used. The bias towards higher education and training (HET) output and the paucity of data on the supply of intermediary-level skills through occupational learning have been noted.

It is expected of SETAs to play a more direct role in providing sector foresight studies, in spite of data deficiencies and ill-conceived labour market analyses conducted by many SETAs. South Africa lacks a labour market information system that provides coherent data on the occupational and sectoral structure of employment on a disaggregated level. Stats SA publishes labour market information on an aggregated level and makes disaggregated data available to the HSRC and other research institutions/service providers such as the Development Policy Research Unit, Quantec and Global Insight, who 'package' Stats SA data on request (that is, for a specific purpose/project). According to a report entitled *Developing a National Skills Forecasting Tool for South Africa*, modelling capacity is available in South Africa, which should facilitate development of a sound national forecasting model across all sectors to predict occupational employment (Wilson et al. 2004).

Develop a final list of skills shortages

It is only after identified skills shortages (using the first three indicators) are confirmed by a thorough labour market analysis (using the second set of three indicators) that a final list of occupations or skills shortages can be developed (based on the analysis of education supply and informed by an analysis of specialisation measures to determine which occupations or skills have a higher propensity to being exposed to supply).

Degree of specialisation

Fewer people will have suitable qualifications for occupations that are more *specialised*, which could result in labour shortages whenever a supply problem arises or a demand surges. Specialised training often takes a long time to complete, which will also affect the time it will take to resolve skills shortage problems. There is a lack of literature that addresses the issue of specialisation. However, for certain professions membership in a professional body is required for one to be legally allowed to practise that profession. Stringent membership requirements and high professional standards set by the professional bodies, and the duration and cost of the educational programmes that provide admission to the professions, can impact on the supply of skills. Indications of specialisation can be obtained from professional bodies and the relevant Standards Generating Body (SGB). The DoL's Organising Framework for Occupations (OFO) and occupation profiling process may also be a source of information.

The HSRC's verification study

As part of its larger project for the DoL, the HSRC attempted to verify skills shortages, firstly by comparing those listed in the National Scarce Skills Lists of 2006 (DoL 2006) and 2007 (DoL 2007b) with vacancies published in the *Sunday Times* over a period of three years (April 2004–March 2007); and secondly, by means of a survey of employers who had recently advertised vacancies to obtain an indication of fill rates.

Comparison between National Scarce Skills Lists and advertised vacancies

The aim of the comparison was two-fold: firstly, to show shifts between the 2006 and 2007 scarce skills lists and, secondly, to see to what extent vacancies verify these demands. A 'priority index' was developed in each occupational grouping to enable comparisons to be made between the two scarce skills lists and between the lists and advertised vacancies. The number of shortages listed for an occupation in each year (2006 and 2007) and the number of vacancies that were published for that occupation in the *Sunday Times* over a three-year period (April 2004–March 2007) were sorted in descending order and a value assigned (from the occupation with the largest number of shortages listed or vacancies published = 1, to the smallest number = 4, depending on the number of occupations in the group). A chart was created to visualise similarities and differences in the 'priorities' set with regard to listed shortages and vacancies published (see Figure 2.2).

Considerable differences between the three data sets were found. The most important differences are:

- No shortages were identified or published for the categories community workers and personal service workers through to elementary workers (OFO broad occupational categories 4–8) in the National Scarce Skills List 2006. More than half (51.67 per cent) of the skills shortages were for professionals, a quarter (28.24 per cent) for managers and a fifth (20.09 per cent) of the shortages were listed for technicians and trades workers.
- The National Scarce Skills List 2007 provides for all occupational categories (OFO categories 1–8). A third (34.05 per cent) of the skills shortages on the list are for managers, a quarter (27.42 per cent) for elementary workers, nearly a fifth (17.26 per cent) for professionals and a tenth (10.29 per cent) for technicians and trades workers.
- The vacancies published in the *Sunday Times* covered all occupational categories but the concentration of adverts was for professionals (50.37 per cent) and managers (30.52). Nearly a tenth (8.43 per cent) of the adverts placed over the three years were for clerical and administrative workers and only 5.35 per cent were for technicians and trades workers.

The reader is reminded to treat vacancy 'trends' with caution. Firstly, three years is too short a period upon which to base reliable forecasts of shortages. Although growth is measured across all major occupational groups, the pattern may be different on a disaggregated level. It was found that in one year, growth may be recorded in a sub-major occupational group of a major group, while the number of vacancies for another sub-major occupational group of the same major group stays constant; but the next year may show a reversed pattern, resulting in growth in the major occupational group. It was also found that in one year, growth may be recorded in a sub-major occupational group of a major group, while decline is measured for another sub-major occupational group of the same major group, but the next year may show a reversed pattern to balance out growth.

Secondly, not all employers use newspapers to advertise vacancies. Other recruitment sources include websites, specifically in the case of ICT professionals. It seems as if employers do not publish lower-level vacancies and rather recruit by word-of-mouth, because of an over-supply of these skills.

Advertised vacancies

In the second part of the vacancy research, the HSRC surveyed a selection of employers from a database of vacancies compiled by the DoL for the period March 2004–April 2007, to obtain indications of fill rates. Here too, there are reasons for a cautious interpretation of results. The survey results cannot be said to be representative of all advertised vacancies. The number of employers interviewed for advertised vacancies at sub-major group and unit group levels are very small for some occupations (fewer than 10 employers). High fill rates for vacancies in a major occupational group may mask the fact that some occupations in a sub-major group or unit group may be regarded as being in shortage due to a low vacancy fill rate.

A total of 112 828 vacancies were captured by the DoL for the three-year period and classified and coded according to the OFO system. There was a year-on-year increase in the total number of vacancies and for most of the major occupational groups. This had the effect that the share of vacancy adverts of the major occupational groups generally stayed the same across the three years.

There were 46 584 advertised job vacancies in Year 3 (March 2006–April 2007): 71.4 per cent more than in Year 1 (March 2004–April 2005). Increases in this period ranged from 56.1 per cent (for sales workers) to 3 266.7 per cent (albeit from a very low base) for elementary workers.

Fill rates

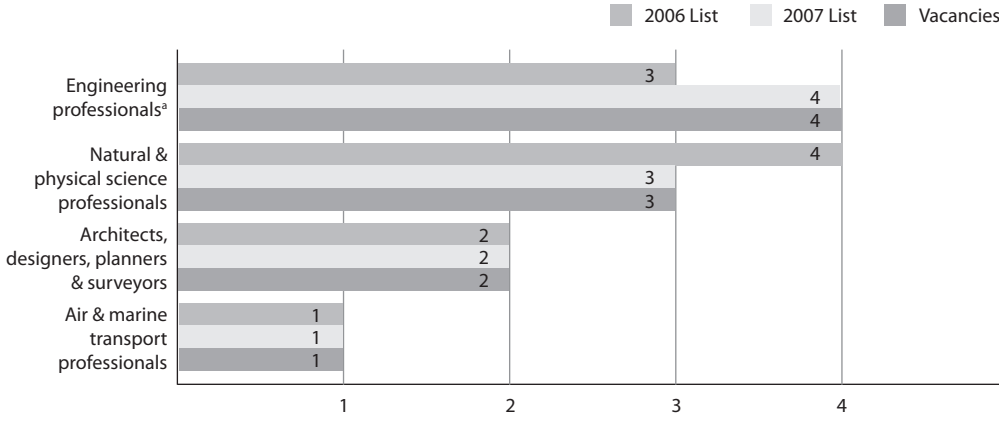
In the HSRC survey, a total of 1 107 employers across the first 6 major occupational groups of the OFO (which are managers; professionals; technicians and trades workers; community workers and personal service workers; clerical and administrative workers; and sales workers) were interviewed by telephone. Nearly a tenth (9.8 per cent) of the respondents did not state the number of vacancies, but those who did reported a total of 6 576 vacancies of which 5 754 (87.5 per cent) were filled. Fill rates lower than 80 per cent were recorded in the following occupational groups: technicians and trades workers (48.7 per cent) and professionals (77.4 per cent). Community workers and personal service workers (99.3 per cent), clerical and administrative workers (95.9 per cent) and managers (95.2 per cent) recorded the highest fill rates.

Strong similarities emerge on a disaggregated level, especially with regard to certain occupations. However, it is not claimed that similarities should be accepted as verification; conversely, differences should not be perceived as contradictions. Differences may draw attention to a specific occupation and open up discussion on why these differences occur.

The comparative analysis of listed shortages and advertised vacancies has confirmed that skills shortages identified may be justifiable in some occupations but questionable in others. Occupations are listed to be experiencing skills shortages (in large numbers) for which there is a sufficient supply of labour. But in many of the occupational groups, exact matches were found between the relative volume of shortages listed in the National Scarce Skills Lists of 2006 and of 2007 and vacancies published. There is an exact match between the shortages listed in the 2007 Scarce Skills List and vacancies published over three years for architects, designers, planners and surveyors; engineering professionals; and natural and physical science professionals (see Figure 2.2).

Improvements in the identification and reporting of scarce skills are constantly made by SETAs, in spite of a lack of data in some areas of analysis for skills shortages and the limitations of the data that are available. Many of these improvements are ascribed to the fact that SETAs were required to use the OFO in identifying scarce skills in the research, development and submission of their Five-Year SSPs. The majority of SETAs are now reporting scarcity at a detailed (i.e. 5-digit) level, which provides for much deeper clarity at specialisation levels and which enables more focused interventions, qualifications and training programme design and development, including more careful monitoring. The OFO represents a significant enhancement in respect of providing a skills-based coded classification system which encompasses all occupations in the South African context. Occupations are classified based on a combination of skills level and skills specialisations in such a way that it is simpler to locate a specific occupation within the framework and to cross-reference such occupations across economic sectors. It does seem as if occupations (rather than sectors) are becoming the point of departure in the identification of scarce and critical skills in South Africa. Skills shortages are usually measured in terms of occupations and qualifications.

FIGURE 2.2: *Comparison of listed shortages and advertised vacancies for design, engineering, science and transport professionals prioritised*



Sources: DoL 2006, 2007b; Erasmus 2008

Notes: a. Including 1 725 engineering professionals (no additional information provided for National Scarce Skills List 2007).

b. The numbers of vacancies published for each occupation were sorted in descending order and a value assigned (from the largest number of shortages listed or vacancies published = 1, to the smallest number = 4, depending on the number of occupations in the group). These numbers are shown on the bars in the figure.

Recommendations concerning vacancy information

The HSRC verification analysis highlights the value of vacancy information in identifying and verifying scarce skills. It is very important that the DoL continue with vacancy monitoring. But the process of collecting advertised vacancies should be expanded to include job vacancies from other newspapers and websites and not only from the *Sunday Times*.

The possibility of downloading information contained in vacancy advertisements electronically from newspapers and websites should be investigated and negotiated with the owners of these publications. This will lighten the tedious burden of capturing the information from job vacancy advertisements. If vacancy information can be downloaded, the DoL only has to 'clean' the data, that is, align data input fields, change fonts and case, delete duplications, etc. and classify advertised occupations according to the OFO.

There are a number of other resources that could be used: CareerJunction captures a large volume of vacancy data in an electronic format, in specific fields, and the data are publicly available. Keyword searches, at regular intervals, can reveal trends (that is, increase/decline in the number of vacancies posted for an occupation), and the information on the vacancies for the occupation can be downloaded to look for other trends such as wage fluctuations. The best that one can hope for is that the DoL gains access to a database of this kind in such a way that vacancy postings can be coded according to the OFO and used for vacancy counts.

The DoL should embark on a drive to educate employers (and all reporters of skills shortages) to accept that an occupational framework such as the OFO should not merely be used for the sake of statistical reporting. Unless the OFO is used to inform the naming conventions of jobs/posts within an organisation, the statistical reporting of the demand for skills will be inaccurate. The associated competence profile of the occupation should also inform the job and post profiles used by employers/organisations. By ensuring parity between occupations and their profiles and between jobs and their profiles, the reporting of skills needs can become more accurate. Services such as CareerJunction and Careers24 could post the OFO on their website for use by recruiters in order to identify jobs (and tasks and skill levels), which would help foster consistency in the use of job titles.

If vacancy information has to be captured manually onto a database, a key set of input fields must be identified. Data for these variables must be captured in a consistent manner and be as complete as possible. Key input fields may include:

- job title (as was stated in the advertisement);
- contact details (name of employer/recruitment agency; contact person; address; telephone/facsimile/cell phone number(s) and e-mail address if provided);
- salary (if stated, must be recalculated to a similar time period, e.g. monthly, for all);
- the location of the job (to get regional distribution – could also be derived from employer's address);
- required educational level;
- required experience; and
- equity requirements.

It is important to capture the job title as it was published in the advertisement. This allows for future coding and analysis of the database. Contact details are needed if a survey of employers who have recently advertised vacancies is planned. Salary data can be used as an indication of wage pressures. If information for these three input fields (job title, contact details and salary) is captured consistently and correctly, the DoL will be able to collect data and calculate the three prime indicators for identifying

the presence of skills shortages, namely: (1) the relative volume of vacancies; (2) vacancy fill rates; and (3) evidence of wage pressures.

A system that classifies and codes job titles electronically has to be identified/developed and adopted. Examples include the VLOOKUP or HLOOKUP function in MS Excel, the 'expression builder' function in MS Access and the 'automatically recode' function in SPSS. Only job titles that are not automatically coded (using an occupational classification system, for example, the OFO or the South African Standard Classification of Occupations (SASCO)) have to be coded manually. A concordance is being developed that can be used to map SASCO occupation titles and classification codes to the OFO.

Vacancy data have to be analysed and the results reported on a regular basis (that is, at least quarterly). This will enable technical users, particularly SETAs, to monitor the number of advertised vacancies in each (relevant) occupational category over time and to incorporate observed trends into their identification of scarce skills. SETAs have to assert if and why fluctuations occur, find reasons for constant increases (or decreases) and determine if this up-/downward trend will be sustained.

Users of vacancy data will need to be mindful of the fact that vacancy counts provide an indicator of relative job vacancies (either across time or between occupations), not of the absolute number of vacancies. The vacancy count measures will need to evolve over time so that the vacancy count reflects changes in job search practices (for example, use of web-based advertising), yet also ensure that this does not compromise interpretation of the counts over time.

General conclusions and recommendations

It is only after identified skills shortages (using the first three indicators) are confirmed by a thorough labour market analysis (using the second set of three indicators) that a final list of occupations or skills shortages can be developed (based on the analysis of education supply and informed by an analysis of specialisation measures to determine which occupations or skills have a higher propensity to being exposed to supply). Indications of specialisation can be obtained from professional bodies and the relevant SGB. The DoL's OFO and occupation profiling process may also be a source of information.

It is strongly recommended that the DoL take responsibility for overseeing the centralisation of a process to develop baseline data for the occupational and sectoral structure of employment within the South African economy. The key data sets providing information on occupational and qualification employment structures exist, although these do have their limitations and need to be further developed and improved if the reliability of this kind of exercise is to match that in other countries. For example, by pooling two data sets per year (that is, those for February and September), a reasonable sample size can be obtained from the LFSs. SASCO data will have to be aligned with the OFO (a concordance is being developed). Occupational trends over at least seven years (2000–2007) can be identified and verified. With the help of occupational and industry experts, extreme data fluctuations can be described or 'smoothed out' if needed. After 'cleaning', the data set can be suggested as the baseline, which can be updated annually and used to describe current employment or as part of occupational forecasting modelling. Examples of such modelling capacity do exist in particular sectors (most notably the financial and accounting sector), which suggests that, in the longer term, such modelling might be feasible if certain data gaps can be filled by new primary data collection.

Ultimately, such a system would allow users to view, for example, a labour market profile of an area (that is, national, provincial, local) and can include data on population, employment (disaggregated by occupation and sector), unemployment, qualifications and earnings – cross-tabulated with demographics such as race, gender and age. To reiterate, it is proposed that a regularised system for making

quantitative employment projections, at national level, be set in place. This should include detailed sectoral, occupational, qualification and remuneration elements, including estimates of replacement demands.

The DoL also has to take (some) responsibility for the analysis and regular reporting of labour market data to help identify trigger indicators that an occupation is susceptible to skills shortages and/or that problems are emerging.

References

CareerJunction (2008) *About CareerJunction*. Accessed 18 January 2008, www.careerjunction.co.za/inf/abt.asp

Careers24 (2008) *About us*. Accessed 17 January 2008, www.careers24.com/Info/AboutUs.aspx

Clark K & Phillips MA (2002) *A comparison of job openings surveys: Concepts and survey design*. Washington DC: Bureau of Labor Statistics. Accessed 14 November 2007, www.bls.gov/ore/pdf/st020100.pdf

DMA People (2008) *The DMA index*. Accessed 18 January 2008, www.dmapeople.co.za/indexsurvey.html

DoE & DoL (Department of Education & Department of Labour, South Africa) (2007) Enhancing the efficiency of the National Qualifications Framework. Joint policy statement by the Ministers of Education and Labour, South Africa. Pretoria: DoE & DoL

DoL (Department of Labour, South Africa) (2003) Job vacancies and scarce skills. Preliminary analysis and an approach towards a South African job opportunity index. Labour Market Skills Development Programme, DoL, Pretoria. Paper funded by the European Union under the European Programme for Reconstruction and Development

DoL (2005) *Guide for development of five-year sector skills plans and annual updates for 2005–2010*. Pretoria: DoL

DoL (2006) *National scarce skills list 2006 (Asgisa aligned)*. Pretoria: DoL

DoL (2007a) *Framework for identifying and monitoring scarce and critical skills*. Final draft. Accessed 4 July 2008, http://www.labour.gov.za

DoL (2007b) *National scarce skills list 2007*. Pretoria: DoL

Elliot G (2007) Scarce & critical skills. SETA updated draft list. PowerPoint presentation prepared for the Skills Focus Group, 30 May, DoL, Pretoria

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and varification of scarce and critical skills in the South African labour market. Report commissioned by the Department of labour, Pretoria

Infometrics Ltd (2006) *Indicators of skills shortage.* Accessed 14 November 2007, www.dol.govt.nz/PDFs/skills-shortage-indicator-report.pdf

Kittel B (2001) How bargaining mediates wage determination: An exploration of the parameters of wage functions in a pooled time-series cross-section framework. Max-Planck-Institut für Gesellschaftsforschung Discussion Paper 01/3. Accessed 14 November 2007, www.mpi-fg-koeln.mpg.de/pu/mpifg_dp/dp01-3.pdf

NZ DoL (New Zealand Department of Labour) (2003) *Identification of a survey option for the collection of vacancy information in New Zealand. Labour market policy group*. New Zealand: Department of Labour

P-E Corporate Services (2008) *Salary surveys*. Accessed 15 January 2008, www.pecs.co.za/prodSalary.htm

Singizi cc (2007) *SETA review*. Cape Town: Employment Promotion Programme, managed by the Development Policy Research Unit, University of Cape Town

Stats SA (Statistics South Africa) (2001) *Manpower survey 1995. Report No. 02-01-01(1995).* Pretoria: Stats SA

Stats SA (2007) *Quarterly employment statistics September*. Statistical release P0277. Pretoria: Stats SA

Wilson R, Woolard I & Lee D (2004) *Developing a national skills forecasting tool for South Africa.* Coventry: Institute for Employment Research, University of Warwick & Pretoria: Human Sciences Research Council

CHAPTER 3

Managers

Loyiso Mbabane

Introduction

The task of defining a manager, as well as the management profession, is made difficult by the wide divergence that exists in types of manager, as well as in their areas of specialisation, levels in the occupational hierarchy, types of qualification, divergent demands of the job, variety of economic sectors in which they play a role, and so on (see for example Borgelt & Falk 2007; Holian 2004; Khurana et al. 2005a, 2005b). Khurana et al. (2005a) define managers as 'principally salaried employees of an organization who perform tasks involving the coordination of the labour of others, in positions requiring at minimum a four year college degree, and with general knowledge of one or more business functions'. According to Mintzberg (1971; 1996), managers fulfil 10 different, highly inter-related roles, which could be divided into three sets of roles, namely interpersonal, informational and decisional. In turn, managers require three sets of skills to perform these roles: technical skills, human skills and conceptual skills (Robbins 2001, cited in Elmuti 2004: 442).

So the first challenge that one confronts in attempting to define the skills shortage among managers is the basic issue of who or what a manager is. Understanding the extent to which management is a 'profession' is a second important challenge that must be addressed in a study of management skills. This chapter begins with a discussion of this question. This is followed by a consideration of business education aimed at development of management skills. The chapter then analyses the extent of demand for managers in South Africa, as far as this can be ascertained from available data, and the nature and extent of the supply of managerial skills emerging from higher education institutions. The analysis concludes with a consideration of the ways in which management education practices are responding to policies aimed at promoting employment equity in the country.

Defining management as a profession

> If management was a licensed profession on par with law or medicine, there might be fewer opportunities for corporate bad guys. (Khurana et al. 2005a)

If one uses the strict definition of a profession as '[a] group of people whose practice is shaped by training and credentialing against a rigorous body of knowledge' (Spender 2005: 1282), management does not yet qualify as a profession. There is no single training programme or degree requirement for managers; nor are there uniform and global credentials for membership or a common body of knowledge associated with managerial competence. Unlike other well established professions (for example,

teaching, law, engineering or accounting), management lacks a set of institutions designed to certify that its practitioners have a basic mastery of a core body of specialised knowledge and can apply it judiciously (Khurana et al. 2005b). Management does not qualify against some key criteria of what constitutes a profession, namely, explicit membership rules to exclude the unqualified; a strong ideological and ethical component to guide professional work; and the abstract and generalised nature of professional knowledge that can allow professionals to adapt to a range of situations (Trank & Rynes 2003, cited in Cabrera & Bowen 2005: 793). Establishing itself as a 'true profession' is therefore the abiding challenge for management.

One of the characteristics of a profession noted above is a 'common body of knowledge', so that a human resources (HR) manager in a factory in Lagos has more or less the same 'core' body of knowledge of 'management' as her counterpart in a factory in Geneva, with the necessary variations and specialisations. This leads us to pose the question of how managers are developed, what their education consists of and how relevant it is.

The challenge of management education

Elmuti (2004: 440) notes that, in general, 'management education', as commonly practised, views management as a discipline that can be learned through classroom (off-site) and other applied pedagogical techniques, normally in degree-granting institutions. A number of concerns have been raised regarding management education, including the fact that it may have become 'over-professionalised' in reaction to accusations that it lacks scientific rigour; it has been condemned for 'professionalising – perhaps to a pathological degree – around quasi-scientific research methods and a regulated body of knowledge visibly distant from what managers use' (Spender 2005: 1289). According to some critics, any professionalisation of management, as well as the approach taken to the education of managers, should recognise that management is a science as well as an art (Holian 2004; Spender 2005). As an art, the management profession would have to undertake 'self-conscious consideration of experiencing the constraints against which their imagination is thrown. This requires hard work, serious commitment to the community, serious pushing at the limits of practice and serious consideration of the resulting impact on others' (Spender 2005: 1289). Furthermore, although the 'scientific' aspects of management may be easily taught, 'it may be more difficult to teach the arts or crafts related to sound judgement, creative inspiration and entrepreneurial innovation' (Holian 2004: 399).

Elmuti (2004) notes that 'at present, scholars have come to the conclusion that management can be learned and taught'. He points out, however, that there are some aspects of management practice that depend on the innate qualities of a person, namely, the ability to engage people individually, the capacity for intense engagement with tasks, quantitative intelligence, emotional intelligence and strong competitiveness. On the other hand, there are skills which can be learned, such as communication and analytic skills. Elmuti outlines the characteristics which must be possessed by effective managers. In this regard, he presents a five-dimensional model of management (Elmuti 2004: 443):

1 managing self;
2 managing relationships;
3 managing organisations;
4 managing contexts; and
5 managing change.

Reflecting on the multi-faceted nature of management as an occupation, Doh (2003) observes that the '[m]ost responsive individuals are those with high achievement and ambition needs, a strong capacity for strategic thinking, a strong degree of pragmatism, a baseline of effective communication skills

(both in terms of persuasion and inspiration), a measure of emotional intelligence, and a genuine learning orientation'.

The above discussion should illustrate the challenge that confronts us as we define 'management skills' and seek to determine whether or not there is a shortage of these skills. We are, firstly, confronted by an unregulated profession, which means, among other things, that there is no 'official registry' of managers in South Africa. Secondly, when it comes to the education of managers and the 'skills' that they should develop, we are confronted with a profession that is still in its formative phase, with divergent views about the extent to which it is a science or an art. And this is not where the challenge stops. Top managers of companies, government departments and even political parties have almost destroyed their institutions (and in cases such as Enron, Parmalat and Fidentia, have in fact succeeded in doing so), because of unethical conduct and/or harmful business practices. It is not the 'hard science' aspects of the training (such as understanding of high finance or advanced operations management) that have been the biggest weakness of managers, leading to these crisis situations, but the 'soft functions' that involve 'social trusteeship', including ethical and moral issues. A fundamental paradigm shift therefore needs to occur in the value system of managers, and this ought to be reflected in the skills that are imparted by management training institutions. This issue is discussed in the next section.

Social development, trusteeship and social responsibility challenges facing the management profession

The management profession has a long way to go in rising to the challenge of the social and developmental expectations that are increasingly placed on it. It is generally still seen as '[a]n instrument of market-driven, industrialized, bureaucratic society…steeped, indeed, brainwashed, in mechanical, market-driven professionalism. [Its] watchwords are planning, organising, motivating, controlling, stability, conformity, predictability, regulation' (Thomas 2006: 311–312). All this is to the exclusion of social trusteeship. Consequently, management has been accused of 'epistemopathology', which is 'diseased, sick and bad knowledge that is mechanically applied to contemporary (global) market systems, in self-serving ways, to identify and solve immediate problems, problems which are not well understood and without any consideration of ripple effects on society as a whole' (Thomas, 2006: 311).

A radical shift is recommended for the profession, whereby it becomes a 'globally networked society, dedicated to promoting social welfare, with citizen professionals dedicated to sustainable, integrated, equitable social and economic development' (Thomas 2006: 312). This new type of management profession requires a clear, comprehensive vision of the good and just society and its place in the world order. It also entails the abandoning of management's pretences to value-neutrality and objectivity, and a new focus on ethical-moral and social responsibility as it confronts the citizens of global, cosmopolitan democracies (Thomas 2006). Thomas admonishes the management profession not to be 'seen merely to be the servants of our capitalist masters', but to 'demonstrate that it can serve society in general' (2006: 313). With this critique in mind, management education ought likewise to transform itself, and go beyond the 'scientific' and 'functional' aspects of management. It should make explicit its claims about its core, higher-order values and its contribution to societal progress and well-being (Cabrera & Bowen 2005: 805). The management profession should 'collectively aspire to articulate a set of core values and professional conduct norms that would guide professional practice around the world' (Cabrera & Bowen 2005: 805).

In order for management education to benefit society, it should result in four outcomes: value creation (both financial and non-financial, for customers, employees, suppliers, investors and communities); economic growth and improved competitiveness; improvement of the human condition; and a

balance between social and economic interests (Elmuti 2004: 484). At the same time, it should equip future managers to be proficient in strategic thinking, communication, leading teams, motivation and creative/entrepreneurial thinking (Elmuti 2004: 450).

In terms of these critiques, the 'common body of knowledge' requirement for management to qualify as a profession needs some serious overhaul so that it incorporates the new paradigm and value system that has been adumbrated above. Some progress has been made toward this paradigm in South Africa, and our business schools are more or less on par with those in the rest of the world, but there are challenges to be met, as noted in the next section.

Business education in relation to 'new management' challenges

International concerns about the nature of the management profession and the challenge of educating managers are corroborated in South African research on the main trends, concerns and future directions of management. Van der Colff (2004) argues that 'it is time to rethink the core concepts of management education and get past the finance, human resources, marketing and even strategy', and that 'the nature of managerial work – not the functions worked on – should provide the foundations for management education' (Van der Colff 2004: 504). The report of the Council on Higher Education (CHE), arising out of its 2002–2003 review and accreditation of the Master of Business Administration (MBA) degree providers in South Africa, points out that the content of MBA programmes in South Africa is fairly responsive to the development agenda set by the government; hence the importance of topics such as globalisation, entrepreneurship, employment equity and business ethics in their curricula (CHE 2004: 124). However, the CHE report questions the depth of the commitment of South African business schools to the creation of radically new and unique worldviews and approaches to business in the African context, amongst the management students that they are educating: 'Given South Africa's history, it is difficult not to wonder about the capacity of business schools through their MBA programmes, to change the manner in which business schools articulate with society' (CHE 2004: 124). The authors of the report ask whether business schools are conservative or subversive: 'Are they simply a vehicle for changing the racial composition of business in South Africa, or can they redefine the relationship between business and society?' The CHE points out that 'responsiveness can be reactive and limited to skills development, or it can take up topical issues, or it can be proactive and, through knowledge production, challenge established concepts and practices' (CHE 2004: 124). The report concludes by pointing out that, more than 50 years after the start of the first MBA programme in South Africa, business schools are being asked to redefine their identity. Business, government and society are making demands on them at a time when they also have to raise their standing as postgraduate programmes. In its view, '[h]ow to remain faithful to the contents of a postgraduate business management programme and yet become relevant for local society is probably the greatest challenge that lies ahead' (CHE 2004: 127).

It would seem that business schools in South Africa, as in the rest of the world, are continually reviewing their curricula to include new challenges. It is one thing, however, to include new topics or modules in a diploma or a degree, or even to 'embed' them; it is another to alter, fundamentally, the way in which faculty, researchers, case study writers and all the other key players view life and the role of managers within this. This is what the CHE is referring to when it talks of being 'proactive, and, through knowledge production, challeng[ing] established concepts and practices' (2004: 124). South Africa is definitely far from being 'there' yet. Value systems cannot be tackled at the level of the business school only. The current leadership of the public and private sectors also needs to espouse and demonstrate social trusteeship and similar values. The analysis of existing management education in South Africa, in later sections of this chapter, shows that many of managers currently employed in diverse sectors of the economy have studied Business, Commerce and Management (BCM). This implies that business

colleges and business schools have a great deal of influence on the future direction of management in the country.

The next section turns to the 'supply side' of the profession, and considers the nature of the 'skills shortage' in relation to management.

The skills shortage debate

In the context of current debates about the meaning and extent of 'scarce' and 'critical' skills, the National Skills Authority (NSA) Briefing Paper on Scarce and Critical Skills points out that 'unfortunately, understanding and application of these definitions and the development of measures to identify and distinguish between scarce and critical skills have proven to be both complicated and contested' (NSA 2007: 3). This makes the enquiry into the 'shortage' of management skills equally complicated. An enquiry into skills shortages in management must take account of how the current managers obtained their skills (that is, what education or training process they went through). Assuming that this can be established, the enquiry must then investigate the supply of future managers who are studying in the required fields, as established. In this way, some sense of the current supply of managers can be measured against the future shortage or surplus. This assumes, of course, that there can be some agreement on the training or qualifications that are required for management.

Another indicator would be the 'qualifications' that employers specify in their advertisements for 'managers'. Once again, this may work if employers do indicate such 'qualifications' and if these are generally standard across all sectors. On the other hand, the Centre for Development and Enterprise (CDE) cautions that the term 'scarce skills' can be misleading to the extent that it suggests that external training of various kinds can provide the answer in the short term, whereas a survey of 40 firms by the CDE shows that by far the most important need defined by employers is for 'experience and acquired competence', an attribute that is relatively independent of formal qualifications or training (CDE 2007: 6).

To identify the extent of a 'skills shortage' with regard to managers, we need to look at the supply-side factors as well as those on the demand side. If there is a scarcity, and it is caused by the unavailability of managers, how can they be made more available? In the next section, we analyse the qualifications of managers; this is followed by an analysis of the numbers of qualified individuals being produced by higher education institutions in the field of BCM, in order to ascertain if there is an adequate supply of people, at least in terms of qualifications. The issue of experience is more complicated, as one cannot, for example, expect an airline to complain that it cannot get pilots with 'all the necessary experience', when it has not been developing any. Industry and commerce thus need to take responsibility for developing supplies of managerial experience; this relates to the question of values and principles that was raised earlier in the chapter, and will be discussed again below in relation to the issue of employment equity.

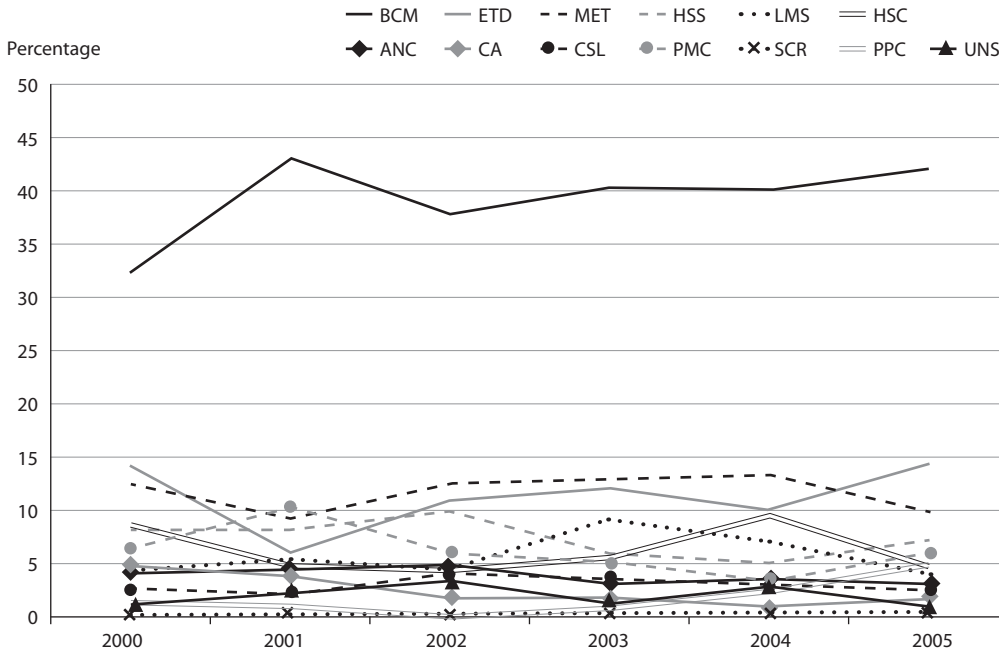
Qualifications of practising managers

> Whilst credentialing sells well at the present moment...many executives tell us they prefer to hire liberal arts graduates or PhD physicists. They find them adaptive and creative, while the MBAs' imaginations seem calcified by irrelevant – but rigorous – theory and questionable ethical attitudes. (Spender 2005: 1290)

Figure 3.1 shows the fields of study that have been undertaken by managers who were practising in South Africa in 2000–2005. It is clear from the figure that the greatest share of managers by far (more

than 40 per cent) studied BCM during this period. It accounted for 33 per cent of all study fields in 2000, and this increased to 42 per cent in 2005, after a slight dip in 2002. The second-largest field of study for managers is the Education, Training and Development (ETD) field, although this accounted for less than half the contribution of BCM. The inconsistent performance of ETD and its subsequent decline may reflect the public service share of managers in the Human Sciences Research Council (HSRC) data set from which this analysis is derived (Erasmus 2008; see also Bhorat 2004). Studies in the field of Manufacturing, Engineering and Technology (MET) also dropped from a high of 13 per cent in 2000 to 9 per cent in 2001, rising again to 13 per cent by 2004, before dropping back in 2005 to 10 per cent.

FIGURE 3.1: *Fields of study of practising managers, 2000–2005*



Source: Quantec 2007

Notes: CSL= Communication studies and language
ETD = Education, training and development
MET = Manufacturing, engineering and technology
HSS = Human and social studies
LMS = Law, military science and security
HSC = Health sciences and social services
ANC= Agriculture and nature conservation
CA = Culture and arts
BCM = Business, commerce and management
PMC = Physical, mathematical, computer and life sciences
SER = Services
PPC = Physical planning and construction
UNS = Unspecified

TABLE 3.1: *Changes in employment, by sector and gender, 1995 and 2005*

Sectors & sub-sectors		1995			2005			Average annual growth rate (%)		
		M	F	Total	M	F	Total	M	F	Total
Primary sectors	N	1 400	277	1 677	996	340	1 336	−3.3	2.1	−2.2
	%	83.5	16.5	100	74.6	25.4	100			
Agriculture	N	978	258	1 236	608	317	925	−4.6	2.1	−2.9
	%	79.1	20.9	100	65.7	34.3	100			
Mining & quarrying	N	422	19	441	388	23	411	−0.8	1.9	−0.7
	%	95.7	4.3	100	94.4	5.6	100			
Secondary sectors	N	1 467	499	1 968	2 047	694	2 741	3.4	3.3	3.4
	%	74.5	25.4	100	74.7	25.3	100			
Manufacturing	N	976	461	1 437	1 113	593	1 707	1.3	2.6	1.7
	%	67.9	32.1	100	65.2	34.8	100			
Utilities	N	74	10	85	77	23	100	0.3	8.8	1.6
	%	87.1	11.8	100	76.8	23.2	100			
Construction	N	417	28	446	858	77	935	7.5	10.7	7.7
	%	93.5	6.3	100	91.7	8.2	100			
Tertiary sectors	N	2 823	2 876	5 700	3 990	4 202	8 195	3.5	3.9	3.7
	%	49.5	50.5	100	48.7	51.3	100			
Wholesale & retail trade	N	920	748	1 668	1 543	1 480	3 024	5.3	7.1	6.1
	%	55.2	44.8	100	51	49	100			
Transport, storage & communication	N	406	71	447	491	125	616	1.9	5.8	2.6
	%	85.1	14.9	100	79.7	20.3	100			
Financial & business services	N	318	262	581	739	556	1 296	8.8	7.8	8.4
	%	54.7	45.1	100	57	43	100			
Community, social & personal services	N	1 080	1 095	2 175	1 000	1 192	2 192	−0.8	0.8	0.1
	%	49.7	50.3	100	45.6	54.4	100			
Private house-holds	N	99	700	799	217	850	1 067	8.2	2.0	2.9
	%	12.4	87.6	100	20.4	79.6	100			
Total	N	5 798	3 717	9 515	7 055	5 242	12 301	2.0	3.5	2.6
	%	60.9	39.1	100	57.4	42.6	100			

Source: Adapted from DoL 2007c: 123.

Notes: N = number (000); M = male, F = female.

The data shown in Figure 3.1 reflect the performance of the manufacturing sector and its contribution to the South African economy in general during the period under review. In terms of the economic performance of the various sectors between 1995 and 2005, the manufacturing sector registered an average annual growth rate of only 1.7 per cent between 1995 and 2005, compared to the financial and business services sector (8.4 per cent average annual growth per annum) (Table 3.1). Construction, on the other hand, grew at an average annual rate of 7.7 per cent during the same period, while the wholesale and retail trade sector registered an average annual growth rate of 6.1 per cent per annum during the same 10-year period (DoL 2007c).

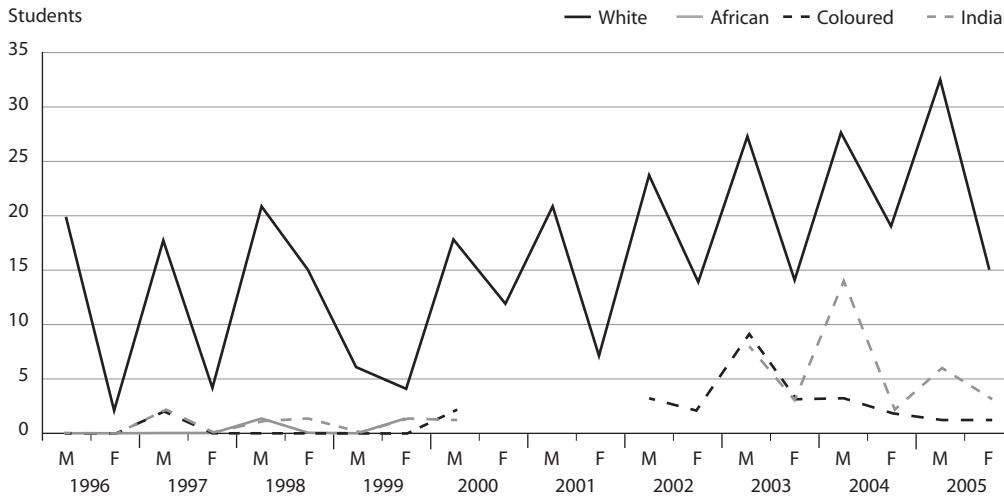
The percentage growth rates in the number of managers generally reflect the economic performance of the related sectors. There was some growth in the percentage of managers with qualifications in human and social studies (HSS) between 2000 and 2002, albeit off a very low base. The HSS field's share of management studies was about 7 per cent in 2000; it rose to 10 per cent in 2002, before dropping to 7 per cent again in 2005. Culture and arts (CA) constitutes a very small percentage of the qualifications of managers. It dropped from the very low share of 5 per cent in 2000 to a paltry 3 per cent in 2005. The most significant point in relation to this field, though, is that we do have some managers with qualifications in the field of culture and arts. The other field that had a very low percentage (below 5 per cent) was physical planning and construction.

These percentages provide a general overview of the nature of formal qualifications (and therefore of skills) possessed by currently practising managers. Given that BCM is by far the most common field of study for most practising managers, the next section provides a more detailed analysis of the students who are studying at different levels in this field, to ascertain the nature of future supply.

Findings on graduates/diplomates in the field of Business, Commerce and Management

Figures 3.2–3.5 provide breakdowns of the racial and gender composition of graduates at the doctoral, master's, bachelor's and diploma levels for the period 1996–2005.

FIGURE 3.2: *Doctorate in Business, Commerce and Management (BCM), by race and gender, 1996–2005*



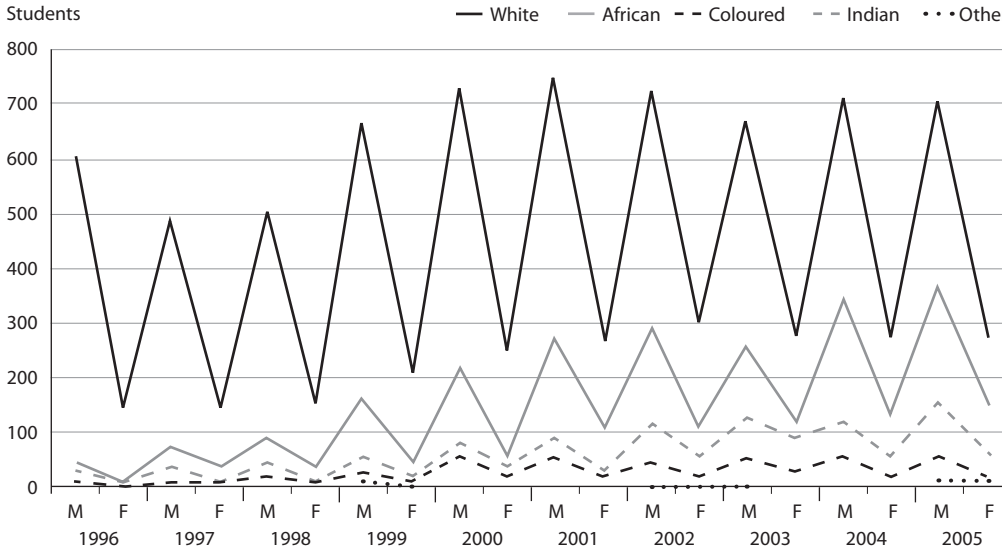
Source: DoE 2006: 35–40

Note: M = male; F = female

Figures 3.2–3.5 reveal that African women are over-concentrated at the lower-level qualifications (mainly the entry-level National Diploma (ND) in Business and Management). In fact, their proportion increases dramatically after 1999. The number of African women doing the ND more than quadrupled over the 9-year period reviewed, from some 1 000 students in 1996 to a peak of 4 500 in 2004. This represents a staggering 350 per cent average growth each year. There is also an observable decline in the number of white people doing NDs in Business and Management, during the same period. They decline from a very low base of some 1 500 to less than 500 graduates by 2005.

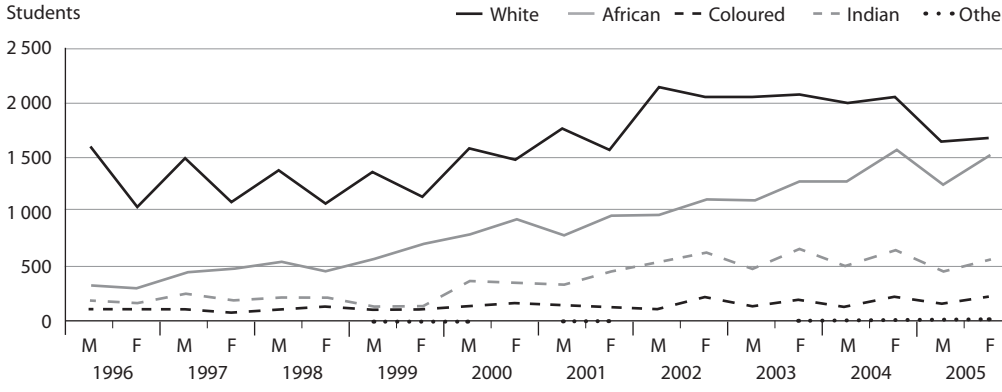
The gender imbalances in society are also played out in the progression from ND to degree. It is noticeable how, even within the African category, men start dominating at the Bachelor of Technology (BTech) degree level, in comparison to the ND. From 2001, the BTech, for which the majority of graduates

FIGURE 3.3: *Master's degree in BCM, by race and gender, 1996–2005*



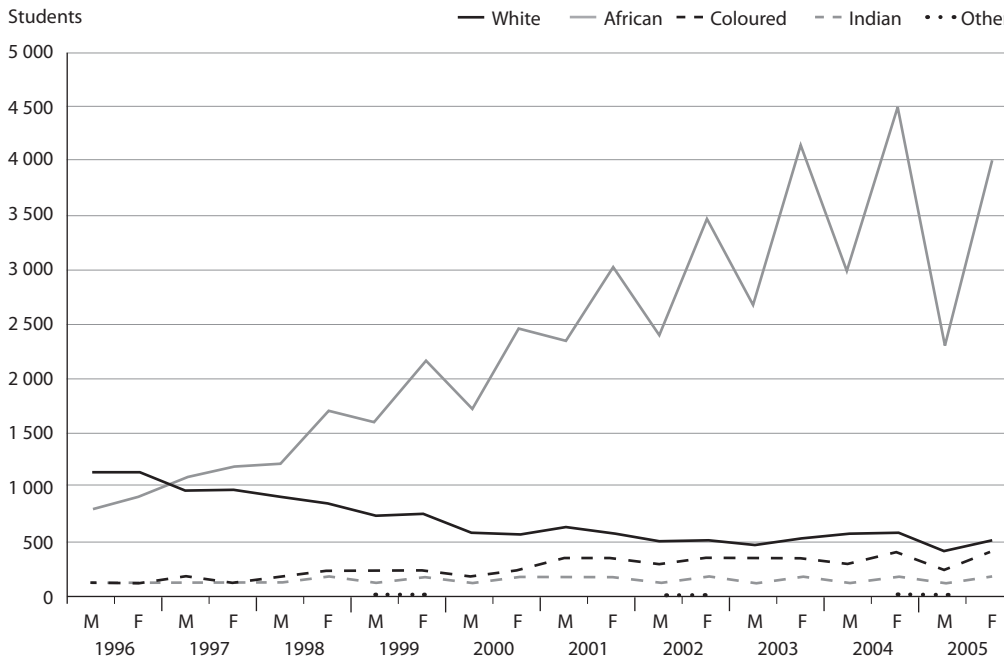
Source: DoE 2006: 35–40

FIGURE 3.4: *Bachelor's degree in BCM, by race and gender, 1996–2005*



Source: DoE 2006: 35–40

FIGURE 3.5: *National Diploma in BCM, by race and gender, 1996–2005*



Source: DoE 2006: 35, Table 18

had previously been white men, changed to having African men as the majority of graduates. The African male domination was reversed, however, by 2003, when African women began to dominate at this level. The number of white graduates with a BTech (in the BCM field) began declining gradually in 2001, a trend that was dramatically reversed in relation to university degrees. A remarkable rise in the number of white graduates with bachelor's degrees in Business and Management took place in 2001. This group swelled from 1 500 graduates to just above 2 000 (over a mere 12-month period), a jump of 33.3 percent. An interesting phenomenon also occurred with regard to white graduates with bachelor's degrees from 2001: the gender imbalance between white male graduates and white female graduates was almost completely eliminated. This gender imbalance, which was evident before 2001, was eliminated consistently thereafter, even when the number of white graduates with bachelor's degrees dropped in 2005. In fact, white female graduates started to take the lead, numerically. African graduates almost caught up with white graduates by 2005. The BTech trend was maintained here, with African women starting to dominate from 2003 onward.

This pattern was not maintained at the level of postgraduate diplomas and master's degrees, which are the degrees for which most students/employees (full-time and part-time) would register to increase their knowledge of management. The postgraduate degree in business and/or management is also the degree that is important for 'non-management' professionals who find themselves in management or who want to work in that field. It is the postgraduate diploma and MBA offerings, therefore, that would most closely reflect the supply of 'potential' managers. As observed above, the ND and BTech profiles of graduates are completely and dramatically reversed when it comes to honours, master's and doctoral levels. The latter are all totally dominated by white men, *and this trend actually increased over the period 1996–2005, contrary to expectations or common belief.*

At honours level, white male graduate numbers increased from 1 200 in 1997 to 1 300 in 2004. This constitutes an average annual growth rate of 0.6 per cent, but from a very high base in relation to the number of black and female graduates. Numbers of white female graduates at honours level made a remarkable climb from 600 in 1997 to 1 150 in 2004, a 6.4 per cent average growth annually over that 7-year period. The highest growth rate at honours level was, however, experienced by African men and women, albeit at far lower levels in real number terms compared to white men and white women. The number of African male graduates increased from a little less than 20 in 1996 to just over 400 in 2004. This is a staggering 133 per cent growth rate per annum over the 7-year period. Numbers of African women also registered a remarkable increase, almost catching up with African men. They increased from less than 20 in 1996 to just above 380 in 2004 (a 126 per cent average increase per year). The combined total of white graduates with honours degrees in Business Management and Business Science in 2005 was 2 500. The number of black graduates at the same level was less than 900.

The graduation statistics for the MBA (and other master's degrees in the BCM field) show similar trends, although the male domination of this group is startling in relation to both black and white graduates. There were some 700 white male master's graduates in 2005, compared to 250 white female graduates. There were 350 African male graduates, compared to some 130 African female graduates. The number of white female graduates trailed way below that of white male graduates over the 9-year period from 1997 to 2004. In fact, the number of white female master's graduates (in the BCM field) remained static (at some 280) between 2001 and 2005. African male master's graduates caught up with white female graduates in 2001; the number in each group was 280. The number of African male graduates increased to 380 graduates by 2005, while the number of white female master's graduates remained at 280. The number of African female master's graduates witnessed a steadier rise from 100 in 2001 to 150 in 2005. From honours level up to doctoral level, the number of coloured graduates was very low. Indian graduates show some notable representation and increase at these levels, although from a very low base.

There are hardly any women doing doctorates in business and/or management. African people started graduating with doctorates in 2002 (3 people) and by 2004 this had increased to 14. There is also a notable representation of Indian people at doctoral level (3 men in 2003 and 3 women). The latter had reduced in number by 2005, however. This is in contrast to white male PhD graduates, whose number actually increased from 20 in 1996 to 33 in 2005. This is a 5.2 per cent average growth rate over the 8-year period. *This is complemented by a surprising increase (especially in view of the master's trends) in the number of white female PhD graduates*. Their number increased from 3 in 1996 to 15 in 2005. This amounts to a 32 per cent growth rate per year. The numbers of black PhD graduates in 2005 had dropped to 5 (Africans) and 7 (Indians), while the number of white female graduates decreased from 18 in 2004 to 15 in 2005. It can be said, therefore, that by 2005 there were twice as many white female PhD graduates as all the black PhD graduates combined. The number of white male PhD graduates was more than four times the number of black PhD graduates by 2005. This speaks volumes about the profile of academics, researchers and professors that South Africa is still producing for the future. The doctoral statistics do not signal much hope for transformation in the supply of future expertise in the BCM field, whether of academics, researchers or senior managers with MBAs and PhDs.

In the next section of the chapter we move on to consider the demand for managers, as far as the available data make it possible to assess this.

Demand for managers

To begin with, it needs to be pointed out that being 'in demand' does not equate to the existence of a shortage, because it may be the case that the demand could be more than met by available

skills. Nevertheless, one is unlikely to find a skill that is 'scarce' or 'critical' which is not in demand (it is the demand that creates the scarcity). The 'shortage' comes into being when demand is not met by supply.

The demand analysis below is based on advertisements by employers in a major newspaper, the *Sunday Times (Business Times* section). Over the three-year period 2004–2007, the Department of Labour (DoL) captured advertisements in this newspaper by employers seeking to recruit managers, and compiled these in a Job Opportunities Index (JOI) (DoL 2007a). The JOI classified vacancies according to the Organising Framework of Occupations (OFO), which ranks occupations from managers (at the top), through the categories professionals, technicians and trade workers, to elementary workers at the bottom of the scale. Each of these categories is then defined in detail. Table 3.2 summarises the findings of the 2004–2007 JOI with respect to the category 'managers'.

Needless to say, not all employers advertise their posts, and if they do so, they do not necessarily advertise in the *Sunday Times*. However, given that the *Sunday Times Business Times* is a significant medium for national job advertising, it is reasonable to expect that the larger employers (who are most likely to be in need of managers) will advertise there. This also means that the data provided by the JOI reflect the managerial demands of national or multinational employers rather than smaller, regionally based firms, in the main.

Table 3.3 summarises the outcome of this analysis. Among others, the following observations can be made:

TABLE 3.2: *Main areas of demand for managers (N) according to JOI, April 2004–March 2007*

Types of managers	2004/05	2005/06	2006/07	Total vacancies	Average growth rate 2004–2007 (%)
Chief executives, general managers and legislators	5 761	5 162	9 411	20 334	35.8
% growth		–10.4	+82		
Specialist managers	2 927	6 003	5 059	13 989	44.6
% growth		+105	–15.7		
Events, hospitality, retail and service managers	153	162	183	498	9.35
% growth		+5.8	+12.9		
Farm managers	16	8	15	39	18.75
% growth		–50	+ 87.5		
All managers	8 857	11 335	14 668	34 860	28
% growth		+27	+29		
Professionals (for purposes of comparison only)	*14 109*	*20 718*	*23 184*	*58 011*	*29.5%*
% growth		*+47*	*+12*		

Source: Erasmus 2008, compiled from data in DoL 2007a

TABLE 3.3: *Summary of main areas of demand for managers in the JOI, April 2004–March 2007*

Types of managers	2004/05	2005/06	2006/07	Total vacancies	Average growth rate 2004–2007 (%)
Chief executives, general managers & legislators	5 761	5 162 (–10.4% decline)	9 411 (82% growth)	20 334	35.8
Specialist managers	2 927	6 003 (105% growth)	5 059 (–15.7% decline)	13 989	44.6
Events, hospitality, retail and service managers	153	162 (5.8% growth)	183 (12.9% growth)	498	9.35
Farm managers	16	8 (–50% decline)	15 (87.5% growth)	39	18.75
All managers (34 860 vacancies)	8 857	11 335 (27% growth)	14 668 (29% growth)	34 860	28
Professionals (for comparison only)					
(58 011 vacancies)	*14 109*	*20 718*	*23 184*	*58 011*	
		(47% growth)	*(12% growth)*		*29.5*

Source: Erasmus 2008

1 Half of all the classified/ analysed advertisements (58 011 out of 113 767 or 50.99 per cent) were for professionals – the highest demand. Although these are not necessarily 'managers', it was noted earlier that many 'professionals', such as engineers and accountants, actually act as managers. It is also from this category of employees that many of the managers of the future may emerge. It is therefore of interest to note that the demand for professionals grew at almost exactly the same rate as that for managers from 2004 to 2007 (an average 29.5 per cent growth rate over the 3-year period, similar to the management vacancies' growth rate of 28 per cent).
2 The total number of advertisements for 'managers' was 34 860, which constitutes 60 per cent of the vacancies for professionals. There was a steady and upward growth in the demand for managers over the period 2004–2007.

An interesting dynamic can be observed in the interaction between the top management level, 'chief executives, general managers and legislators', and the 'specialist managers' level. The former are greater in number (145 per cent) than the latter. In the 2005/2006 year, there was a rapid growth in the demand for 'specialist managers' and advertisements for this category doubled from the previous year. This meant that the demand for 'specialist managers' was almost equal in number to that for 'chief executives; general managers and legislators' (6 003 for the former versus 5 162 for the latter). However, in 2006/2007, the demand for the 'chief executives' category, 'shot through the roof', jumping by 82 per cent to 9 411, while there was a slight decline in the vacancies for 'specialist managers'

(registering a 15.7 per cent dip). This could indicate some 'displacement effect' between the two levels, whereby a rapid demand for one has a negative effect on the demand for the other. Put simply, the above observation could be interpreted to mean that companies filled up vacancies for 'specialist managers' in 2005/2006 and then shifted upwards, to focus on higher levels in 2006/2007. This would need a detailed study of its own to be verified empirically. The main point, though, is that these variations illustrate the complex interaction between the various 'occupations' in the private sector. This makes it difficult, if not meaningless, to draw clear lines between 'professionals' and 'specialist managers' and between the latter and 'chief executives, managing directors and general managers'. One 'level' or occupation could be a mere 'two years' promotion difference' from the other, rather than a matter of 'skill'.

Revisiting the question of management skills shortages

As was argued earlier in this chapter, there is no scientific method of working out the exact quantity of skills that are 'scarce', as this involves a range of variables some of which are exogenous to the sector or industry concerned. One of the indicators that is used by the HSRC is the 'fill rate'. The fill rate is used by the New Zealand Department of Labour (2005) with some reservations and many caveats. It simply refers to the number of vacancies that are filled by employers after they had been advertised. To work out the fill rate, a number of employers are interviewed/surveyed to determine the percentage of vacancies that were filled, over a specific period of time, on the assumption (which can be challenged) that those vacancies that were not filled must be for positions/occupations that are 'scarce'. The New Zealand Department of Labour (2005: 1) views occupations that have a fill rate lower than 80 per cent as being in short supply. This evidence is normally derived from interviews with at least 10 employers per respective occupation (Infometrics Ltd 2006).

The HSRC conducted a short questionnaire survey among employers who had recently advertised vacancies in the *Sunday Times* in 2007 (Erasmus 2008). A total of 1 107 employers were interviewed concerning vacancies across the first six major occupational groups of the OFO. Major occupational groups in which a fill rate of lower than 80 per cent was recorded were technicians and trades workers (48.72 per cent) and professionals (77.40 per cent). 'Managers' recorded the highest fill rates, at 95.15 per cent, along with community workers and personal service workers (99.33 per cent), as well as clerical and administrative workers (95.94 per cent). However, the 'sub-major' group-level fill rates examined in the HSRC survey reveal that some shortages may exist for certain managerial occupations. Those managerial occupations with the lowest fill rates are chief executives and managing directors (enterprises/organisations); engineering project managers; construction managers; production/operations managers; contract, programme and project managers and information and communication (ICT) technology managers (Erasmus 2008). As the HSRC survey cautions, the veracity of the 'fill rate' indicator may be in question. Only 17 vacancies for chief executives and managing directors were involved in the survey, of which 12 were filled, resulting in a fill rate of 70.59 per cent (which is technically below the 80 per cent threshold, thus rendering the positions 'scarce'). The HSRC survey also highlights another factor which raises doubts about the usefulness of the fill rate statistic. It notes that in spite of the fact that vacancies for 'head of local office' recorded fill rates of below 80 per cent, the related employers did not regard the occupation as being short of skilled people. So, the mere inability on the part of employers to fill certain posts (or even a decision not to do so) is, of itself, not an indicator of shortage.

From the above analysis, as well as the HSRC questionnaire survey results (Erasmus 2008), the following categories of manager could be identified as 'being in short supply':

- Chief executives and managing directors (enterprises/organisations) – this group had a fill rate of 70.59 per cent, as noted above, and it also measured constant year-on-year growth. It also had an

r-squared value well above the 90 per cent confidence level, which indicates that an increase in the number of advertised vacancies may continue in 2008.

- Statistically, 'head of local office' posts had the lowest fill rate (60.61 per cent – 40 out of 66 vacancies were filled) and yet the employers interviewed by the HSRC did not regard the occupation as experiencing a shortage of skills. Maybe the conditions of employment and/or the levels of the posts are not attractive to prospective employees, given the demands. This would highlight the endogenous aspects of the definition of scarcity, by which a shortage that is due to 'job-related' or 'environment-related' factors (as opposed to actual lack of supply) is not tantamount to a 'scarce skills' situation. There is also a subjective element involved, or 'relative scarcity' in terms of the National Scarce Skills List definitions (DoL 2007b; NSA 2007).
- In terms of fill rates, none of the occupations in the business administration manager group (including financial managers) can be regarded as experiencing a shortage. Being in demand is not tantamount to a shortage (if the demand is easily matched by suitable supply!).
- Contract, programme and project managers can be regarded as being in short supply (with a vacancy fill rate of 61.22 per cent). According to the HSRC survey, this category showed the strongest growth (312.25 per cent) in advertised vacancies for managers over the 3 years under review.
- ICT managers recorded the lowest fill rate (42.86 per cent) and can be regarded as being in short supply.

These are the areas of shortage as far as the HSRC data analyses are concerned. They ought to be seen in conjunction with the National Scarce Skills List of the DoL (2007b). According to this list, points are allocated to indicate the 'Magnitude of Scarcity' (MOS) for each occupation/ sub-occupation. In terms of the MOS, the most scarce category of managers in the country is 'crop farmers/ managers' (MOS = 102 670), including crop farm workers (MOS=180 000). A 'mixed crop and livestock' farmer (or 'farm manager') has an MOS of 150 000. This MOS is staggering, considering that chief executive officers have an MOS of 420. General managers have an MOS of 13 525. Within the sub-group of 'specialist managers', it is the 'advertising, marketing and sales' managers who seem to be in greatest demand, given the supply (MOS of 5 045). This is not corroborated by the findings of other surveys, for example, the DoL's own JOI for 2004–2007 (DoL 2007a). The above analyses of these surveys indicated a rise in the demand for business administration managers, including small business, office, programme and project managers, and a decline in demand for advertising, marketing and sales managers. The MOS of 5 045 given to the latter in the National Scarce Skills List is much higher than that of 'finance managers' (3 975), human resources managers (1 215), construction managers (3 875) and engineering managers (3 570) (DoL 2007b).

If the DoL's National Scarce Skills List is used for career planning by students and/or for re-focusing programmes offered by FET and HET institutions, then students should seriously consider a career as 'handyperson' (with an MOS of 19 000), 'welfare support worker' (19 995), 'further education and training teacher' (24 015) or 'early childhood teacher' (6 695) The above professions have a far higher MOS than 'higher education lecturers' (5 300), not to mention 'mining engineers' (780), 'economists' (250), 'actuaries, mathematicians and statisticians' (170) and 'accountants' (3 655). Be that as it may, the National Scarce Skills List, controversial as it may be, will at least introduce some objectively verifiable basis for engaging with the issue of scarce skills.

It is important, however for the supply to be matched to demand, otherwise we will see-saw between over- and under-supply. In relation to the question of management skills supply, the JOI, read in conjunction with the National Scarce Skills List, should give a better indication of the necessary areas of focus, which will help to shape career-pathing, curriculum renewal at higher education level and the focus of business school courses. A more structured form of engagement with the human capital needs of the country is required, to enable forward planning among all the key role players. Any short-term responses and crisis management strategies should be avoided if we are to place the country on a long-

term economic and human capital growth path. We need to aim for a state in which the rate of human capital accumulation approximates the rate of physical capital accumulation, otherwise known as the 'Human Capital Convergence Parameter' (Kosempel 2004) or the 'complementarity hypothesis' (Mincer 1993). This can only be achieved with serious planning and multiple-stakeholder participation.

Over the past 15 years, the post-apartheid government has passed a number of laws that are meant to deal with the legacy of racial discrimination (see for example Gqubule 2006; Jack 2007; Terreblanche 2002). The Broad-Based Black Economic Empowerment (BBBEE) Strategy and Policy is the latest amongst these interventions (Gqubule 2006; Jack 2007). Yet, the BBBEE legislation, which was passed in 2003 and whose accompanying Codes of Good Practice were enacted in 2007 (DTI 2007), is only the tip of an iceberg of policy and legislative measures. As long ago as 1998, the government passed the Employment Equity Act (No. 55 of 1998) as well as the Skills Development Act (No. 97 of 1998). So, employers have had 10 years in which to really focus on the development of their employees' skills and to de-racialise their professional and management levels. If this was done in the spirit of reconciliation, nation-building and economic reconstruction which prevailed in the late 1990s, then we should be reaping the rewards of these interventions by now. But, alas, the findings presented in the next section paint the opposite picture.

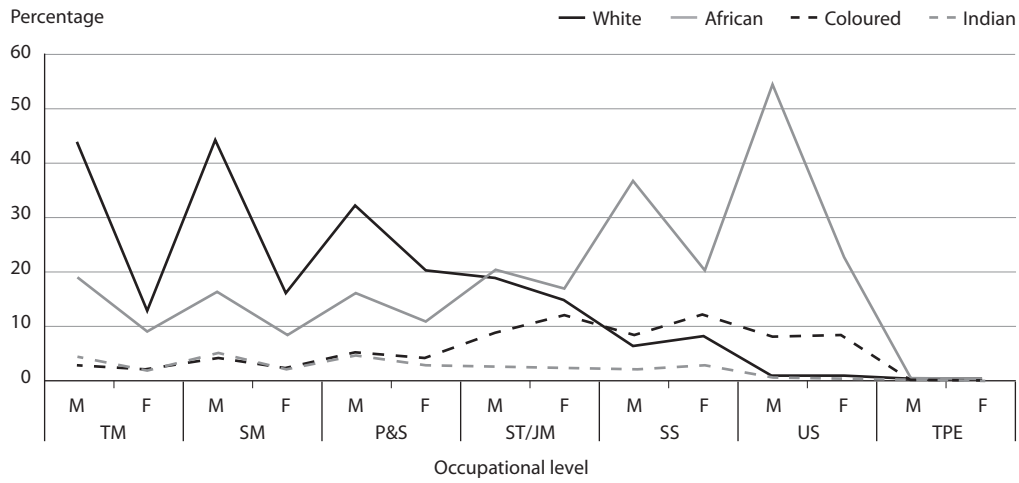
Employment equity and skills development progress by employers

The graphs presented in Figures 3.6–3.10 were compiled from the reports of the Commission for Employment Equity (CEE) (CEE 2002–2007). They summarise the trends in recruitment, promotion, training and development by race and gender during the period 2000–2006. They also summarise the current profile of managers at senior and top levels, by race and gender.

The statistics on employment equity and skills development trends in South Africa between 2000 and 2005 presented in Figures 3.6–3.10 demonstrate a lack of substantive progress in the reversal of white domination at the middle- to top-management levels. Most of the findings are contrary to what one would expect after some 10 years of employment equity and skills development legislation, both of which were enacted in 1998. Closer scrutiny of the data from the various CEE reports (2002–2007) reveals inconsistencies between the levels at which employers are focusing their skills training and the levels that need training most. Most of the training is targeted at the elementary levels, where skills development is least needed, and not so much at professional and middle management levels, which is where the supply of senior managers is likely to come from. This raises concerns that most employers may simply be playing the numbers game, training *en masse* at low levels where there are high volumes and therefore higher skills development levy rebates.

This hypothesis is also reinforced by the virtual lack of any movement in the percentage of black people (both male and female) at professional and senior management levels (between 2000 and 2005). In fact, a greater percentage of white men seem to have been appointed to middle management during this period than black people. This calls into question the real commitment of the current cadre of corporate leaders to providing equal opportunities to all the citizens of South Africa. Unfortunately, the statistics seem to support the notion that business will only make serious transformational changes if forced to do so by other stakeholders, particularly where such stakeholders have serious leverage (such as access to procurement, power to impose fines for non-compliance, capacity for shareholder activism, etc.). In relation to the concerns of this study, the findings on employment practices with respect to the actual skills training, promotion and development of employees are an indictment of employers; it is clear that they are certainly not 'coming to the party' with respect to moving the country away from its past of white privilege, towards a truly non-racial future in which diversity and equity are the rule. This failure also has negative implications for national attempts to develop skills. The statistics seem

FIGURE 3.6: *Distribution of recruitment, by race and gender, 2005–2006*



Source: CEE 2006: 34, Table 8

Notes: TM = Top management
SM = Senior management
P&S = Professionally qualified and experienced specialists and mid-management
ST/JM = Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents
SS = Semi-skilled and discretionary decision-making
US = Unskilled and defined decision-making
TPE = Total permanent
N = 930, includes all races, male and female, only in South Africa

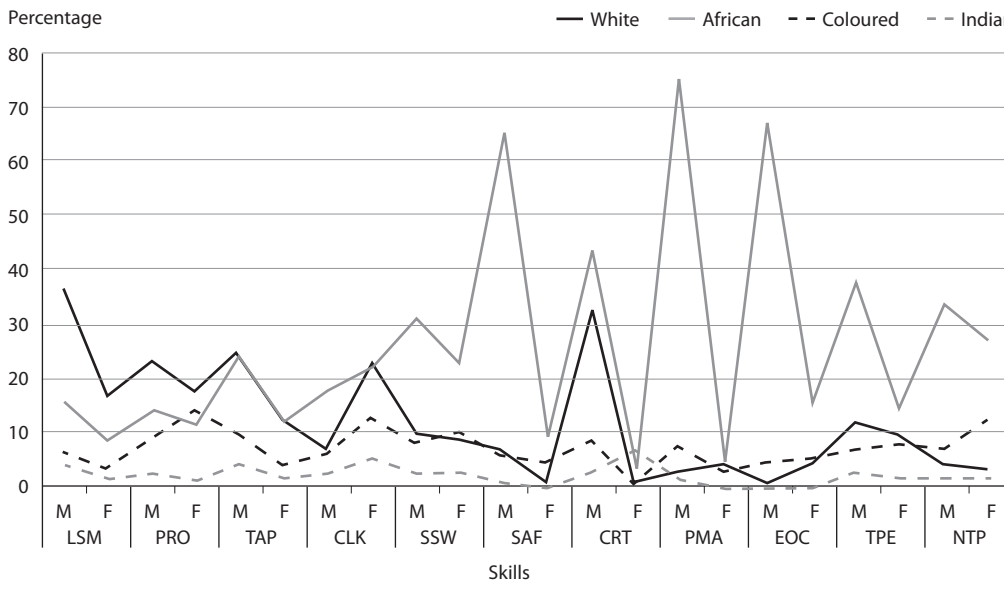
to corroborate concerns that solutions which focus on the recruitment of foreign skills are sending the wrong signal to employers, namely, that they can continue to disinvest in their own employees and that the solution lies elsewhere.

Conclusion

A number of recommendations may be made by way of concluding this analysis of management skill demand and supply. Firstly, as has been argued in this chapter, the management profession in South Africa ought to be regulated. There have been too many disasters in which 'managers' have gotten away with murder, globally and even locally. The role carries too many responsibilities, and too many stakeholders are affected, for these highly-paid professionals not be held accountable for their actions.

The regulation of the profession should be accompanied by all the necessary measures that distinguish other high-level professions, such as law, accounting and medicine. These should include the creation of one national professional body to which all managers must belong, with a disciplinary code and committee, and a code of ethics to which all professional members will be legally bound. Managers should also be sworn to oath, in the same manner as medical practitioners. The professional body should have the power to standardise entry into the profession. The proliferation of diplomas and certificates in BCM studies should be phased out through the setting of clear entry requirements for

FIGURE 3.7: *Distribution of skills development, by race and gender, 2005–2006*



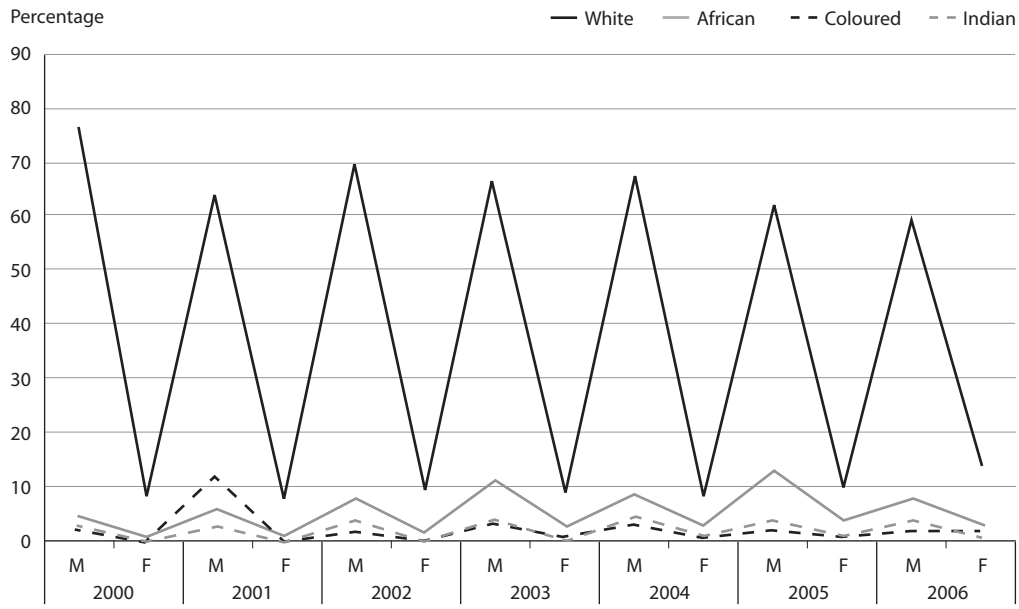
Source: CEE 2006: 50, Table15

Notes: N = 1 532 207, includes all races, male and female
LSM = Legislators, senior officials and managers
PRO = Professionals
TAP = Technicians and associate professionals
CLK = Clerks
SSW = Sales and service workers
SAF = Skilled agricultural and fishery workers
CRT = Craft and related trade workers
PMA = Plant and machine operators and assemblers
EOC = Elementary occupations
TPE = Total permanent employees
NTP = Non-permanent employees

junior management. The Postgraduate Diploma in Business Management should be standardised, in terms of its curriculum content, and it should be made the compulsory entry qualification, in addition to the measures noted above. The MBA should also be given official recognition as the requirement for entry into 'senior management', in the same way in which chartered accountants obtain the CTA qualification after graduating with a bachelor's degree. Part of the professionalisation process should include the structuring of career paths for managers, with components such as internships, etc. Other components such as community service should also be considered, so that the concept of 'community trusteeship' among managers does not remain merely a form of academic jargon.

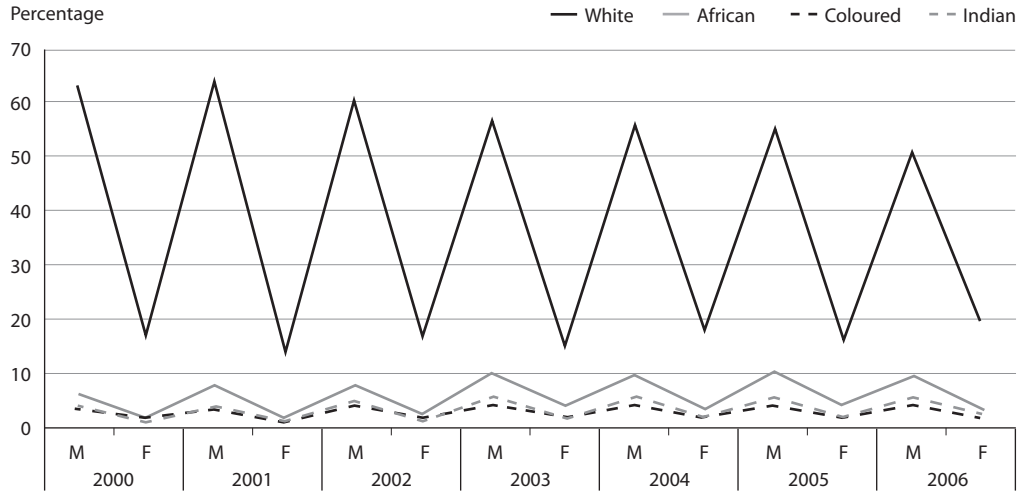
Besides issues of professionalisation, which business schools and other professional management bodies ought to pursue together with government stakeholders (such as the Departments of Education, Labour, etc.), there is a second set of issues related to 'scarce skills' on which business and non-governmental organisations ought to engage the DoL as well as the Department of Home Affairs. The skills that appear jointly in the JOI (DoL 2007a) as well as in the National Scarce Skills List (DoL 2007b) under the heading 'management' do not appear to be skills that would be best addressed via a wide-scale and 'open door' approach to immigration. The category 'advertising, marketing and sales', for example, requires a sound knowledge of the market involved, including its culture, consumer preferences and other nuances. Since this has the highest MOS on the Scarce Skills List, one cannot

FIGURE 3.8: *Changes at top management level, by race and gender, 2000–2006*



Source: CEE 2006: 56, Table17

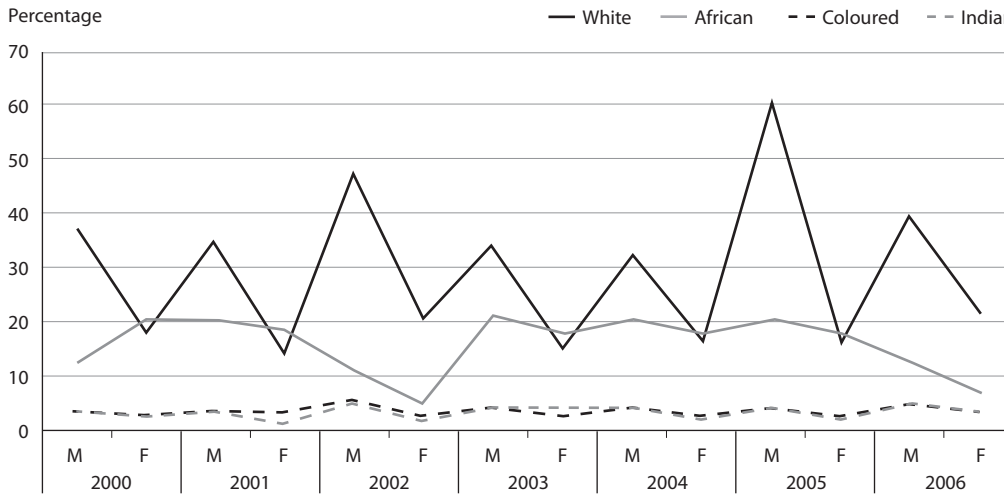
FIGURE 3.9: *Changes at senior management level, by race and gender, 2000–2006*



Source: CEE 2006: 57, Table18

envisage companies recruiting hundreds of advertising, marketing and sales managers from China, India, other African countries or Europe. Nor are we going to get more crop farm managers and/or livestock farm managers via exogenous means. The shortages of managers in these two occupations (which appear very high in the Scarce Skills List) can also not be attributed to 'bantu education' or to the poor mathematics and science scores of black high school learners. Black people have been in the

FIGURE 3.10: *Changes at professionally-qualified level, by race and gender, 2000–2006*



Source: CEE 2006: 58, Table19

advertising, marketing and sales industry for some decades now. We have even had black-owned and -managed marketing companies (such as Dr Reuel Khoza's Co-ordinated Network Marketing, Peter Vundla's Herdbuoys, etc.). Saatchi and Saatchi (as it was then called) already had a black managing director (Mpho Makwana) some 10 years ago. The same could be said for 'crop and livestock farmers'. These are not rocket scientists or Harvard MBA-graduates. It is a question of the stakeholders in the sectors concerned making the long-overdue decision to transform their industries and to really start developing skills among all South Africans. Incidentally, in terms of employment equity and transformation, the advertising, marketing and sales industry as well as the farming industry have been found wanting in many respects, particularly within the framework of the BBBEE debate. So there seems to be a correlation between the 'Magnitude of Scarcity' that is noted in the DoL's National Scarce Skills List and the 'Magnitude of Transformation' that can be observed in the occupation or industry sector concerned. This is a matter that requires further attention and more study, as we get down to the nitty-gritty of this supposed skills 'crisis'.

As argued earlier, employers are not coming to the party with respect to the development of skills. The same 'malicious compliance' also seems to have been adopted with respect to employment equity. This basically means that after 10 years of employment equity and skills development initiatives, nothing of strategic value has been done in this regard. If this were not the case, we would not be talking of a 'skills crisis' in the first place. Not only is this an indictment of the highly paid 'HR' managers, who waste no time in changing their titles to reflect the latest and most advanced 'fad' (for example, 'Human Capital Development Managers', of late) but also of their principals, the CEOs. No company would come to the government, with its hands in the air, and claim that it had not developed its machinery for the past 20 years and that it needed help to import the equipment, which the government must provide. Yet everyone seems to be saying this about what is supposed to be the companies' greatest 'assets', their people. We need to import them *en masse* because we just cannot find the people with the right skills and the right experience! While we are no longer allowed to invoke apartheid in any other context as an excuse for failure to solve problems, in the context of the 'skills shortage' debate it seems quite acceptable to blame this on apartheid, on bantu education, on the lack of mathematics and science among blacks, and on. There is a serious failure of leadership here, and 'management' once again has

really failed to 'manage'. With the necessary transformational leadership, and the involvement of all key stakeholders, South Africa should be able to develop its own critical and scarce skills, as Malaysia and India did, not so long ago.

References

Bhorat H (2004) Labour market challenges for the post-apartheid South Africa. *South African Journal of Economics* 72(5): 940–978

Borgelt K & Falk I (2007) The leadership/management conundrum: Innovation or risk management? *Leadership & Organisation Development Journal* 28(2): 122–136

Cabrera A & Bowen D (2005) Professionalizing global management for the twenty-first century. *Journal of Management Development* 24(9): 791–806

CDE (Centre for Development and Enterprise) (2007) *Focus report on the South African skills crisis: A report from the corporate coalface*. Johannesburg: CDE

CEE (Commission for Employment Equity) (2002–2007) *Annual reports.* Pretoria: DoL

CHE (Council on Higher Education) (2004) The state of the provision of the MBA in South Africa. *Higher Education Monitor*. Pretoria: CHE

DoE (Department of Education, South Africa) (2006) *Education statistics in South Africa at a glance 2005*. Pretoria: DoE

DoL (Department of Labour, South Africa) (2007a) *Job opportunity index 2004–2007*. Pretoria: DoL

DoL (2007b) *National scarce skills list*. Accessed 15 December 2007, http://www.labour.gov.za

DoL (2007c) *Women in the South African labour market: 1995–2005*. Pretoria: DoL

Doh J (2003) Can leadership be taught? Perspectives from management educators. *Academy of Management Learning and Education* 2(1): 54–67

DTI (Department of Trade & Industry, South Africa) (2007) *Code series 200, 300 and 400. Broad-based black economic empowerment codes of good practice.* Government codes of good practice. Pretoria: DTI

Elmuti D (2004) Can management be taught? If so, what should management education curricula include and how should the process be approached? *Management Decision* 42(3/4): 439–453

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

Gqubule D (2006) *Making mistakes, righting wrongs: Insights into black economic empowerment*. Johannesburg: Jonathan Ball Publishers

Holian R (2004) The practice of management education in Australian universities. *Management Decision* 42(3/4): 396–405

Infometrics Ltd (2006) *Indicators of skill shortage*. Accessed 14 November 2007, http://www.dol.govt.nz/ PDFs/ skill-Shortage-indicator-report.pdf

Jack V (2007) *Broad-based BEE. The complete guide.* Northcliff, South Africa: Frontrunner Publishing

Khurana R, Nohria N & Penrice D (2005a) *Working knowledge for business leaders.* Harvard Business School, February 21. Accessed 14 May 2007, hbs.edu/item/4650.html

Khurana R, Nohria N & Penrice D (2005b) Management as a profession. In JW Lorsch, L Berlowitz & A Zelleke (eds) *Restoring trust in American business*. Cambridge, MA: MIT Press

Kosempel S (2004) A theory of development and long run growth. *Journal of Development Economics* 75: 201–220

Mincer J (1993) *Studies in human capital: Collected essays of Jacob Mincer* Vol. 1. Aldershot, UK: Edward Elgar Publishing Limited

Mintzberg H (1971) Management work: Analysis from observation. *Management Science* 18(2): B97–110

Mintzberg H (1996) Musings on management: Ten ideas designed to rile everyone who cares about management. *Harvard Business Review* 7(4): 61–67

NSA (National Skills Authority)(2007) *Briefing paper on scarce and critical skills*. Commissioned by the Department of Labour and German Technical Co-Operation (GTZ). Paper presented at the National Skills Authority Skills Colloquium, 3–4 May 2007, Kopanong Hotel and Conference Centre, Benoni

New Zealand Department of Labour (2005) *Skills shortages in New Zealand: Key findings from the Survey of Employers who have Recently Advertised 2005*. Accessed 23 August 2006, http://www.Dol.govt.nz/PDFs/sera-key-findings.pdf

Quantec (2007) *RSA regional indicators*. Accessed September 2007, www.quantec.co.za

Robbins SP (2001) *Organisational behaviour*. New Jersey: Prentice-Hall

Spender JC (2005) Speaking about management education: Some history of the search for academic legitimacy and the ownership and control of management knowledge. *Management Decision* 48(10): 1282–1292

Terreblanche S (2002) *A History of inequality in South Africa 1652–2002*. Pietermaritzburg: University Of Natal Press & KMM Review Publishing

Thomas M (2006) Management: A profession in theory. *Management Decision* 44(3): 309–315

Trank CQ & Rynes SL (2003) Who moved our cheese? Reclaiming professionalism in business education. *Academy of Management Learning & Education* 2(2): 189–206

Van der Colff L (2004) A new paradigm for business education: The role of the business educator and business school. *Management Decision* 42(3/4): 499–507

CHAPTER 4

Social workers

Nicci Earle-Malleson

Introduction

The constraint of high-level skills shortages within the South African labour market is considered by government to be a key obstacle to achieving its target of a six per cent economic growth rate. In support of the challenges to address skills shortages, the vision of the National Skills Development Strategy (NSDS) for the period 1 April 2005–1 March 2010 is to develop 'skills for sustainable growth, development and equity' (DoL 2005). Through Objective 1 of the NSDS, the Department of Labour (DoL) commits itself and the Sector Education and Training Authorities (SETAs) to 'prioritise and communicate critical skills'. To this end, the DoL commissioned the Human Sciences Research Council (HSRC) to undertake research to ascertain the nature of a range of scarce and critical skills in South Africa. Among these is the profession of social work.

The aim of the research on social work presented in this chapter was firstly to determine from whom the claims of social worker skills shortages were coming, and in what terms these shortages were being quantified. Primary data analysis and examination of various available sources of information to either support or refute public claims and to provide a clearer quantitative picture of shortages, should they exist, constituted the second step. Yet skills shortages cannot be separated from the context of their professional and educational milieux, or from the broader skills development and labour market environments of the country. Thus, having determined in as much detail as possible the nature of social worker shortages, the chapter discusses the qualitative context of the current skills crisis. Finally, taking both the quantitative and qualitative information into account, this report concludes by outlining the absolute and relative nature of the shortage of social workers in South Africa, before highlighting the three key recommendations, out of the range emerging from other research, in which the DoL's involvement is likely to be most critical for successful implementation.

The President of South Africa, Thabo Mbeki, in his State of the Nation Address of 9 February 2007, argued that there is a critical need to '[a]ccelerate the training of Family Social Workers at professional and auxiliary levels' if government's other social (and economic) programmes are to be implemented effectively (Mbeki 2007). This statement follows earlier admissions (DSD 2005c: 4) that in relation to the welfare policies that aim to address the national priority issues of poverty, unemployment, and HIV and AIDS, 'there is a lack of capacity to implement these policies and programmes due to, amongst others, the overwhelming demand for services and the inability to cope with such demands. This is particularly true for social workers who are at the coalface of delivery to the poorest and most vulnerable sectors of society.' These statements represent high-level acknowledgement of claims of social worker shortages over the past five years coming from the media as well as the academy.

References to the exact nature of these shortages are limited outside of a few key in-depth research documents focusing on particular aspects of service delivery. Within the realm of general public sources, however, suggestions are that the current pool of social workers (around 11 000) is insufficient to meet demands and to fill vacancies, and that a figure in the region of 16 000 represents the number required by the Department of Social Development (DSD) alone.

Quantifying the shortages of social workers

In attempting to quantify the shortages of social workers in South Africa, a number of key questions were asked:

- How many social workers do we have in the South African labour market?
- What is the distribution of available social workers?
- What are the demographics of available social workers?
- How many social workers do we need?
- What does the supply line of social workers look like?
- How is supply matching up to demand?

Information sources utilised in trying to answer these questions adequately include the following:

- the statutory regulatory body of the profession, the South African Council of Social Service Professions (SACSSP 2005)
- the Department of Education's (DoE) Higher Education Management Information System (HEMIS) (DoE 2007)
- the Department of Public Service Administration's (DPSA) Personnel and Salary Information System (PERSAL) database (DPSA 2005)
- Statistics South Africa's (Stats SA) data on occupational migration (Stats SA 1989, 1991, 1993, 1996, 1999, 2000a, 2000b)
- Stats SA's October Household Survey (OHS) (1996–1999) (obtained via Quantec 2007)
- Stats SA's Labour Force Survey (LFS) (2000–2005) (obtained via Quantec 2007)
- Stats SA's Census 2001 (Stats SA 2003)
- social worker professional societies (Earle 2007)
- the DSD (DSD 2005a, 2005b, 2005c, 2005d, 2005e, 2006, 2007)
- the National Coalition of Social Services (NACOSS 2007)
- the *Sunday Times Business Times* 'Career Times' supplements of job advertisements (April 2004–March 2007) (Erasmus 2008)
- the UK's General Social Care Council (GSCC 2005, 2007)
- the Work Permits (UK) Freedom of Information Division (2007) of the British Home Office
- the South African Qualifications Authority (SAQA) publication of graduate output (SAQA 2004)
- the Bureau of Market Research projection of national and provincial populations (Van Aardt 2004).

These various sources provide the information discussed below regarding the questions listed at the start of this section.

How many social workers do we have in the South African labour market?

In October 2005, a total of 11 111 social workers were registered with the SACSSP. From a figure of 9 711 in 1996, this represents an annual increase of only 1.5 per cent over the 9-year period. This growth in the number of registered social workers was, however, not consistent over the period, with evidence of growing annual numbers of social worker de-registrations up to 1999 (the last year for which these data were collected). Thus, despite legal requirements that all practising social workers be

registered with the SACSSP, Council representatives have indicated that their figures are not a wholly accurate reflection of the numbers of social workers practising within South Africa. The reasons for this include the fact that some social workers are registered as 'non-practising'; some of those who are registered as 'practising' are in fact not practising social work, or not practising it in South Africa; and some qualified but unregistered social workers are indeed practising in social work-related occupations within the country. Thus, while the SACSSP data provide the best available information on the numbers of social workers within the South African labour market, examining other data sources for additional information is valuable.

Using data from the OHS, LFS, PERSAL, Census 2001 and NACOSS sources over the years for which they are available and comparing them with SACSSP data suggests, firstly, that at any given time, fewer social workers are active within the South African labour market than are registered to practise with the SACSSP; and secondly, that over the period 1996–2005, social worker participation in the labour market did not increase consistently, but rather decreased somewhat between the beginning of the period and roughly 1999/2000, before increasing again to the figures evident for 2005. Thus these data sources, which suggest a range of between 8 578 and 12 685 social workers active within the South African labour market in 2005, roughly support the SACSSP figures.

What is the distribution of available social workers?

From a major economic sectoral perspective, almost all social workers fall into the 'community, social and personal services' sector. Within this, however, Census 2001 data indicate that roughly half are involved in 'social work activities' (48.4 per cent), one-quarter are involved in 'central government activities' (25.4 per cent) and just over one-tenth (11.4 per cent) in 'human health activities' (Stats SA 2003). Available data on distribution from an employer perspective suggest that 45.7 per cent are employed by either the state or the private welfare sector and 11.7 per cent by other state departments, while 11.4 per cent are self-employed. The Department of Correctional Services (65 per cent) and the South African Police Service (SAPS) (3.1 per cent) dominate national-level state employment of social workers (Earle 2007).

In respect of their geographical distribution, data from both the SACSSP and the DSD provide information. In real terms Gauteng has the largest number of social workers (3 158), followed by the Western Cape (2 292) and KwaZulu-Natal (1 694), while Mpumalanga (394) and the Northern Cape (330) have the fewest. When comparing actual numbers of social workers (SACSSP 2005) against provincial populations (Van Aardt 2004), a somewhat different picture emerges: the Western Cape is the most advantaged, with 49.9 social workers per 100 000 of the population, followed by Gauteng (35.0) and the Northern Cape (32.7). Mpumalanga, Limpopo and North West are most disadvantaged with figures of 12.6, 12.7 and 13.4 respectively.

However, due to the fact that not all social workers within a province may be working, or indeed working in welfare-related occupations, a better indicator of skills distribution, in respect of human resources available to serve the welfare needs of the nation, is the distribution of social workers employed in formal direct welfare (DSD 2005a) relative to every 100 000 of provincial populations (Van Aardt 2005). In these terms, the Northern Cape and Western Cape are most advantaged with figures of 20.4 and 15.7 respectively. North West, Limpopo and Mpumalanga are most disadvantaged with figures of 7.7, 8.2 and 8.2 respectively. Clearly, the distribution of social workers, particularly in respect of those involved in formal direct welfare activities, is uneven, with poor rural provinces most negatively affected.

What are the demographics of available social workers?

From a gender perspective, SACSSP data reveal that social workers are overwhelmingly female and that the proportional breakdown has remained fairly consistent over the period 1996–2005. The largest annual proportion of women is 89.3 per cent in 2005, while the smallest is 86.9 per cent in 1996 (SACSSP 2005). These proportions are supported by the other data sources.

Racially, data are less reliable and do not allow for trend analysis over the period. However, the overall picture emerging from OHS and LFS data suggests that Africans are on average the largest group (48.9 per cent), with white people the second-largest group (32.1 per cent). The average number of coloured people involved in the social work and social work associate professions is also almost three times (13.9 per cent) the number of Indian people (5.0 per cent) (Quantec 2007). Census 2001 provides some confirmation of this picture, with figures of 50.1 per cent for Africans, 35.6 per cent for white people, 9.4 per cent for coloured people and 4.9 per cent for Indians (Stats SA 2003). These proportions are not yet representative of the broader population of South Africa, but considering the fact that social work education was focused predominantly on white students prior to 1994, they represent significant strides in demographic transformation.

The majority of social workers active within the labour market are between the ages of 25 and 34 years. OHS data put this proportion at 45.6 per cent and LFS data at 58.8 per cent. As only a small proportion of these professionals enter the labour market prior to the age of 25 (2.4 per cent according to the LFS and 5.5 per cent according to the OHS), this period represents the first 10 years of professional work for most social workers (Quantec 2007). The considerably smaller proportion of social workers older than 35 years raises serious questions about the retention of social workers within the profession. Cross-tabulation of race with age provides some evidence of the changing demographics of professional social workers that is not possible to obtain from demographic information alone: while the majority over the age of 45 are white, between the ages of 25 and 44 only roughly 30 per cent are white.

Finally, analysis of social workers in government employ (using the PERSAL database) indicates that this group of individuals is representative of the overall group of social work skills in respect of gender, but not in respect of race. Africans, at 73.2 per cent, are over-represented compared with the total pool of social work skills, while whites at 12.3 per cent and Indians at 2.6 per cent are under-represented (DPSA 2005).

How many social workers do we need?

Determination of the number of social workers needed, in other words, quantifying the exact nature of the shortages of social workers in South Africa, is no easy task and needs to be considered at three different levels. At the most basic level, there is the demand created by the need to maintain current levels of social workers relative to the population. This consists of two key aspects: new demand to take account of population growth, and replacement demand to cover the requirements arising from social workers leaving the profession due to factors such as retirement, death or emigration. At this level, however, analysis considers only the maintenance of a proportionally consistent workforce at existing ratios.

At a second level, there is the demand created by the need to fill currently vacant social worker posts – a factor which, if addressed, would alter the current ratio of social workers to population. As a reflection of current 'market' demand, however, this is somewhat artificial as it reflects more accurately the demand created by the availability of funding for social work positions rather than the demand for services by the actual users, as these users are generally unable to pay for the services they require. Thus, finally, at the third level, it is important to analyse the demand for social workers arising out of

the need for their services. Here, comparisons of the actual availability against determined norms and standards provide the best information.

Working with the total pool of 11 111 registered social workers in 2005 (SACSSP 2005) against a population in that year of 47 004 745 (Van Aardt 2004), the overall ratio of social workers to population was 23.6 per 100 000. Taking a number of economic assumptions into account, by 2015, a total of 468 additional social workers will be needed to cover population growth, 874 will be required to cover losses due to retirement, and 1 967 will be needed to cover deaths among social workers (including mortality due to HIV/AIDS). Thus to maintain current ratios of social workers to population, a total of 3 282 new social workers will be required to enter the labour market by 2015.

Emigration is another factor impacting substantially on replacement demand of South African qualified social workers. This factor, however, does not lend itself to easy analysis as hard data on the emigration of social workers from South Africa are patchy. Available official data from Stats SA concerning self-declared emigration of people within the 'social service occupations' (Stats SA 1999, 2000a, 2000b) were compared with data obtained directly from other sources such as the UK General Social Care Council (GSCC 2005, 2007) and the UK Home Office's Work Permits, Freedom of Information Division (2007), as well as with direct research by other authors (e.g. Engelbrecht 2006). Together, these sources indicate that emigration from South Africa generally, but also specifically to the UK, increased dramatically from the year 2000 onwards compared with the previous decade, and that emigration to the UK reached a peak between 2002 and 2004, with indications that the magnitude of movement has reduced somewhat since then. Official South African statistics suggest that since 2000, South Africa has lost an average of 88 social workers per year to emigration; the UK data, however, suggest that losses of social workers to South Africa are more likely to be in the region of between 157 and 278 annually. Using the conservative figure of 1.02 per cent of registered social workers as the annual official proportion lost to emigration, South Africa will need 1 156 additional social workers by 2015 to cover the resulting demand.

The analyses outlined above, however, only consider demand in relation to the maintenance of the current ratio of social workers to population, and do not take into account whether the number of social workers within the local labour market is actually adequate to meet the demand for their skills, as created by existing funded positions.

Figures obtained from the DSD (DSD 2005b) and supplemented by the media[1] provide information on the number of vacancies in the public welfare sector in 2005. This shows that there are unfilled posts in all of the seven provinces for which there are data, as well as at the national level. The largest proportions of vacancies are in KwaZulu-Natal (52.1 per cent) and the Eastern Cape (51.0 per cent) provinces. Limpopo (9.4 per cent) and the Northern Cape (12.4 per cent) have the lowest levels of vacancies; however, figures even in these provinces are not insignificant. Worryingly, disaggregation of vacancies by salary levels shows that the largest proportion of vacancies (46.9 per cent) is also for the level of greatest demand – entry level 7.

The second source of information on vacancies for social workers was the *Business Times* 'Career Times' supplement of the *Sunday Times* national newspaper (Erasmus 2008). Over the period April 2004–March 2007, vacancies for social work and social work associate professions were captured and analysed, revealing a steady increase from a figure of 29 in the first quarter to a high of 397 for the quarter January–March 2006. Some reduction in advertising is apparent since then, although it remained at a high of 173 for the last quarter captured. In total, 2 632 advertisements for social work and social work

1 Chauke P, Social Worker Crisis Hits Poor, *The Herald* 21 February 2005

associate professionals were counted, and while this total cannot be related to the actual number of posts available, due to the fact that for many posts more than one advertisement was issued, the need for repeated advertising is in itself an indication of the inability of current supply to fully meet current demand.

Due to the cost of advertising in a national newspaper such as the *Sunday Times*, this source did not adequately reflect shortages within the under-funded NGO sector. NACOSS data collected directly for inclusion in this study, despite being incomplete, provide stark evidence of the impact of social worker shortages on this sector (NACOSS 2007). Annual staff turnover rates at the general social worker level increased from an already astronomical 38.8 per cent in 2005 to 40.4 per cent in 2006, while at supervisory and management levels, turnover for 2006 was 16.1 per cent and 16.9 per cent respectively. What emerges from these data as an additional concern for the equitable distribution of these scarce skills is the difficulty that NGOs, particularly in the rural provinces, have in recruiting and retaining these professionals. As an extreme example, Child Welfare South Africa[2] in Mpumalanga (a province already severely disadvantaged in terms of social worker numbers) had a turnover of general social workers of 177.8 per cent in 2005 and 155.6 per cent in 2006!

While the limitations of the available vacancy data do not justify attempts to calculate the impact on demand over the next decade, at the most immediate level they indicate that supply is not satisfying current demand and that there is an additional immediate requirement of 1 424 social workers within the public social development sector across the national level and seven provinces alone.

As mentioned at the start of this section, the inability of the majority of social service users to pay for the services they require means that the availability of social worker posts in the labour market is more a function of the availability of funding than a reflection of true demand. An alternative means of unpacking demand at the level of the service user is to compare availability against a set of considered norms and standards.

The DSD (DSD 2005a, 2005c, 2005d) proposed, as part of its welfare service transformation process, that norms and standards be set in terms of the numbers of social workers in the welfare sector against provincial populations. Gauteng is categorised as the only urban province, with a proposed ratio of 1 social worker employed in direct welfare for every 5 000 of the population. KwaZulu-Natal and the Western Cape are regarded as peri-urban provinces with a proposed ratio of 1 : 4 500. The remainder of the provinces are regarded as rural, with proposed ratios of 1 : 3 500 to compensate for problems such as rurally concentrated poverty and the large distances involved in reaching clients. Translated into the numbers of social workers per 100 000 of the population, these norms represent roughly 20 (urban), 22 (peri-urban) and 33 (rural) respectively.

Earle (2007) undertook an analysis of the impact that these provincial norms and standards would have on the demand for social workers, based on projected provincial populations over the period 2005–2015. This analysis indicates that in order to meet the provincial norms, a total of 7 631 *additional* social workers are *currently* needed in direct welfare, a figure which is in excess of the total number of social workers currently employed in this sector (5 076). Considering these norms alongside projected population growth, the requirement for social workers in direct welfare will be a total of 13 313 by 2015.

2 Child Welfare South Africa is an umbrella body that represents 171 affiliates and branches as well as developing children's organisations in communities throughout South Africa. Together with its members, it forms the largest non-profit, non-governmental organisation in the country in the fields of child protection and child and family care and development.

If the current proportion of registered social workers employed in direct welfare remains constant at 45.7 per cent, then the total pool of social workers that will be needed by 2015 in order to satisfy these norms will be 29 131. However, if direct welfare manages to increase its share of employment of the total group of registered social workers to 70 per cent, the projected overall requirement for social workers to meet the norms would reduce somewhat to a figure of 19 019.

Over and above the demand for social workers arising from these general integrated norms and standards, the recent enactment of legislation such as the Older Persons Act (No. 13 of 2006), as well as the proposed enactment of the Prevention of and Treatment for Substance Abuse Bill and the Children's Amendment Bill, will have a direct impact on the demand for these professionals. Estimations of the impact of the Children's Bill on the demand for social workers over the period 2005–2010 are presented by Barberton (2006) according to two scenarios: the 'High' option which describes best-practice norms and standards for all services and activities, and the 'Low' option that describes these only for priority areas. Considering the demand for these professionals within both the DSD and the Department of Justice and Constitutional Development, the need for social workers according to the 'Low' scenario will escalate from 8 683 in 2005/06 to 16 844 in 2010/11, while in the 'High' scenario the figures jump from 48 364 for 2005/06 to 67 507 for 2010/11!

What does the supply-line of social workers look like?

In 2005, 16 tertiary institutions provided social work training in South Africa. An analysis of HEMIS data on total enrolments for the subject of social work between 1999 and 2005 indicates that enrolment for the 4-year professional undergraduate qualification increased from 1 829 in 1999 to 4 085 in 2005 – that is, by 123.3 per cent overall and 14.3 per cent annually (DoE 2007). From a racial perspective, African students increased their proportional representation in enrolment for this qualification over the period from 73.8 per cent to 78.3 per cent. In respect of gender, women make up the majority of enrolments for all qualifications levels, with representation at a low of 84.0 per cent in 1999 and a high of 86.3 per cent in 2001. This supports labour market data for gender as well as for changing demographics of qualifying social workers.

Consideration of only the first-time entering students into social work programmes, which provides a more accurate picture of the flows into the higher education system, confirms an increasing trend. Figures increase from 359 in 2000 to 1 696 in 2005; however, the growth over this period cannot be considered indicative of first-time enrolment growth trends more generally, as it is likely that numbers were particularly low in 2000, due to a combination of factors impacting on both the professional and educational milieux at the time, and that part of the 'increase' is thus 'recovery' to figures evident in the early 1990s.

Combined graduation trends from the professional undergraduate degree as well as the honours degree (which represent most closely the output of students with qualifications suitable for registration with the SACSSP) reveal – in contrast to the escalating enrolment figures – that social work graduation numbers have generally been falling. Annual output levels in the mid-600s at the start of the period dropped to figures below 600 by the end of the period, with the most stark reduction being that from the high of 702 in 1999 to the low of 520 in 2004 (DoE 2007).

The race and gender profile of the total pool of social work graduates (that is, all qualification levels) confirms a consistent female domination alongside racial changes. In 1996, 45.9 per cent of social work graduates were African, a figure which had increased to 63.6 per cent by 2005. To a smaller extent, the proportion of coloured graduates also increased, from 9.1 per cent to 11.1 per cent over the period. Conversely, Indian representation dropped from 5.5 per cent to 3.3 per cent, while the proportion of white graduates reduced from 37.8 per cent to 22.0 per cent.

Using the actual output of 577 in 2005 as the baseline figure, and using various growth estimates, the output of social workers from the higher education system between 2006 and 2015 has been calculated. If output continues to decline at the –3.22 per cent per annum evident between the high of 1999 and the latest figure, the total number of new social workers entering the labour market by 2015 will be 4 841. If output remains consistent at latest levels, a slightly larger figure of 5 770 social workers will become available. Optimistically, if the annual growth of 10.96 per cent evident between the lowest figure (520 in 2004) and the latest figure (577 in 2005) can be maintained to 2015, the higher education system will be able to add a total of 10 685 new social workers to the available professional pool.

How is supply of social workers matching up to demand?

By comparing the various elements of demand for social workers that it is possible to quantify with any accuracy against the levels of output from the higher education system, according to the three scenarios, we are able to reach a clearer understanding of the nature of social worker shortages in South Africa.

At the most basic level – requirements to cover demands arising from death, retirement and emigration at the same time as maintaining current levels of social workers to population – demand will be met by supply over the period 2005–2015, even according to all three output scenarios. The official emigration figures are, however, almost certainly an under-estimation of the true picture and no account has been taken of the suspected but unquantifiable early professional attrition.

Additionally, 1 424 social workers are needed immediately just to fill available vacancies in the public welfare sector at the national level and in 7 of the 9 provinces. The filling of these vacancies would in turn lead to positive changes in the ratio of social workers to population, and subsequent increases in the replacement demand to maintain these new ratios.

Social worker shortages become clearer when one looks at the requirements needed to cover the DSD's proposed integrated norms and standards. Even in the most optimistic case, that annual output from higher education continues to grow at 10.96 per cent and that direct welfare is able to increase its overall share of registered social workers from the current proportion of 45.7 per cent to 70.0 per cent, a shortage of 1 193 social workers will be evident in 2015. At the opposite extreme, should direct formal welfare be unable to increase its share of the total pool of registered social workers and should the number of social work graduates continue to decline by 3.22 per cent annually, as was the trend between 1999 and 2005, the shortage of social workers by 2015 will be 17 149.

Finally, the requirement for social workers arising out of the implementation of the Children's Bill is even greater than anticipated by the 'integrated' norms. Even the realisation of the most optimistic supply scenario, generating a 'surplus' (over and above the requirements needed for replacement demand at consistent ratios) of 1 953 social workers by 2010, there will be insufficient numbers of professionals to meet the demands for social workers arising out of the implementation of this Bill.

Qualifying the shortages of social workers

The figures presented above are merely the final evidence of a complex array of factors that have impacted on the professional practice context and the professional education of social workers in South Africa over the past decade. In telling the story behind the figures, three aspects are key: firstly, the changes in the context of social work practice; secondly, the consequences of these changes; and thirdly, the changes in the context of social work education.

Changes in the context of social work practice

Three distinct but related factors form the foundation of the changing context of social work practice in South Africa after the fall of apartheid in 1994. These include changes in the national socio-economic legislative environment; changes to the welfare needs of the population; and challenges in respect of professional governance and leadership.

National legislation

Internationally, social work as a profession evolved together with the concept of national social and welfare policies, as the group formally tasked with implementation of these policies. Over the century of its development, the profession's relationship with the state has become ever more intertwined and complicated, being not only legitimated and supported by the state and thus reflecting the priorities and values of the host community (Clark 2005), but at the same time having its sphere of practice and autonomy constrained to a large extent by these same factors. Social work is thus by its very nature political (Drucker 2003; Lombard 2005b; Sewpaul 2001).

In South Africa, social work and the welfare system have been closely associated with apartheid politics, as both came into existence in order to address the 'poor white' problem (DSD 2005d). Through promoting primarily the rights and welfare of white South Africans, the profession subsequently came to be seen as an apartheid 'tool', used to maintain and promote social oppression and the marginalisation of certain sectors of the population (Lombard 2005a; Schenck 2004a; Van Eeden et al. 2000).

Democracy in South Africa changed the focus of the welfare sector within less than a decade from being nationally fragmented, exclusive and predominantly focused on the welfare needs of the minority white population, to being nationally united, inclusive and focused predominantly on the needs of the majority, previously disadvantaged, black (African, coloured and Indian) population. Simultaneously, the approach of welfare changed from 'residual' to 'developmental' (DSD 2005a; Lombard 2003), with a substantially increased focus on social security. This was accomplished through a suite of legislative (Triegaardt 2002) and structural (Brown & Neku 2005) changes to the national welfare system, as well as the systems governing the newly defined group of social service professions (Lombard 2000).

However, despite the positive intentions of these changes, not all outcomes were positive. Combinations of issues, such as the lack of clarity and definitions, inconsistencies within and across pieces of legislation, and misunderstandings and mistrust, have resulted in a number of unintended negative consequences. These include a disjuncture between national social and economic policies (Sewpaul 2001); a reduction in the number of public social worker posts during the late 1990s;[3] and a reduction in the funding available for welfare activities.

In respect of the latter, while overall social welfare expenditure escalated to the point where it forms the third-largest programme in South Africa after health and education (Triegaardt 2002), the social development portion was systematically squeezed out as increases in the total budget allocation did not keep pace with the rapid expansion of social security spending. Reduced overall funding has been compounded by provincial autonomy (and subsequent extreme variation) in expenditure on welfare services, both directly and through NGO subsidisation (Earle 2008). Furthermore, while attempting to use NGO subsidisation as a transformation tool to support the move towards the developmental welfare approach, yet without sufficient understanding of what exactly this approach entailed, government funding focused on the group and community work methods to the detriment of equally

3 Interview with the Chief Director: Social Welfare and Transformation of the DSD in 2007

necessary casework – this being the primary method needed by social workers to cover their statutory service obligations (DSD 2005d; Earle 2008; Lombard 2005a; Schenck 2004a).

This legislative environment has, however, not been static. Revised, reconsidered, refined and reactive legislation has been a characteristic of the decade. Important documents impacting on the legislative environment of the social work profession include the *Recruitment and Retention Strategy for Social Workers in South Africa* (DSD 2006); the *Integrated Service Delivery Model for Developmental Social Services* (DSD 2005e); *Norms and Standards for Developmental Social Welfare Services* (DSD 2007); the South African Social Security Agency Act (No. 9 of 2004), which provided for the establishment of the South African Social Security Agency (SASSA) to take over the administration of all social security functions from the provinces as of 1 April 2005; the Accelerated and Shared Growth Initiative for South Africa (Asgisa), and within this, the Joint Initiative on Priority Skills Acquisition (Jipsa) (The Presidency 2006a, 2006b). Coherence of legislation and supporting budgets and human resource capacity for implementation, however, appears to remain a problem.

Professional governance and leadership

One of the primary reasons that social work has been so negatively affected by the changing legislative context has been the lack of coherent professional governance and leadership. This problem presents with a number of distinct facets. Firstly, the SACSSP – the statutory body regulating social work – has suffered from a poor image, particularly among black social workers, who viewed it as a punitive body and as yet another form of apartheid control. Active efforts have been made over the past five years to improve the Council's representivity and to use this structure to promote the interests of the profession by working with various other stakeholders (Earle 2008).

Secondly, social work in South Africa does not yet have a unified professional association to represent the interests of the profession both at national and international levels. Racial and ideological fractures within the profession under apartheid led to the establishment of no less than six professional associations (Mazibuko & Gray 2004). The establishment of such an association is considered to be critical not only to improving the image of the profession, and the benefits of its members, but also to its vision and leadership. The current attempt to do so appears to be making slow but consistent progress (SACSSP 2007).

Finally, due to its political nature as the sector bearing ultimate responsibility for the implementation of national social policy, an element of the leadership of the social work profession will always lie within the national DSD. The initial association of social work with apartheid social policy by leaders within the new DSD resulted in their viewing the profession with considerable distrust and suspicion. Widespread misinterpretation by the DSD of social workers' defence of the casework method (as required to fulfil critical statutory services) as resistance on the part of the profession to embracing the developmental welfare approach, also resulted in a range of negative outcomes. On the other side of the equation, distrust and suspicion by the NGO sector of the government has been the consequence of the widely reported corruption within the DSD.

Thus, despite the fact that government and civil society (the NGO sector, through subsidisation of social worker posts), were traditionally partners in the provision of welfare services (DSD 2004), the post-apartheid era has seen this partnership fraught with a general mistrust and with power struggles over perceived political agendas, as well as a disjuncture between allocated legislative responsibilities and funding (Atkinson 2003; Chabikuli et al. 2005; Earle 2008; Makofane 2003).

National welfare needs

Parallel to the changing social policy context have been the changing national welfare needs that are the focus of social work professional attention. With the shift in focus from the white to the previously disadvantaged population, the size of the recipient population grew exponentially almost overnight, and this by a factor not only related to the differences in population sizes of these groups, but also to the proportions within them requiring social work intervention. Pervasive and increasing social problems include poverty, inequality and unemployment; high levels of crime; high levels of violence against women and children; malnutrition; infant mortality; teenage pregnancy; poor housing and public health; low levels of literacy and education; racism; and large-scale incidence of HIV and AIDS. Furthermore there is evidence that many of these social ills have increased rather than decreased over the past decade (Bak 2004; Makofane 2003; Mathews et al. 2004; Noyoo 2004; Scholtz 2005; Sewpaul et al. 1999; Triegaardt 2002).

Of prime importance here is the impact of HIV and AIDS. Apart from direct effects such as ill health and unemployment, the impact is experienced through increasing social disintegration in the form of 'rising family violence, family disorganisation, mental health problems, crime, substance abuse, commercial sexual exploitation, homelessness and children living and working on the street' (DSD 2004: 11). At the same time, the impact on the profession is more personal: 89.3 per cent of the registered social workers in 2005 were female and between 67.4 per cent and 79.9 per cent (depending on the data source) were between the ages of 20 and 39. The incidence of HIV is highest for women in these age groups, with prevalence in the 20–24, 25–29, 30–34 and 35–39-year age groups being 23.9 per cent, 33.3 per cent, 26.0 per cent and 19.3 per cent respectively (Shisana et al. 2005). Thus the double negative impact of this disease arises not only through the increased demand for social work services, but also because of the reduction in the overall pool of social workers available to meet this demand.

The consequences of the changing context

Primarily, the consequences of the changing context of social work practice can be seen in the areas of salaries, working conditions, professional identity and social worker emigration.

Salaries

Social worker salaries have traditionally been low, not only in South Africa but also internationally; this is attributed by academics to the fact that the profession is largely practised by women, and to the lower status that this affords it (see for example Fortune & Hanks 1988; McPhail 2004; Perry & Cree 2003; Rosenfeld 1987; Sutton 1982). Despite this, the legislative and governance contexts of social work practice in South Africa after 1994 resulted in a rapid erosion of social worker salaries and in the rise of substantial remuneration inequality, firstly, between the public and the private welfare sectors (the former did at least have regular annual increases, while the latter did not), and secondly, across provinces even within these sectors (as the result of provincial budgetary autonomy).

One of the first priorities of the DSD as part of the implementation of its Recruitment and Retention Strategy was the re-grading of social worker salaries within the department, in recognition of the fact that social work is a four-year professional qualification.[4] The re-grading process has, however, not extended to covering the NGO sector. The reason for this has been the retarded financial commitment to the Revised Policy on Financial Awards to Service Providers as a result of 'chronic under-budgeting' (DSD 2004: 15) by government for the subsidisation of NGO-provided social services, and the 'massive (salary) differential between government and the NGO sector which has been allowed to develop over

4 Interview with the Chief Director: Social Welfare and Transformation of the DSD in 2007

the past decade' (DSD 2005a: 21), which has made implementation extremely difficult. Compounding these inequalities has been the provision by the state of other benefits such as medical aid, pensions, housing subsidies and car allowances, which are virtually non-existent for social workers in the NGO sector, as well as the limited scope for upward mobility in respect of salaries that exists within the NGO sector as compared with government.

In respect of the second issue, provincial inequalities have been allowed to develop due to the autonomy of provincial welfare departments in not only determining social worker salaries within the public welfare sector, but furthermore having the right to determine the overall proportion of the budget that will be used to subsidise the NGO sector and the proportional level of such subsidy. As a result, social workers across the provinces within the same national NGO receive different salaries.

The salary differential that now exists between the government and NGO welfare sectors, and between different provinces within the NGO sector, together with government's recent focus on filling vacancies and increasing the overall number of social worker posts, has resulted in a massive flow of social workers out of the NGO sector and into the public welfare sector. Yet even despite recent improvements in government salaries, social worker salaries remain low in relation to the high workloads, emotional stress and occupational risks involved (Earle 2008).

Working conditions

The working conditions for most social workers in the welfare sector in South Africa – regardless of whether they are based within the public or the private arenas – are generally very poor. Social workers are frustrated with the overwhelming needs of the community in relation to their own relatively low numbers and their limited (or lack of) access to resources such as adequate supervision, stationery, office space and furniture, information technology, administrative and language support, vehicles and supporting professionals, and institutions such as places of safety. Furthermore, with statutory work taking precedence by law over the group work and community work that attracts funding, the latter is generally crowded out and social workers find themselves continually torn between the two. Due to the small numbers of social workers in certain government and NGO offices, the opportunity for specialisation (which is said to increase productivity and reduce work-related stress) is very limited, with social workers forced to do all forms of social work, some of which are sometimes considered to be in conflict. The combination of these factors results in extremely high caseloads, inefficiency, workplace stress and anxiety, empathy exhaustion, emotional burnout, and even incidents of malpractice as social work is reduced to crisis management. Related to this, the staff turnover of social workers in NGOs is particularly high (in large part due to the pull of higher government salaries), with this exacerbating the conditions for those left behind, as workloads increase proportionally and time is lost in retraining new junior staff (Brown & Neku 2005; Earle 2008; Schenck 2004b).

Professional identity

A number of factors have together served to undermine the image and identity of the social work profession. The *White Paper on Social Development* (DSD 1997) states that the country needs social development rather than social work to deal with the paramount problem of poverty, and that social development will not be carried out only by social workers but by a group of social service professions, among which social work will only be one. The exact role of social work in relation to these other 'professions' is, however, left ambiguous (Bak 2004). The amendment of the Social Work Act (No. 110 of 1978) to become the Social Service Professions Act[5] took this intention further by making legislative

5 This Act was repealed late in 2007, due to inconsistencies arising out of its string of amendments since 1987. The new Social Service Professions Bill, 2007, has been tabled. This has not yet been enacted (see SACSSP 2008).

provision for the establishment of social service professions other than social work, and for the SACSSP as their governing body (Lombard 2000). Combined with often open government antagonism, funding pressures, and the freezing of public social worker posts in the latter part of the 1990s, these factors resulted in much confusion about the future of social work as the relevant, leading and most highly trained profession within the social service occupational group (Gray 2000; Lombard 2000; McKendrick 2001) and in a subsequent crisis of professional identity and confidence (Bak 2004; Brown & Neku 2005; Gray 2000; Lombard 2003, 2005b; Schenck 2004a).

Compromise has come, on the one hand, through recognition by the Recruitment and Retention Strategy for Social Workers in South Africa of the need to address the poor image of the profession (DSD 2005c: 46) and the admission that social workers are key among the range of professionals providing welfare services (DSD 2005a: 22), and on the other hand, through admission by the profession that the support and co-operation of all occupations involved in social welfare will be needed if the demands of developmental social welfare are to be met in the face of increasing national needs and limited resources (Lombard 2000; McKendrick 2001). However, in support of such co-operation, there are calls that the roles, functions and responsibilities of each group in relation to the other should be more clearly defined (Gray 2000; Schenck 2004a).

Emigration

While the quantitative impact of emigration on social worker supply was discussed above, it is necessary here to link this movement to the combination of all the factors placing pressure on the practice of the social work profession in South Africa, in addition to social issues such as the high crime rate and concerns over public heath and education that serve as 'push' factors. Pull factors are generally considered to be the opposite of the push factors, with individuals attracted by the higher salaries, better working conditions, more satisfying jobs, greater career prospects, greater personal safety, better educational opportunities for children, and the greater personal benefits received for taxes that are available in countries such as the UK, Australia, New Zealand, Canada and the USA (Bach 2003; Martineau et al. 2002; Mathlabe 2001; Sanders & Lloyd 2005; Sewpaul 2002).[6] Despite indications that the flow of social workers to the UK particularly may have slowed due to the combined impact of changes in the registration requirements and inter-governmental agreements to prohibit direct large-scale recruitment, as long as working conditions and salaries remain poor, and the wider social environment raises questions about the longer-term quality of life for professionals and their children, migration – both out of the country as well as to other sectors within the domestic labour market – is likely to remain a key drain on South African social work skills.

Changes in the context of social work education

Central to the changes affecting the education and output of social workers in South Africa have been the challenges and changes related to DoE funding of social work education. Firstly, the change from a three- to a four-year professional undergraduate qualification (implemented from 1987) has never been formally recognised in funding formulas, with the fourth year receiving only additional general undergraduate levels of funding rather than funding at the honours equivalent level (Earle 2008). Secondly, and compounding the above, has been the fact that in line with the DoE's attempt to shift the focus of higher education output away from the humanities and towards the sciences, social work is funded according to the lowest funding category. Funding at this level ignores the requirement for three-pronged professional education (that is, theory, practice and research), as well as the fact that social work has been declared a scarce skill. The direct impact of this has been most evident in

6 See Sidley P, South Africa and Britain reach agreement to curb poaching of healthcare staff, *British Medical Journals News* 4 September 2004, accessed 10 January 2006, http://bmj.bmjjournals.com/cgi/content/full/329/7465/532

the reduction of permanent highly qualified educators and an increasing reliance on lesser-qualified part-time staff at the departments of social work, as well as in the progressive erosion of programme depth and breadth. In addition, many residential universities have capped the numbers of social work students they are willing to admit (Earle 2008). Thirdly, the National Plan for Higher Education (DoE 2001) proposes, as a means of improving tertiary institutions' graduation rates, that funding be linked to output of graduates rather than to enrolment figures.

The full impact of these latter two funding policies on social work education must be seen in the light of a range of other factors alluded to already. The challenges and uncertainties within the professional practice of social work over the past decade – and in particular, factors such as its poor remuneration, work conditions and general professional image – have substantially reduced the appeal of the profession to white students, who were generally made aware of these issues. Black students, on the other hand, still had experience of social workers in their communities as individuals with professional status. This, in addition to social work being one of the few professions that does not require mathematics and science at matriculation level for entry, drove in large part the rapid demographic changes noted in the figures presented earlier in this chapter. Overlying the above general demographic shift has been a trend for black school-leavers with high-quality passes to not only seek enrolment at historically white universities, but additionally to choose courses that promise more lucrative careers than does social work. Thus the general applicant for social work studies has not only shifted over the period in respect of race from white to black, but has generally shifted downwards in respect of foundational education, with historically black universities being most directly affected (Earle 2008).

Returning to the impact of national higher education funding policies on social work education, it becomes clear that at a time when the average student being admitted to study social work is requiring increased individual attention and support in order to successfully overcome a myriad past educational and social disadvantages and graduate as a qualified professional, shifts in funding focus have not only resulted in higher student-to-staff ratios and thus less individual attention, but also in the use of less-qualified educators. The effects of this unfortunate coincidence are clearly evident in the comparison of increasing enrolment versus decreasing graduations (Earle 2008).

Adding to this situation the proviso that funding will only be paid to higher education institutions upon students' graduations has led to two distinct unintended negative consequences. Talk of increasing the general admission requirements at certain historically white institutions will impact directly on the admission requirements for social work students, with the potential exclusion of those who are at risk of failure but are currently still eligible for admission. Conversely, particularly at historically black institutions for which this is not an option, there is substantial and increasing pressure on social work educators to adjust standards downwards in order to achieve adequate pass rates (Earle 2008).

The implementation of the uniform Bachelor of Social Work degree from 2007, with its 27 specific outcomes, is considered to be extremely positive in that it will set a minimum quality for social work student output. Furthermore, it has provided individual social work departments with evidence to back up their requests for increased funding at the institutional level (Earle 2008). However, as the first group passing through this programme will only graduate in 2010, the impact on student throughput is as yet an open-ended question.

Also related to funding – but at the personal level – the changing demographics of social work students have resulted in personal access to finance becoming a much more critical issue in relation to social work education, in terms of access, throughput, as well as graduation (Earle 2008).

Linking the qualitative to the quantitative

Emerging from a consideration of both the quantitative and the qualitative aspects of this report are two critical points.

Firstly, in South Africa, there is currently an absolute scarcity of social work skills. This is underscored by data on the current number of vacancies within the DSD, the high levels of staff turnover within the NGO sector, and the replacement demand for social workers over the next decade as compared with output from the higher education system. The reasons for this absolute scarcity are multi-faceted, but can be summarised as follows:

- The re-focus of welfare services towards the previously disadvantaged groups brought about by democracy resulted in a substantial increase in demand in respect of the focus population per social worker.
- The welfare needs of this previously disadvantaged population have escalated due to the disproportionate impact of HIV and AIDS, thus increasing demand for traditional welfare services within this new client segment.
- Government is in the process of legislating welfare service delivery in order to comply with its constitutional obligations to vulnerable groups such as children, the elderly, the disabled and those suffering from substance abuse. The result is that there is an increasing demand for social workers to cover these new services.

Secondly, the absolute scarcity of social workers intersects with relative scarcity. Relative scarcity is also multi-dimensional:

- Scarcity is higher in the private (NGO) than in the government welfare sector, due particularly to the impact of government's salary re-grading process and the differential that this has caused, directly in respect of remuneration and indirectly in respect of working conditions.
- Scarcity is higher in certain geographical areas than in others. This is the result of three intersecting factors: the differential in provincial budgetary allocations to social welfare in general and NGO subsidies more specifically, which has resulted in remuneration in certain provinces being higher than in others; the generally more attractive nature of certain provinces (Gauteng and the Western Cape) which pulls skilled workers from across the board, due to the availability of other social and economic opportunities and facilities that are clustered there; and the fact that NGOs with rural offices struggle to find social workers who are willing to live and work in these pockets of poverty for the salaries that these agencies are able to provide.
- There is a scarcity of black social workers in the NGO sector as a result of the compounding influences of overall scarcity, higher government salaries, and preferential employment of black professionals within government.
- There is a scarcity of black social workers in the higher age groups, resulting in scarcity of these professionals for recruitment into experienced, high-level management positions within the profession. This is exacerbated by the fact that these people have numerous more lucrative opportunities for management in the public welfare and non-welfare sectors.

The way forward

Stemming directly from the declaration of social work as a scarce skill, and the subsequent research and policy documents that have emerged from this (Barberton 2006; DSD 2005e, 2006; Earle 2008), have been a number of recommendations regarding the recruitment and retention of social workers in South Africa. These recommendations address the following themes: general recommendations regarding welfare contextual and governance policies; remuneration; recruitment and retention; education and training; and working conditions.

Furthermore, there is evidence that these key stakeholders have accepted the critical nature of these recommendations. This is extremely positive, as failure to address the current shortages of social workers is likely to result in a collapse of the entire national welfare system, with consequent increased poverty and inequality; escalating social disintegration and related crime, violence and abuse; and unsustainable increases in the levels of demand for social security.

Stakeholders such as the SACSSP, the DSD, NACOSS and educational bodies such as the Standards Generating Body are all involved in the implementation of these recommendations at various levels. Despite some inconsistencies, it appears as if certain strides are being made towards implementation, with implementation thus currently a 'work in progress'. These bodies, individually and collaboratively, are ideally placed to address the vast majority of the recommendations. Three recommendations, however, stand out from the rest in respect of the impact that DoL intervention can potentially have on successful implementation:

- The DoL can enter the negotiations with the DoE on behalf of the social work profession about improving the funding allocation of social work education at a national level. An improvement in funding from the current D4 category (on the funding matrix of 1–4, and A–D, D4 represents the lowest level) will allow for increased numbers of permanent and highly qualified staff to support increasing numbers of students from disadvantaged backgrounds to convert access into success within minimal time.
- The DoL can work with the Health and Welfare Sector Education and Training Authority (HWESTA), the DSD, the SACSSP and the Association of South African Social Work Education Institutions (ASASWEI) on ways to obtain funding for fourth-year social work students, in line with current internship funding. Such funding would not only provide financial support to all social work students, and thus complement the targeted bursary scheme (a key recommendation for the support of education and recruitment), but is likely to lead to an increased overall efficiency of graduations, as those students who are forced to take time out to work and generate renewed funding will be encouraged to move more directly through the system. Additionally, access to funding at this level would allow students, especially those from rural higher education institutions, to access placements in more expensive urban areas, which would in turn provide them with a more rounded education through exposure to diverse social circumstances and welfare agencies.
- The DoL can work with the HWSETA and potential providers of the National Qualifications Framework (NQF) Level 4 Learnership in Social Auxiliary Work on ways to reduce the burden of training provision placed on agencies that are already under-staffed and under-funded. In particular, the provision of the fundamental unit standards of literacy and numeracy appears to be a problem for these employers, and alternative provision mechanisms for these need to be sought.

References

Atkinson D (2003) The coalface of delivery: Municipalities and the future of community development workers. Paper presented at the ASASWEI Conference, UNISA, Pretoria. Accessed 21 May 2007, www.asaswei.org.za

Bach S (2003) *International migration of health workers: Labour and social issues*. Working Paper No. 209, International Labour Office, Geneva. Accessed 18 January 2006, http://www.ilo.org/public/English/dialogue/sector/papers/health/wp209.pdf

Bak M (2004) Can developmental social welfare change an unfair world? The South African experience. *International Social Work* 47(1): 81–94

Barberton C (2006) Executive summary: The cost of the Children's Bill – Estimates of the cost to Government of the services envisaged by the Comprehensive Children's Bill for the period 2005 to 2010. Report for the national Department of Social Development.

Brown M & Neku RJ (2005) A historical review of the South African welfare system and social work practitioners' views on its current status. *International Social Work* 48(3): 301–312

Chabikuli N, Gilson L, Blaauw D & Schneider H (2005) Human resource policies. In P Ijumba & P Barron (eds) *South Africa health review 2005*. Durban: Health Systems Trust

Clark C (2005) Moral character in social work. *British Journal of Social Work* 36(1): 75–89

DoE (Department of Education, South Africa) (2001) *National plan for higher education in South Africa*. Pretoria: DoE

DoE (2007) *Higher Education Management Information System (HEMIS) Database 1999–2005*. Pretoria: DoE

DoL (Department of Labour, South Africa) (2005) *National Skills Development Strategy 1 April 2005–31 March 2010*. Pretoria: DoL

DPSA (Department of Public Service and Administration, South Africa) (2005) *PERSAL database: extraction of social worker posts*. Pretoria: DPSA

Drucker D (2003) Whither international social work? *International Social Work* 46(1): 53–81

DSD (Department of Social Development, South Africa) (1997) *White paper on social developmen*t. Pretoria: DSD

DSD (2004) *Policy on financial awards to service providers, 2004*. Pretoria: DSD

DSD (2005a) Welfare service transformation presentation. 28 July. Pretoria: DSD

DSD (2005b) Social worker posts and vacancies for Gauteng, KZN, Limpopo, Mpumalanga, Northern Cape, Western Cape and National departments of social development. Personal correspondence, October 2005. Pretoria: DSD

DSD (2005c) Recruitment and retention strategy for social workers in South Africa. Fifth draft, 30 August 2005. Pretoria: DSD

DSD (2005d) *Service delivery model for developmental social services*. Final draft, 28 February 2005. Pretoria: DSD

DSD (2005e) *Integrated service delivery model for developmental social services*. Pretoria: DSD

DSD (2006) *Recruitment and retention strategy for social workers in South Africa*. Final draft, October 2006. Pretoria: DSD

DSD (2007) *Norms and standards for developmental social welfare services*. Thuthukisa Project. Pretoria: DSD

Earle N (2007) The demand and supply of social workers in South Africa. In A Kraak & K Press (eds) *Human resources development review 2008. Education, employment and skills in South Africa*. Cape Town: HSRC Press

Earle N (2008) *Social work in social change: The profession and education of social workers in South Africa*. Cape Town: HSRC Press

Engelbrecht L (2006) Plumbing the brain drain of South African social workers migrating to the UK: Challenges for social service providers. *Social Work/Maatskaplike Werk* 42(2): 206–216

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

Fortune A & Hanks L (1988) Gender inequities in early social worker careers. *Social Work* 33(3) 221–226

Gray M (2000) Social work and the new social service professions in South Africa. *Social Work/Maatskaplike Werk* 36(1): 99–109

GSCC (General Social Care Council, UK) (2005) Extract from dataset: Verification data by country breakdown, 1990–2004. Accessed October 2005, via personal correspondence

GSCC (2007) Extract from dataset: Qualification equivalence data by country breakdown, 2005–2007. Accessed June 2007 via personal correspondence

Lombard A (2000) The professional status of social work. *Social Work/Maatskaplike Werk* 36(4): 311–331

Lombard A (2003) Social work and economic development: A challenging reality. Paper presented at the ASASWEI Conference, UNISA, Pretoria. Accessed 21 May 2007, www.asaswei.org.za

Lombard A (2005a) Social work in South Africa: Ten years into democracy. Unpublished draft manuscript

Lombard A (2005b) Impact of social services on human, social and economic development and the promotion of human rights in South Africa. *Social Work/Maatskaplike Werk 2005* 41(3): 209–227

Makofane D (2003) Factors affecting social development in rural communities. Paper presented at the JUC Conference, UNISA, Pretoria

Martineau T, Decker K & Bundred P (2002) *Briefing note on international migration of health professionals: Leveling the playing field for developing country health systems*. Accessed 15 January 2006, www.iv.ac.UK/lstm/hsrhome.html

Mathlabe D (2001) The transition to work: Professional social workers in their first year of practice. *Social Work / Maatskaplike Werk* 37(1): 59–71

Mathews S, Abrahams N, Martin L, Vetten L, Van der Merwe L & Jewkes R (2004). *Every six hours: A national study of female homicide in South Africa*. Medical Research Council Policy Brief No. 05. Accessed 28 May 2007, http://www.mrc.ac.za/policybriefs/woman.pdf

Mazibuko F & Gray M (2004) Social work professional associations in South Africa. *International Social Work* 47(1): 129–142

Mbeki T (2007) *State of the nation address of the President of South Africa, Thabo Mbeki*. Joint Sitting of Parliament, 9 February 2007. Accessed 10 May 2007, http://www.info.gov.za/speeches/2007/07020911001001.htm

McKendrick BW (2001) The promise of social work: Directions for the future. *Social Work/Maatskaplike Werk* 37(2): 105–111

McPhail B (2004) Setting the record straight: Social work is not a female dominated profession. *Social Work* 49(2): 323–326

NACOSS (National Coalition of Social Services) (2007) Data on number of posts and resignations within NACOSS-affiliated NGOs. June/July 2007, personal correspondence

Noyoo N (2004) Human rights and social work in a transforming society: South Africa. *International Social Work* 47(3): 359–369

Perry R & Cree V (2003) The changing gender profile of applications to qualifying social work training in the UK. *Social Work Education* 22(4): 375–383

Quantec (2007) *RSA regional indicators*. Accessed September 2007, www.quantec.co.za

Rosenfeld P (1987) Research Issues: Nursing and professionalization. Keynote address at the Annual Nursing Research Day, May 1987, Jersey City, NJ

SACSSP (South African Council of Social Service Professions) (2005) *Data on the numbers, demographics and distribution of registered social workers in South Africa, 1996–2005*. Pretoria: SACSSP

SACSSP (2007) *Official newsletter* 26(1). Pretoria: SACSSP

SACSSP (2008) *Review of the Social Service Professions Act, 110 of 1978*. Accessed 20 March 2008, http://www.sacssp.co.za/

Sanders D & Lloyd B (2005) Human resources: International migration. In P Ijumba & P Barron (eds) *South Africa Health Review 2005*. Durban: Health Systems Trust

SAQA (South African Qualifications Authority) (2004) *Trends in public higher education in South Africa 1992 to 2001: Analysis of the National Learners' Records Database, Report 1*. Pretoria: SAQA

Schenck CJ (2004a) A discussion document on social work.Unpublished mimeo for HSRC

Schenck CJ (2004b) Working conditions for social workers in rural areas in South Africa. *The Social Worker Practitioner Researcher* 16(2): 181–199

Scholtz L (2005) The political and socio-economic framework of the New South Africa. Paper presented at the ASASWEI conference, University of Stellenbosch. Accessed 21 May 2007, www.asaswei.org.za

Sewpaul V (2001) Economic globalisation and social policy reform: Social work curricula in the South African context. *Social Work/Maatskaplike Werk* 37(4): 309–323

Sewpaul V (2002) Discussion document on global qualifying standards for social work education and training. The Global Minimum Qualifying Standards Committee

Sewpaul V, Lombard A, Louw L & Noyoo N (1999) Social policy training and social work: The South African context. *Journal of Social Development in Africa* 14(1): 5–18

Shisana O, Rehle T, Simbayi L, Parker W, Zuma K, Bhana A, Connolly C, Jooste S & Pillay V (2005) *South African national HIV prevalence, HIV incidence, behaviour and communication survey, 2005*. Cape Town: HSRC Press

Stats SA (Statistics South Africa) (1989) *Tourism and migration 1989. Statistical release P0351*. Pretoria: Stats SA

Stats SA (1991) *Tourism and migration 1991. Statistical release P0351*. Pretoria: Stats SA

Stats SA (1993) *Tourism and migration 1993. Statistical release P0351*. Pretoria: Stats SA

Stats SA (1996) *Tourism and migration 1996. Statistical release P0351*. Pretoria: Stats SA

Stats SA (1999) *Documented migration 1997 and 1998.* Report No. 03-51-03. Pretoria: Stats SA

Stats SA (2000a) *Documented migration 1999.* Report No. 03-51-03. Pretoria: Stats SA

Stats SA (2000b) *Tourism and migration 2000. Statistical Release P0351*. Pretoria: Stats SA

Stats SA (2003) *Census 2001 community profiles dataset*. Pretoria: Stats SA

Sutton J (1982) Sex discrimination among social workers. *Social Work* 27: 211–217

The Presidency (Republic of South Africa)(2006a) *Accelerated and Shared Growth Initiative for South Africa (Asgisa) 2006 Annual Report*. Pretoria: The Presidency

The Presidency (2006b) *Joint Initiative on Priority Skills Acquisition (Jipsa) 2006 annual report*. Pretoria: The Presidency

Triegaardt J (2002) Social policy domains: Social welfare and social security in South Africa. *International Social Work* 45(3): 325–336

Van Aardt CJ (2004) *A projection of the South African population, 2001 to 2021*. Pretoria: University of South Africa, Bureau of Market Research

Van Eeden ES, Ryke EH & De Necker ICM (2000) The welfare function of the South African government before and after apartheid. *Social Work/Maatskaplike Werk* 36(1): 1–24

Work Permits (UK) Freedom of Information Division (2007) *Dataset: UK work permits issued to South African social workers, 2000–2005*. Accessed July 2007, www.FreedomofInformation.workpermits@ind.homeoffice.gsi.gov.UK

CHAPTER 5

Engineering professionals

Rènette du Toit and Joan Roodt

This study on engineering professionals has been produced at a crucial juncture in the history of engineering in South Africa. The country is embarking on a massive and very expensive expansion in infrastructure, partly in preparation for its hosting of the FIFA World Cup, while at the same time facing a shortage of engineering capacity, particularly in the public sector, that has been described as one of the worst capacity and scarce skills crises in years. As an indication of the dilemma, it can be noted that South Africa has approximately 473 engineers[1] per million citizens, while Japan has an estimated 3 306 (Lawless 2005). In 2002, Japan shared the hosting of the football World Cup with South Korea, while South Africa is to be the sole host in 2010!

There are many factors contributing to our situation, including the status and image of the engineering professions in relation to other more lucrative careers, the shortage of matriculants who meet the criteria to gain entrance to engineering degree programmes, and the high quality of engineering education in this country which ironically makes our graduates in great demand internationally. This chapter presents a profile of the engineering labour market, and considers the nature and extent of the education of engineering professionals.

It should be noted that there are three main types of engineering professional in South Africa: engineers, engineering technologists and engineering technicians. A fourth designation of 'certificated engineer' refers to particular certificates that need to be held for specific roles in mining and industry, and is not discussed here in any detail. The designation depends first of all on the tertiary qualification that has been attained. Engineers hold a four-year bachelor of science (BSc (Eng)) or bachelor of engineering (BEng/Ing) degree from a university, technologists hold a bachelor of technology (BTech) degree from a university of technology, and technicians hold a national diploma (NDip) from a university of technology. Throughout this chapter the term 'engineering professional' will be taken to refer to this collective group, while the term 'engineer' refers only to those holding the four-year university degree.

Employment of engineering professionals in South Africa

Quantec 2007 employment data, which are based on Statistics South Africa's October Household Surveys (OHS) and Labour Force Surveys (LFS), were used in this study (Quantec 2007). The employment data on engineering professionals show huge fluctuations between 1996 and 2005, which makes

1 This figure includes engineers who are not registered.

it very difficult to estimate employment and show employment trends accurately. We decided to calculate an average of people working in a year over a 10-year period (1996–2005) to get an estimate of employment; and to calculate the averages for 2-year periods from 1996 to 2005 to get a better employment trend.

Table 5.1 shows that on average, 124 567 people were employed in engineering professional positions in South Africa over the 1996–2005 period. Almost a third (39 686) were employed as engineers and technologists and more than two-thirds (84 881) as technicians. Among those that were employed as engineers and technologists, on average, 61 per cent (24 202) had degrees, 17 per cent (6 667) national diplomas and 22 per cent (8 817) only had a National Qualifications Framework (NQF) Level 4 or lower qualification. Among those employed as technicians, 4 per cent (3 047) had degrees, 28 per cent (23 694) had national diplomas and more than two-thirds (58 140) had qualifications at NQF Level 4 or less.

The large average number of 58 140 people who worked without the required qualification as engineering technicians is noteworthy. This trend relates to the difficulty that national diploma students experience in finding industrial placements for their experiential training year (Interview 2006a; Lawless 2005). This means that they don't get the opportunity to work for an employer for the required period of time in order to complete their experiential training and obtain the necessary qualifications (Interview 2006a; Interview 2006b). Over the 1996–1999 period, 57 per cent of these under-qualified engineering professionals were white, and 48 per cent of them were in the age category 65–69 years of age, while over the 2000–2005 period, 45 per cent were white and younger than those in the earlier period, with a quarter in the age category 30–34 years of age (Quantec 2007). This could be because over the 1996–1999 period, people were appointed because of work experience already gained, although they did not have appropriate qualifications, as they were predominantly older people; while over the more recent period, the people appointed were younger and therefore probably still trying to get experiential training in order to qualify.

Lawless (2005) found in her civil engineering study that about 60 per cent of final-year national diploma students who responded to her survey in October and November 2004 had not had experiential training and therefore could not graduate. According to the LFS data, it seems as if they are indeed working in the engineering labour market. At this level the skills are available, but strategies need to be put in place to assist the workers to complete the experiential training that will allow them to obtain their national diplomas and register as professional engineering technicians. In this case, it is necessary to distinguish between a *scarce skill* and a *skill gap* – these people are almost qualified and working as technicians, but they just need the opportunities to do their experiential training in order to close the *skill gap*.

The LFS data further reveal that about 10 000 people with a degree and over 48 000 people with a national diploma in an 'engineering-related field' work in occupational categories ranging from sales workers to machine operators, with the exception of managers. Furthermore, about 1 600 people with a degree in an 'engineering-related field' were unemployed in the period covered by the data, compared to over 10 000 with a diploma in an engineering-related field. Three-quarters (75 per cent) of this unemployed group were black (that is, African, coloured or Indian), and well over half (59 per cent) were men.

It is important to note that among those who were employed as engineers and technologists, a significant number (an average of 6 667 per annum) only had a national diploma-level qualification. This could be as a result of poor data, coding problems, incorrect responses or because an insufficient number of qualified engineers and/or technologists are available to be appointed, especially at municipal level.

TABLE 5.1: *Total employment of engineering professionals, by occupation and qualification level, 1996–2005*

Engineers & technologists													
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total	Average employed p.a.	Average annual growth %
Degrees	19 890	15 729	24 153	19 024	22 212	28 272	33 868	23 343	22 181	33 346	242 018	24 202	5.91
National Diplomas	167	10 146	16 977	6 580	7 343	2 813	2 862	2 224	5 818	11 743	66 672	6 667	60.41
NQF4 or less	9 471	12 186	9523	13714	10730	2671	4309	4338	5121	16104	88167	8 817	6.08
Total	29 528	38 061	50.653	39.318	40.285	33.756	41.039	29.905	33.120	61.193	396.858	39 686	8.43
Technicians													
Degrees	2 257	3 089	1 902	3 016	1 107	1 723	2 717	5 810	2 052	6 798	30 471	3 047	13.03
National Diplomas	26 405	8 875	13 330	16 236	29 362	22 848	30 470	24 750	27 222	37 438	236 935	23 694	3.96
NQF4 or less	71 684	10 292	6 958	68 212	52 174	63 623	61 903	68 362	100 549	77 646	581 404	58 140	0.89
Total	100 346	22 256	22 190	87 464	82 644	88 194	95 090	98 922	129 822	121 881	848 810	84 881	2.18
Engineering professionals													
Total	129 874	60 317	72 843	126 782	122 929	121 950	136 129	128 827	162 942	183 074	1 245 668	124 567	3.89

Source: Quantec 2007

According to Gareth van Onselen, the Democratic Alliance's head of research in Parliament, South Africa's six major metropoles have 732 civil engineering professionals between them – not all qualified engineers – serving a population of about 15.6 million.[2]

For the purposes of the rest of this study, we have decided to include all national diploma-qualified people with the technicians and not with the engineers and technologists. Technicians with degrees were kept as technicians. Further analysis in this monograph will be based on the 24 202 annual average of engineers and technologist with degrees and the 33 408 annual average of technicians with national diplomas (23 694 plus 6 667) and degrees (3 047) employed over the 1996–2005 period.

Looking at the average number of engineers and technologists with degrees working in a specific year over the 1996–2005 period (Table 5.2), we see that people with civil engineering degrees represent almost a third (29 per cent), mechanical engineers a fifth (20 per cent), and electrical engineers 16 per cent of the total. The category 'engineers not elsewhere classified' (n.e.c.) represents about 15 per cent of total employment of engineers and technologists with degrees, and includes engineering fields such as agricultural, industrial and robotics engineering, according to the South African Standard Classification of Occupations (SASCO). Electronics and telecommunications engineers and technologists account for 6 per cent, while cartographers and surveyors, mining engineers, chemical engineers, metallurgists and related professionals represent about 5 per cent.

Considering the annual average number of technicians with national diplomas/degrees over the same period, the picture looks different. Almost a third (31 per cent) held diplomas in electronics and telecommunications engineering, with electrical engineering technicians accounting for less than a fifth (18 per cent), mechanical engineering technicians for 17 per cent and civil engineering technicians for only 14 per cent. This trend impacts on the ratios of engineers and technologists to technicians in the different fields. This is especially the case in civil engineering, where there is a shortage of enough technicians in proportion to civil engineers, with resultant impacts on service delivery at municipal level.

Among the degree-qualified engineers and technologists, the number of electrical engineers and technologists achieved an encouraging average annual growth rate of 36 per cent, cartographers and surveyors 17 per cent, those not elsewhere classified 13 per cent, and mechanical engineers and technologists 4 per cent over the 1996–2005 period. Negative growth rates over this period were reported for the categories mining, metallurgy and related professionals (–14 per cent), chemical (–1 per cent), electronics and telecommunications (–0.4 per cent) and civil engineers and technologists (–0.2 per cent).

Contrary to the negative growth in employment for electronics and telecommunications engineers and technologists, there was an average annual increase of 13 per cent in employment for technicians in this field. The reverse is noticed for the electrical field: there was a slow growth in employment for electrical technicians compared to the very positive growth for electrical engineers and technologists.

For engineers and technologists, the electrical engineering field showed the biggest absolute employment gain over the 1996–2005 period, while for technicians the most growth was in the field of mechanical engineering.

Figure 5.1 provides a picture of the employment trends for engineers, technologists and technicians over 2-year periods for 1996–2005 (based on figures in Table 5.2). The figure shows that the average annual growth rate of employment for engineers and technologists for the full period 1996–2005

2 Engineering a response to SA's infrastructure woes, *Business Day* 5 March 2007

TABLE 5.2: *Total employment of engineering professionals with degrees and national diplomas, by discipline, 1996–2005*

Engineers & technologists with degrees	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total	Average employed p.a.	Average annual growth %
Civil	12 065	4 115	7 104	5 264	3 333	9 663	6 616	5 760	5 133	11 870	70 923	7 092	–0.18
Electrical	523	3 942	3 038	1 495	2 218	5 545	3 939	3 618	5 790	8 540	38 649	3 865	36.39
Electronics & telecom	1 804	2 211	0	794	5 416	470	2 911	1 756	0	0	15 361	1 536	–0.38[a]
Mechanical	1 992	556	7 389	5 026	4 522	7 446	10 327	3 608	5 172	2 959	48 997	4 900	4.49
Chemical	520	616	1 412	1 048	383	969	1 736	2 269	1 074	475	10 502	1 050	–1.00
Mining & metallurgy	0	679	0	890	2 871	801	1 914	1 980	1 058	210	10 403	1 040	–13.64[b]
Cartographers & surveyors	527	1 309	1 983	249	1 597	0	909	659	2 375	2 139	11 748	1 175	16.84
Not elsewhere classified (n.e.c.)	2 459	2 301	3 226	4 258	1 872	3 378	5 516	3 693	1 579	7 153	35 436	3 544	12.60
Total with degrees	19 890	15 729	24 153	19 024	22 212	28 272	33 868	23 343	22 181	33 346	242 018	24 202	5.91

TABLE 5.2 *contd*

Technicians with National Diplomas or degrees	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total	Average employed p.a.	Average annual growth %
Civil	6 279	6 300	5 994	1 182	7 682	4 321	3 816	1 758	1 628	6 543	45 504	4 550	0.46
Electrical	7 529	3 420	7 749	4 124	4 052	3 565	8 868	4 155	6 319	8 772	58 552	5 855	1.71
Electronics & telecom	7 796	2 389	5 741	6 530	8 079	8 376	9 502	16 290	14 714	23 848	103 266	10 327	13.23
Mechanical	2 124	3 286	6 212	6 688	10 411	4 106	7 131	2 023	2 420	11 507	55 909	5 591	20.65
Chemical	0	0	583	1 794	0	676	1 943	0	395	0	5 391	539	−6.27[c]
Acidiser	2 339	924	539	0	1 232	1 291	1 339	1 030	2 958	2 470	14 121	1 412	0.61
Draughtsperson	1 449	1 968	2 798	2 180	3 795	4 279	2 950	6 825	5 289	2 562	34 093	3 409	6.54
Not elsewhere classified (n.e.c.)	1 313	3 823	2 591	3 333	2 562	772	500	705	1 367	277	17 243	1 724	−15.87
Total with National Diploma/degree	28 829	22 110	32 208	25 831	37 813	27 384	36 049	32 784	35 091	55 978	334 078	33 408	7.65

Source: Quantec 2007

Notes: a. 1996–2003; b. 1997–2005; c. 1998–2004

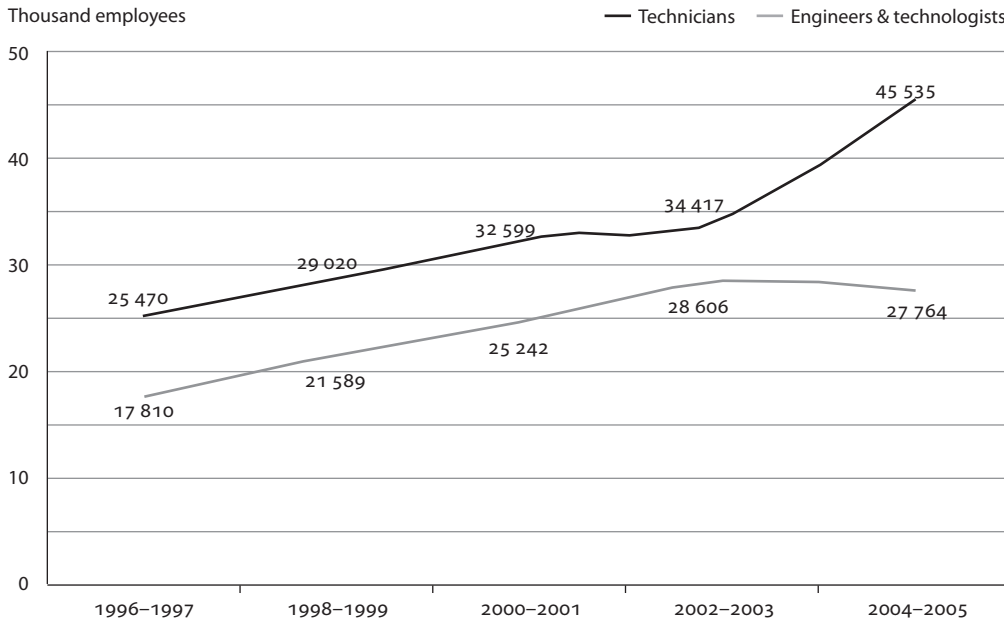
was 5.9 per cent. Technicians followed the same trend as the engineers and technologists over the 1996/97–2002/03 period; however, over the 2004/05 period, there was a drastic increase in the number of technicians as opposed to the decrease in the number of engineers. The average annual growth in the number of technicians over the whole 1996–2005 period was 7.7 per cent (from 28 829 in 1996 to 55 978 in 2005).

Table 5.5 (in the section below on the supply of engineering professionals) will show that there was also a bigger increase in the graduations of technicians at tertiary institutions (2.5 per cent average annual growth) than in the graduations of engineers (1.0 per cent average annual growth) over the 1996–2005 period, although graduations of technologists (3.7 per cent) increased the most over this period.

Employment distribution

In a broad sense, engineers are at the core of two key areas of development enterprise in the country: building and maintaining infrastructure in the public sector; and contributing towards economic growth in the private sector. In the public domain, engineers in the employ of the parastatals have always been involved in the provision of transport, communication and electrification. Those specifically active in the civil engineering field are involved in general urban development and upgrading of infrastructure, and are by and large employed by local or provincial government. In the private sector,

FIGURE 5.1: *Employment trends for engineers, technologists and technicians, 1996–2005*



Source: Quantec 2007

Note: Trends given are average numbers per two-year period.

engineers are working in a wide range of commercial enterprises, including small consulting firms, medium-sized businesses and large multinational companies. There are also sizeable contingents of engineers who are not working in the traditional engineering sector. Many of these are active in the financial and general business sector.

The shifts in employment of engineering professionals in the sectors of the economy between 1996 and 2005 are noteworthy. The fluctuation within sectors is a good illustration of the intra-sectoral factors affecting employment. These factors usually relate to the following: the normal business cycle; the enterprise nature of society – South Africa does not have a planned economy and engineering professionals deploy themselves in sectors for various individually determined reasons; the type of employment arrangements that exist in the industry; and the supply of skills from the higher education sector (Interview 2006c; Steyn & Daniels 2003). Stakeholders in the engineering industry have specifically raised concern about the employment arrangements made through labour brokers, especially for technicians (Interview 2006a; Interview 2006b). Their experience is that labour brokers are not committed to ensuring training and continuity of work for employees who are on their payrolls. In the 1990s, when the economy was going through an operating and maintenance phase, large numbers of technicians were retrenched from state-owned enterprises such as Eskom. Labour brokers absorb these employees, and the tendency is to place them on short contracts in different work environments across sectors.

On average, over the period 1996–2005, about half of engineers and technologists worked in the manufacturing (25.0 per cent) and financial and business services (25.2 per cent) sectors. The significant number of engineers who are employed in the financial and business services sector is an indication of the proportion of consulting engineers working either for large financial and management consulting companies or in smaller independent engineering consulting operations. It is well known that management consultancies often recruit top engineering graduates. The South African Association of Consulting Engineers (SAACE) also reports that, over the years, its membership has grown from 30 individual members in 1952 to 460 firms in 2008, which employ more than 16 500 people in total (SAACE 2008). The large number of engineers working in the financial and business services sector may not apply their technical skills directly, but they assist the industry with risk management through consulting agencies (Interview 2006d).

Construction is a labour-intensive industry that is very dependent on the domestic market, and in which the public sector is dominant. Construction declined throughout the 1990s because of the government's policy of curtailing expenditure. In 2005, however, the construction industry grew at a rate of 4.8 per cent nationally.

The Accelerated and Shared Growth Initiative for South Africa (Asgisa) (GCIS 2006), with a capital investment of about R372 billion for the period 2006–2010 for infrastructure work, will surely stimulate and ensure growth of the construction sector. According to Sam Amod, the president of the South African Institution for Civil Engineering (SAICE), 'the industry is faced with the prospects of a boom in infrastructure construction and industrial projects at a time when its skilled resources are reduced to critical levels and many of its civil engineering professionals are approaching retirement.'[3] Suitably skilled people will be needed to drive the massive infrastructure programme under Asgisa, but current skills shortages in local government will impede the rollout of the programme.

A few initiatives are attempting to address this problem. The Engineering Council of South Africa (ECSA) and the civil engineering profession are assisting local governments by mobilising retired

3 Civil engineering students in demand, *Express* 31 March 2006

engineers to help the staff of local authorities prepare projects for implementation (Interview 2006c). The SAICE and the Local Government Sector Education and Training Authority (LGSETA) are involved in a programme that awards bursaries to technicians who work in local authorities. The SAACE has signed a Memorandum of Understanding with the Department of Provincial and Local Government to provide capacity in the hardest-hit local authorities (Interview 2006d). The strategy is to marry an engineering firm with a local authority in order to build technical and management capacity.

Public and private sectors

A quarter (25.2 per cent) of engineers, technologists and technicians worked in the public sector in 2000 and mostly for state-owned enterprises (Table 5.3). This figure decreased to 24.5 per cent in 2005, as the private sector experienced more growth than the public sector over this period. The average annual growth rate for employment of engineering professionals in the public sector for the period 2000–2005 was 7.7 per cent, compared to 12.1 per cent in the private sector.

The increase in employment at provincial (23 per cent average annual growth) and local (10 per cent average annual growth) government levels is heartening, although 2000–2005 is a short period over which to measure average annual growth. The expansion of infrastructure spending by government over the next few years will lead to further demand for engineering professionals in the public sector but, with the current rate of reported skills shortages, it will not be easy to fill the vacancies. There are around 2 000 vacancies in municipalities in the country, according to Dawie Botha, executive director of the SAICE.[4] It is recommended that they should be filled by teams, each consisting of a recently retired senior engineer and two or three younger graduates (Lawless 2005).

Growth in both categories (engineers/technologists and technicians) is most probably a result of more technologists and technicians being supplied by tertiary institutions, rather than a growth in the number of engineers, as technologist graduations increased by an annual average of 3.7 per cent, technician graduations by 2.5 per cent and engineer graduations by only 1 per cent over the 1996–2005 period (see Table 5.5). Furthermore, over the past few years there has been a decline in the ECSA engineer registration numbers and an increase in the technologist/technician registration numbers.[5] Inexperienced technicians and at times non-technical staff are found running technical departments and project management units where there are no civil engineers – decisions are thus deferred, not made at all or made inappropriately (Lawless 2007). Delays in the supply chain management process have occurred because procurement has become centralised rather than the duty of each department, as indicated by engineers seconded to struggling municipalities.[6]

Engineering professionals working as managers

Following the initial training of an engineering professional, opportunities for leadership positions usually arise very soon. In most contexts this would also involve either a continuation on the technical track or a move to a more managerial and business-focused position. Historically, BSc (Eng) graduate engineers have tended to move more easily into management-level positions than other engineering professionals. The levels of leadership that an engineer would be able to achieve would tend to change over the course of a career. Engineers with approximately 10 years' experience would be likely to be running large teams with specific technical goals, while many of those with something like 20 years' experience would be at the helm of large corporate or public-sector enterprises. On average, more than a quarter (27.4 per cent) of those working in the engineering environment (engineering

4 Universities running empty, *The Star* 9 August 2008
5 SAIMC professional development and training, *SA Instrumentation and Control* February 2005
6 Engineers warn of dire straits in local councils, *Business Day* 2 March 2007

TABLE 5.3: *Distribution of engineers, technologists and technicians, by public and private sector, 2000 and 2005*[a]

Sector	2000			2005			Average annual growth %
	N	%		N	%		
All engineering professionals (engineers, technologists and technicians)							
Central government	2 103	13.93		1 329	6.08		–8.77
Provincial government	1 107	7.34		3 159	14.46		23.32
Local government	1 240	8.22		2 025	9.27		10.30
State-owned enterprises	10 646	70.52		15 338	70.19		7.58
Total public sector	15 097	100.00	25.15	21 851	100.00	24.46	7.68
Private sector[b]	38 088		63.45	67 473		75.54	12.12
Unspecified	6 840		11.40	0.00		0.00	
Total	60 025		100.00	89 324		100.00	8.27
Engineers & technologists							
Central government	2 103	40.27		1 082	10.02		–12.45
Provincial government	370	7.08		828	7.67		17.50
Local government	0	0.00		809	7.50		
State-owned enterprises	2 750	52.65		8 075	74.81		24.04
Total public sector	5 222	100.00	23.51	10 794	100.00	32.37	15.63
Private sector[b]	13 486		60.71	22 552		67.63	10.83
Unspecified	3 504		15.77	0		0.00	
Total	22 212		100.00	33 346		100.00	8.47
Technicians							
Central government	0	0		247	2.24		
Provincial government	738	7.47		2 331	21.08		25.87
Local government	1 240	12.56		1 216	11.00		–0.40
State-owned enterprises	7 896	79.97		7 263	65.69		–1.66
Total public sector	9 874	100.00	26.11	11 057	100.00	19.75	2.29
Private sector[b]	24 603		65.06	44 921		80.25	12.80
Unspecified	3 336		8.82	0		0.00	
Total	37 813		100.00	55 978		100.00	8.16

Source: Quantec 2007

Notes: a. Data for only 2000 and 2005 were compared, as data before 2000 were not available according to the above sector breakdown.

b. Including private associations, private business, and self-employed individuals.

professionals and managers) worked as managers over the period 1997–2005. The number of managers with engineering-related qualifications almost doubled over the period 1997–2005.

Ratios of engineers to population

Lawless (2005) states that there is about 1 engineer for every 3 166 citizens in South Africa, according to the conventional method of calculating this figure – citing the number of professional engineers registered at a specific point in time. But in South Africa we know that very few qualified engineers register with the ECSA because it is not compulsory to do so. The engineer-to-population figure appears more favourable if employment figures rather than registered figures are used. If the number of employed engineers and technologists in 2004 (22 181), according to the 2004 LFS, is used (Quantec 2007), this translates to 1 for every 2 113 people.

Ratios of engineers, technologist and technicians

The ideal ratio for engineers, technologists and technicians has been debated for decades. The ECSA and the Engineering Association of South Africa (EASA) have proposed a ratio of 1 engineer to 1 technologist to 4 technicians to 16 artisans for the South African context (ECSA & EASA 1995). According to Quantec employment data for 1996–2005 (Quantec 2007), the ratio of engineers and technologists to technicians is about 1 : 1.4 (the OHS and the LFS do not differentiate between engineers and technologists).

If the supply ratio of graduate engineers to graduate technologists is applied to the Quantec data for 1996–2005, the ratio of engineers to technologists to technicians is approximately 1 : 0.4 : 1 (Quantec 2007). This means that for every technologist there are just more than two engineers. Such a ratio implies that engineers are under-employed, doing the work of technologists or even technicians in some instances, a fact that has been confirmed by several stakeholders in the engineering industry. The CEO of Aveng, Africa's biggest builder, mentioned that engineering graduates were being deployed to building sites because construction companies could not find enough welders and other workers.[7]

Indications are that technologists with BTech degrees are also frequently being under-utilised, at least in the private sector, and are used in very similar positions to technicians. In the public sector, there does seem to be some evidence that technologists are being fast-tracked to take up positions historically filled by graduate engineers, and according to Table 5.1, there seem to be a substantial number of national diploma graduates who are also employed to do work where engineers are absent. Concerns have been raised about the suitability of this practice (Lawless 2005).

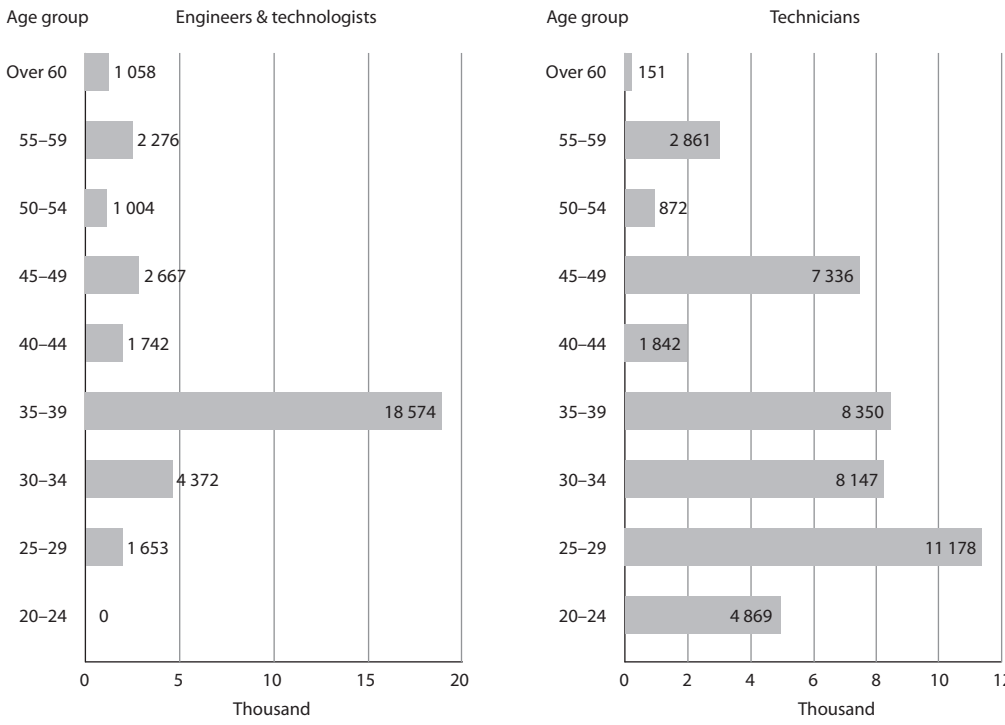
Demographic trends

Employed engineers and technologists had the following race and gender profile in the 1996–2005 period:

- Black representation – comprising Africans, coloureds and Indians – increased from about a fifth (15 per cent) of all *engineers and technologists* for the period 1996–1999 to almost a third (30 per cent) in the 2000–2005 period, an increase of 15 per cent.
- Black *technicians* constituted over a quarter (29 per cent) of technicians for the period 1996–1999, and increased by about 12 per cent to 41 per cent in the 2000–2005 period.
- On average, about 11 per cent of all engineers and technologists were women in the 1996–1999 period, but this figure dropped to under 10 per cent (8 per cent) in the 2000–2005 period, despite

7 Aveng hurt by skills lack, *Business Day* 15 June 2007

FIGURE 5.2: *Age profile of engineers, technologists and technicians, 2005*



Source: Quantec 2007

the fact that the supply of women graduates increased by an annual average of about 15 per cent over the 1996–2005 period (DoE 1996–2005). It is noteworthy that the decrease in the employment of white women engineers and technologists over this period is primarily responsible for this negative trend.

- A slightly bigger downward trend is noticed for women engineering technicians.

In 1997, less than five per cent of people who held a managerial position with an engineering-related qualification were black. This figure increased to just over a fifth (21.4 per cent) in 2005. The trend was less favourable for women. In 1997, only 4.4 per cent of managers were women and this figure only increased to 14.5 per cent in 2005.

Age profiles flicker with red lights (Figure 5.2). In 2005, the greatest density in the population of engineers and technologists was between the ages of 35 and 39 – more than half (55.7 per cent). There is a noticeable shortage of older engineers and technologists – only 13.0 per cent are in the age categories 50–60+. This has a major impact on the transfer of skills to younger engineers and technologists. There is also a shortage of mid-career professionals between the ages of 40 and 49 – this group only consisted of 13.2 per cent of all engineers and technologists in 2005. These engineers and technologists are the ones who, having gained experience, are sought after globally. One of the key issues in the engineering industry at the moment is the lack of mentors.

Engineers are an aging resource worldwide, as indicated by SAACE president, Webster Ndodana.[8] All engineering professionals start out in training positions that are largely technically based. Usually, initial workplace training would fulfil the requirement for professional registration, should it be sought (Hanrahan 2000). Lawless (2005) has found that in a substantial proportion of civil engineering contexts, engineering professionals at this training stage, particularly graduates, are not getting basic supervision and assistance from older professionals. There are too few of the latter, and they have too much work to do to be able to pay attention to the transfer of skills. Anecdotal evidence suggests that this situation also pertains across other engineering disciplinary contexts. Most of the large companies used to operate substantial graduate training programmes for in-depth training, many of which now only exist in a very pared-down format. Graduates are now expected to 'add value' as soon as possible after their entry into the workplace (Adams 2006). Elsewhere in the world, the retirement ages are being raised to retain expertise in order to mentor younger engineers. This might be an option for South Africa as well.

The very low number of 6 000 engineers and technologists younger than 34 in 2005 (Figure 5.2) is also noteworthy. Where have they gone? Statistically, around 2 700 should have been supplied to the market annually over the 1996–2005 period, a total of around 25 000. One explanation could be that most of them have not completed their three-year workplace training as required, and are not working as professional engineers or technologists. LFS data for 2005 show that 6 798 people with engineering degrees worked as technicians (Table 5.1) – this is an example of under-employment (Quantec 2007). Another reason is that young graduates leave South Africa to gain experience abroad. International agreements such as the Washington Accord for engineers and the Dublin Accord for technologists augment this possibility. In addition, engineers traditionally earn less in South Africa than other professionals such as medical doctors and chartered accountants. Urgent attention to upgrading of remuneration to more competitive levels is recommended. Vacancies in the workforce will not be filled unless this issue is attended to. Althea Povey, a former president of the SAACE, explains that it may be that industry does need more engineers but cannot afford to take on young graduates whose training requires time and money, and so the hunt is always for the older, experienced engineers who are scarce.[9]

The age profile for technicians (Figure 5.2) shows that most of the technician workforce (71.4 per cent) is under the age of 40, which makes the task of the very few older technicians to transfer the necessary skills in the workplace virtually impossible to accomplish.

Demand for engineering professionals

Although it is widely reported that there is a shortage of engineering skills in South Africa and our population-to-engineer ratio appears to confirm this, it is difficult to quantify the shortage. The reasons are manifold: the quality of official statistics; double counting of especially engineering professionals in the Sector Skills Plans of SETAs in the face of infrastructure investment; absence of a comprehensive national register of qualified engineering professionals – it is not compulsory for engineering professionals to register with the ECSA; the nature of the world of work for engineering professionals – they are easily absorbed into non-related industries; and unreliable emigration figures – engineering professionals maintain their registration status if registered, regardless of where they are working or what type of work they are doing, and do not always indicate emigration because they leave the country to work on projects for only a short period of time. However, there are certain factors which can be regarded as signs of demand that is outstripping supply: growth in employment of people who are

8 Engineering help for new recruits, *Daily Dispatch* 3 March 2006
9 SAACE president questions assertions on the shortage of engineers, *Inside Track* 3 March 2005

under-qualified (Table 5.1), engineer-to-population ratios, an increase in salaries, and high numbers of vacancies. We discuss each of these factors in turn.

Growth in employment

Data show an absolute employment gain of 40 605 in qualified engineering professionals (engineers, technologists and technicians) for the period 1996–2005, or an average annual growth of 7.0 per cent. This is more than double the average employment growth of 2.7 per cent for the total economy over the past 5 years. However, employment for engineering occupations is expected to increase even more, in line with the massive infrastructure investment by government.

Wage increases

Industry stakeholders are generally reluctant to provide salary data, and quantitative surveys on the matter are, as a rule, confidential and only available to participants. LFS data over the period 1997–2005 show an average annual increase in engineering technicians' salaries of 8.9 per cent and in salaries for engineers and technologists of 12.9 per cent over the 8-year period (Quantec 2007). P-E Corporate Services also reported that the shortage of technical, engineering and manufacturing staff had pushed up the salaries for this group compared to those of other employees.[10] Further evidence in this regard has been provided by engineering recruitment and placement agencies, as well as related professional organisations (Interview 2006d; Interview 2007). Remuneration is especially problematic in the public sector, where engineering professionals earn only a third of what the private sector pays, according to Dawie Botha, executive director of the SAICE.[11]

Vacancies

Vacancy data captured by the Department of Labour (DoL) for the period April 2004–March 2007 (Erasmus 2008) reveal that the number of vacancies increased significantly for all the engineering fields over 2004/05 and 2006/07, but the greatest percentage of vacancies was for mining and electrical engineers and technologists. There is also great demand for South African engineers internationally, as in the past three years an average of 100 to 200 engineers has emigrated, and the ECSA has 1 200 registered engineering professionals with overseas addresses on its database, according to Johan Pienaar, registration manager at the ECSA.[12] The ECSA indicates that engineers are especially drawn to Australia, China and the United Arab Emirates.[13]

Reasons for shortages of engineering professionals

Shortages of engineers are an international phenomenon. Although reasons vary from country to country, and depend to a large extent on each country's economic growth, the declining interest in engineering as a career is a major common factor. Japan, for instance, is running out of engineers and facing a dwindling number of young people entering engineering and technology-related fields.[14] The shortage of engineering teachers in India is even more dire than observers in the USA realise, as reported by Indian academics.[15] In South Africa, there is currently exceptional demand for engineering skills due to massive infrastructural development. At the same time, we are losing experienced

10 Skills shortage 'drives up salaries', *Business Day* 1 June 2007
11 South African universities running on empty, *The Star* 9 August 2008
12 Engineering a response to SA's infrastructure woes, *Business Day* 5 March 2007
13 Exodus – movement of the people, *Sunday Times* 25 February 2007
14 Japan faces engineering shortage, *The New York Times* 18 May 2008
15 The shortage of engineering teachers in India is much worse than observers in the United States are aware, Indian academics report, *EE Times* 17 December 2007

engineers to emigration, in some cases as a result of transformation policies, according to Ann Bernstein, executive director of the Centre for Development and Enterprise,[16] and educational factors such as poor mathematics education at school and low throughput of engineering students at higher education institutions are limiting the supply of engineering graduates. An indicator of such shortages is the growth in the appointment of engineering professionals without proper qualifications (Table 5.1).

Economic factors

Employment trends and demand for engineering professionals were determined to a large extent by the following significant economic drivers in South Africa during the past three decades: the reduction in agriculture and mining shares of GDP; and the relative changes within sectors with respect to labour productivity and capital intensity, such as the recessionary period in the construction industry in the 1980s and 1990s. This led to an outflow of engineering professionals and artisans to other non-related industries in South Africa as well as to global markets. At present, the situation is different. Sustained high economic growth since the start of the 2000s in South Africa, fuelled by the unprecedented boom in global commodity prices, and the government's commitment to increases in infrastructure expenditure over the next 4–5 years, are some of the primary causes of South Africa's skills shortage predicament.

Emigration, mobility and the global economy

The rate of emigration of highly skilled people, and particularly engineering professionals, from South Africa is widely reported to be high. Quantifying this trend is not an easy task, however, due to unreliable data and record-keeping. According to Bhorat et al. (2002), it is noticeable that emigration numbers are usually higher than those recorded in official South African data. They argue that a degree of mobility is necessary if developing countries want to be part of the global economy, but a significant outflow of skilled people can impact on growth and development.

There is a very lively global market for skills, especially for engineering professionals, and it extends further than the developed first-world countries. Some examples are the Middle East and the oil states that are magnets for engineering professionals. The South African Navy is losing engineers to the lucrative oil industries of Angola and Nigeria, as indicated by Johannes Mudimu, Navy Chief.[17] In Europe, where populations are aging and contracting, demographic changes are creating a demand for skills. The skills market is fluid; engineering professionals can move between industries and the global industry offers high salaries.

South African-based employment agencies react to this demand by supplying the desired skills. According to the Joint Chief Executive of the Capital Outsourcing Group, 'South Africans are in such great demand abroad because: they speak English; are hardworking; experienced; multi-skilled; can work in harsh environments; South Africa's longitudinal position makes it easy in terms of time and money for workers to get to their destinations; and it is easier for locals to get visas for African countries.'[18] The ECSA has 1 200 registered engineering professionals with overseas addresses on its database, and about 100–200 engineering professionals emigrate over a 3-year period, says Johan Pienaar, registration manager at the ECSA.[19] The South African Federation of Civil Engineering Contractors confirmed this trend by showing that about a third of South Africa's engineering graduates had worked abroad over the past 40 years.[20]

16 Our obsession with job equity could be costing our economy, *Daily Dispatch* 18 June 2007
17 Navy losing engineers to African oilfields, but training more, *Cape Times* 23 February 2007
18 Labour brokers & flexible staffing solutions, *The Star* 30 January 2007
19 SA's wide engineering gap, *Fin24.com* 21 October 2007
20 Skills shortage 'drives up salaries', *Business Day* 1 June 2007

Lower remuneration than other professions

Engineering professionals earn less than those in some other professions such as medical doctors and chartered accountants. Lower remuneration, as well as an apparent lack of glamour associated with engineering, are regarded as some of the major factors causing skills shortages in the engineering field. Many stakeholders believe that extensive salary increases could serve as an incentive to retain engineering professionals.[21]

Educational issues

A number of educational issues contribute to the shortage of engineering professionals in the long run. Numbers of engineers and technologists are affected by:

- the low numbers of matriculants who pass Grade 12 with higher grade (HG) mathematics and physical science and thus qualify to pursue engineering studies (see further discussion of this in Chapter 1 of this volume);
- the quality of mathematics and science knowledge that those students bring with them into the university context;
- the relative attractiveness of other professional study programmes such as medicine and commerce, which compete for students from the same limited pool of matriculants;
- low throughput rates for higher education.

Lack of experiential training opportunities

The lack of experiential workplace training opportunities for engineering technicians is a big concern and contributes to skills shortages. Lawless (2005) found in her civil engineering study that about 60 per cent of final-year national diploma students who responded to her survey in October and November 2004 had not had experiential training and therefore could not graduate.

Transformation policies

Migration of white engineering professionals out of the state and parastatal sectors due to transformation policies[22] is frequently put forward as a reason for the engineering skills shortages, as also indicated by Marius Fransman, the Western Cape Transport and Public Works MEC;[23] Webster Ndodana, president of the SAACE;[24] Gareth van Onselen, the Democratic Alliance's director of special issues;[25] and Phumzile Mlambo-Ngcuka, the former Deputy President.[26] In general, it has been argued that affirmative action has been pursued too aggressively;[27] that it is too costly, according to Ann Bernstein, executive director of the Centre for Development and Enterprises;[28] that it undermines institutions, according to Gareth Onselen of the Democratic Alliance;[29] that we should be basing appointments on competence and not race, according to Eddie Durant, managing director of Grinaker-LTA;[30] and that we need to debate the impact of employment equity in a mature manner, in the view of Mamphela Ramphele, former managing director of the World Bank (Ramphele 2008). Danai Magugumela, CEO of BKS consulting engineers, adds to this that '[we] need to manage transformation responsibly by

21 Labour brokers & flexible staffing solutions, *The Star* 30 January 2007
22 White exodus, *Citizen* 3 October 2006
23 Engineering a response to SA's infrastructure woes, *Business Day* 5 March 2007
24 'Gebruik die kundige ingenieurs' ['Use the skilled engineers'], *Rapport* 22 January 2006
25 The public service and affirmative action, *SA Government: SA Politics* 12 May 2008
26 Who will build the future when the skills dry up? *Financial Mail* 2005
27 'Get SA out of BEE trouble', *Fin24.com* 07 May 2008
28 Our obsession with job equity could be costing our economy, *Daily Dispatch* 18 June 2007
29 The public service and affirmative action, *SA Government: SA Politics* 12 May 2008
30 Skills shortage is genuine threat to growth, say bosses, *Business Report* 24 May 2007

recognising and retaining exceptional engineering talent, irrespective of race or gender identity'.[31] The South African Institute of Race Relations (SAIRR) found that almost a fifth (1 million) of the white population had left the country in the past 10 years, listing crime and affirmative action as the biggest reasons for the exodus.[32]

In engineering, specifically, the ECSA (2008) has pointed to the dangers of pursuing transformation at all costs. In a press release, the council said it had obtained an interdict against Tshwane Metropolitan Municipality to stop all disciplinary actions against an engineer who had reported to the ECSA that the municipality had appointed inexperienced candidates to accelerate transformation. They were appointed as systems operators at the Tshwane Power Control System, although they had tested poorly prior to their appointment. The engineer believed that this posed a danger to public safety as well as to the lives of the systems operators, but faced disciplinary action at the municipality after reporting the matter in writing to the ECSA. According to the ECSA, the Court ruled that it was the duty of a professional engineer to pay due regard to public safety considerations and disapproved of 'acceleration of transformation at all costs while disregarding safety consideration'; it required 'a sensible balance between transformation and safety' (ECSA 2008).

Viv Crone, the president of the South African Institute of Electrical Engineering, argues that the employment scorecard (to measure black economic empowerment (BEE) according to BEE components such as equity ownership, management, skills development, etc.) works against skills development goals.[33] He argues that the scorecard awards companies more points for board and management representivity than for recruitment and training of junior personnel – the emphasis is on senior people and not on junior appointments. He suggests that flexibility and creativity be applied to the current system to maximise the resources available. There is also the suggestion that it is not the pull of the private sector that makes engineers leave government, but the push of transformation policies and restructuring.[34]

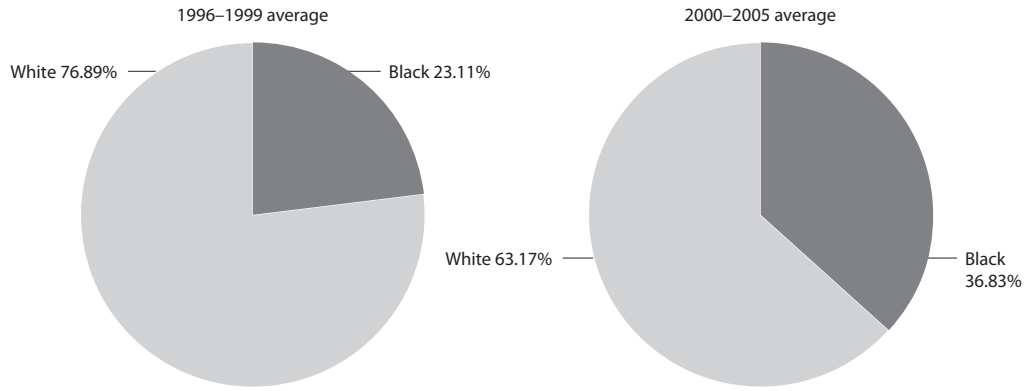
Whatever the reasons, there has clearly been a large drop in employment of white people in the engineering professions. Our own research shows that the proportion of white engineering professionals employed dropped from 76.9 per cent over the 1996–1999 period to 63.2 per cent over the 2000–2005 period (Figure 5.3).

The education of engineering professionals

According to the ECSA it takes about 10–11 years to educate and train an engineer or engineering technologist, starting with good mathematics and physical science education at Grade 9 level at secondary school level, and ending when the three years of workplace experience has been completed. The same principle (although about seven years in duration) is valid for technicians – starting with Grade 9, completing secondary school, then three years of theoretical training plus one year of experiential training. This section explores some of the issues and trends that affect the production of engineering professionals.

31 Engineering transformation: 'retain talent irrespective of race or gender', *Engineering News* 23–29 June 2006
32 Beat the skills trap by employing mentors and mentees, *The Star* 1 February 2007
33 BEE 'hampers training goals', *The Weekender* 25 March 2007
34 It's not about the money, *Mail & Guardian* 19 April 2007

FIGURE 5.3: *Race profiles of engineering professionals, 1996–2005*



Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)

Secondary school education

A universal problem for the engineering profession across the world is the quality of school mathematics and physical science education. In South Africa, the problem is compounded by the historical under-resourcing and poor quality of education for black learners (particularly African and coloured learners) in the apartheid era. This means that few students from the historically black schools achieve the kind of matriculation pass which will enable them to study at a university, let alone gain admission to the high-level programmes such as engineering or medicine.

To study engineering at university a HG mathematics symbol of A, B or C is required, and for most universities of technology a minimum of C-symbol standard grade mathematics is required. These criteria present a challenge. Of the 169 026 candidates who passed mathematics in 2005, 32 112 (19.0 per cent) passed at HG level. Among those who passed mathematics at HG level in 2005, only 4 210 (13.1 per cent) passed with an A symbol, 3 302 (10.3 per cent) passed with a B symbol, 5 296 (16.5 per cent) passed with a C symbol, and 6 342 (19.8 per cent) passed with a D symbol (DoE 2005). The education department aims to increase the number of matriculants with passes in mathematics within the next couple of years. Considerably fewer candidates write physical science. In 2005, only 45 652 (35.3 per cent) passed physical science on the HG. Among those that passed physical science at HG level in 2005, only 3 051 (6.7 per cent) passed with an A symbol, 2 811 (6.2 per cent) passed with a B symbol, 4 703 (10.3 per cent) passed with a C symbol, and 7 536 (16.5 per cent) passed with a D symbol (DoE 2005).

Bot (2006, cited in Breier, Chapter 1 of this volume) has provided a racial breakdown of HG mathematics and physical science passes based on further figures obtained from the DoE for the years 2002 and 2005. She reports that although the numbers of African and coloured learners who wrote HG mathematics increased quite substantially between 2002 and 2005, their pass rates remained below those of Indian and white learners. In 2005, African learners achieved a pass rate of 38.8 per cent and coloured learners one of 74.0 per cent, but the pass rate for Indians was 90.2 per cent and for whites 94.7 per cent. In HG physical science, the pass rate for African learners was 31.9 per cent compared with 71.7 percent for coloured learners, 82.2 per cent for Indian learners and 90.6 per cent for white learners.

Bot (2006) does not provide details of grades (symbols) achieved, but the Centre for Development Enterprise (Bernstein et al. 2007: 27) provided an indication of the low numbers of Africans who qualify

for engineering studies when they reported that in 2004, African learners who passed HG mathematics with a C symbol or above amounted to only 2 406 (0.5 per cent of the total number of Africans who wrote the senior certificate examination).

Reasons for studying engineering

Encouraging more students to take up careers in engineering is not an easy task. The underlying reasons behind career choices are complex. Engineering is not always the exclusive choice of an individual; the family is an important influence in many cases. The European Union Commission Report (2006) reveals that the level of education of the two parents of women engineers has an important influence on their choice of engineering as a study field and career; even more so if they have engineers in their family or close environment. A number of other studies also emphasise the positive effect of a role model on choosing engineering as a career (Carter & Kirkup 1990; Coles 1994; Smith & Erb 1986).

Jawitz and Case (1998) investigated the reasons given for studying engineering by a first-year cohort across the Western Cape. The results were disaggregated according to race and gender. The study showed that financial incentives were mentioned across all groups, with no significant differences between them. White male students made strong mention of practical engineering activities and problem-solving. White female students appeared to be strongly motivated by school experiences and by supportive family environments, while black male and female students seemed to be motivated by opportunities to serve their communities and to prove themselves in careers historically dominated by white men. This latter finding was further supported by a later series of studies amongst mechanical engineering students at the University of Cape Town (Reed & Case 2003).

The European Union Commission Report (2006) found that lack of information was one of the major factors influencing women's consideration of a career in engineering. None of the students interviewed in their 'Womeng Project' had any precise information about the job and the actual activities of an engineer. This means that none of them had a good idea of their future career paths as engineers when they started their training. Usually, training institutions that offer engineering studies have information policies and events to inform potential students about the course. The Report mentions that getting information through personal contact seems to be a decisive factor.

With regard to encouraging more students to take up careers in engineering, again there are no simple solutions. The experience of the civil engineering profession is instructive in this regard. Following periods with low student numbers, they have embarked on unprecedented initiatives to draw in more school learners. There have recently been some increases in the numbers of civil engineering students, but it is not clear whether this can be attributed to these initiatives or whether it is perhaps more as a result of the general economic upturn.[35]

The supply of engineering professionals

In 2005, the enrolment ratios between humanities (including education), business and commerce, and science, engineering and technology were 49% : 26% : 25% (Bot 2006). The recent National Plan for Higher Education (DoE 2001) proposes a shift of enrolments over the next 5–10 years towards the science, engineering and technology (SET) fields. The goal sets ratios of 40% : 30% : 30% respectively. Following the Asgisa initiative, there is anecdotal talk of universities being asked by the government to

35 SA engineers at the ready to deliver vital infrastructure, *Engineering News* 24 March 2006

dramatically increase the size of their engineering faculties. However, it should be taken into account that the pool of potential candidates for higher education institutions has not increased sufficiently, especially in respect of those with HG passes in mathematics and physical science.

Regarding career choice, there has been an insignificant change in the number of students taking up engineering studies at universities in comparison with the dramatic increase in those studying towards an engineering qualification at the universities of technology. Table 5.4 shows that the average annual growth rate in enrolments for the BTech (technologist) for the period 1996–2005 is over 10 per cent (13.9 per cent), compared to 6.1 per cent for NDip (technician) students and 3.9 per cent for BSc (Eng) (engineer) students. The dramatic increase in BTech enrolments is, however, off a low base. The drop in enrolments between 1998 and 2002 specifically for students at the technician level was mainly the result of the fact that the public sector did not offer bursaries over that period in areas such as electrical engineering (Interview 2006e).

Enrolment data (Table 5.4) and graduation data (Table 5.5) obtained from the DoE and the ECSA differ to some extent, as the DoE includes some fields of study under engineering which are excluded by the ECSA. DoE data also include engineering fields of study such as graphic and drafting, engineering mechanics, and engineering science which are excluded by the ECSA. The ECSA includes only nine main fields of study: aeronautical, agricultural, chemical, civil, electrical, industrial, mechanical, metallurgical and mining engineering. The DoE, in addition to the nine main fields of study, also gives a breakdown according to automotive engineering, bio-engineering, computer engineering, environmental engineering, geological engineering, instrumentation, manufacturing engineering, marine engineering, materials engineering, and surveying and mapping, which are sub-fields of study under the ECSA's nine main fields of study.

Graduation trends at universities and universities of technology

There has only been a marginal increase in the absolute number of engineers graduating from universities and technologists and technicians graduating from universities of technology over the 1996–2005 period (Table 5.5).

In 2005, there were a total of 6 568 graduates (under- and postgraduate) in engineering, of whom only 16.18 per cent (1 063) were postgraduates. Among the 5 506 undergraduates in 2005, 52.9 per cent (2 910) were NDip graduates, 26.6 per cent (1 130) were BTech graduates and 20.5 per cent (1 466) were Prof B Degree graduates.

The average annual growth rates for undergraduate engineers, technologists and technicians were only 1.0, 3.7 and 2.5 per cent respectively over the 1996–2005 period. The annual output of engineering professionals has remained almost static, despite the increasing demand for engineering services and replacement of engineering professionals who are retiring from the workforce.

The sharp drop in the number of technician graduations over the 1998–2002 period can be related to the difficulty that students experience in getting access to bursaries and finding industrial placements for their experiential training year (Interview 2006b). Employment agencies contribute to this problem by placing technicians and technologists for short periods with different employers. This means that they do not get the opportunity to work for one employer for the required period of time in order to complete their experiential training and obtain their qualifications (Interview 2006b; Interview 2006d). Lawless (2005) found in her civil engineering study that about 60 per cent of final-year national diploma students who responded to her survey in October and November 2004 had not had experiential training and therefore could not graduate. Some of the reasons put forward to explain this

TABLE 5.4: *Average annual growth rate in undergraduate engineering enrolment, 1996–2005*

Undergraduate enrolment	Source	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
Engineer	HEMIS	7 895	7 850	7 967	6 050	7 188	7 656	8 135	8 901	10 886	11 159	3.92
	ECSA			8 014	5 548	6 524	6 845	7 166	7 861	8 613		
University of technology	HEMIS	22 265	25 691	25 564	20 831	23 904	25 908	26 760	28 538	31 772	40 784	6.96
	ECSA			21 984	13 944	16 774	19 586	18 090	20 814	28 690		
Technician	HEMIS	20 426	23 188	22 965	17 993	17 270	15 231	16 157	20 926	27 033	34 874	6.12
Technologist	HEMIS	1 840	2 503	2 599	2 838	6 635	10 676	10 603	7 612	4 739	5 910	13.85
Total	HEMIS	30 160	33 541	33 531	26 881	31 092	33 563	34 895	37 439	42 657	51 944	6.23
	ECSA			29 998	19 492	23 298	26 431	25 256	28 675	37 303		

Sources: DoE 2005; ECSA 2008

Notes: HEMIS = Higher Education Management Information System; ECSA = Engineering Council of South Africa; DoE data include engineering fields of study which are excluded by the ECSA, such as graphic and drafting, engineering mechanics, and engineering science.

TABLE 5.5: *Average annual growth rate of undergraduate engineering graduations, 1996–2005*

Qualification	Source	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
NDip	HEMIS	2 330	2 189	2 140	1 947	1 385	1 710	2 104	2 196	2 564	2 910	2.50
BTech	HEMIS	812	756	691	564	433	641	687	772	952	1 130	3.73
Combined total (NDip & B Tech)	HEMIS	3 142	2 945	2 831	2 511	1 818	2 351	2 791	2 968	3 516	4 040	2.83
	ECSA			2 341	1 404	1 292	1 814	1 956	2 284	3 160		
B Degree	HEMIS	1 341	1 243	1 277	1 051	1 292	1 286	1 306	1 354	1 424	1 466	1.00
B (ENG)	ECSA			1 226	995	1 235	1 274	1 691	1 305	1 177		
Total	HEMIS	4 483	4 188	4 108	3 562	3 110	3 637	4 097	4 323	4 940	5 506	2.31
	ECSA			3 567	2 399	2 527	3 088	3 647	3 589	4 337		

Sources: DoE 2005; ECSA 2008

Notes: HEMIS = Higher Education Management Information System; ECSA = Engineering Council of South Africa; DoE data include engineering fields of study which are excluded by ECSA, such as graphic and drafting, engineering mechanics, and engineering science.

trend were: employers' concern regarding the quality of the training of students; the location of some universities of technology poses a problem in terms of access to employers because many students do not have the financial means to travel to centres to look for work; limited assistance from universities of technology in finding job opportunities for students; resistance of businesses to employing inexperienced students and the revision of labour laws adding to the resistance of businesses to taking on employees who cannot add immediate value to their organisations. Lawless argues for the conversion of the national diploma in civil engineering to a learnership, to ensure that industry is compensated for its involvement in training.

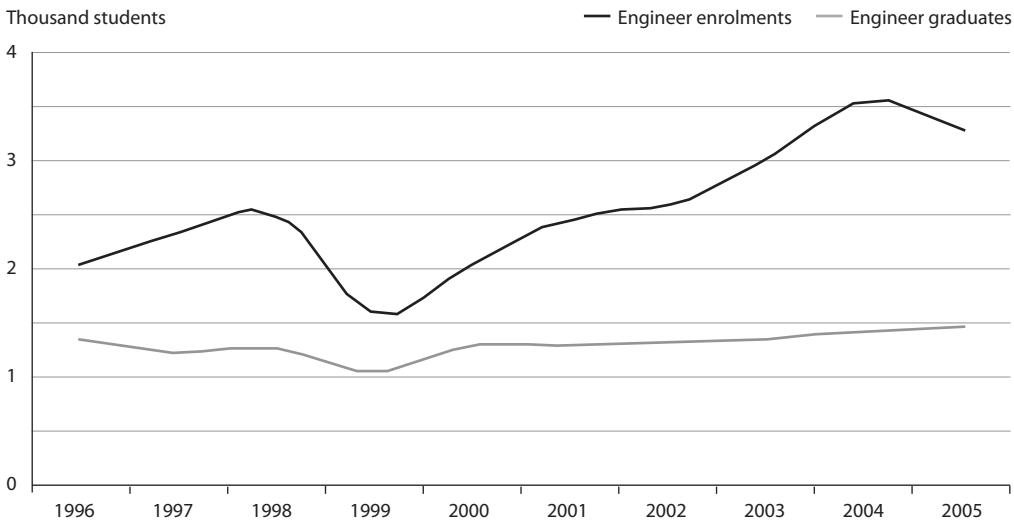
Throughput trends at universities and universities of technology

The throughput rates needed in order to supply the 1 466 engineering graduates at universities and the 4 039 engineering graduates at the universities of technology are very poor. If you consider that the BSc (Eng) is designed to take four academic years, the national diploma three years, and the BTech one additional year after the national diploma, it is clear that throughput rates are far from optimal. In order to determine throughput, enrolments are compared to graduations three and four years later. Although this method is useful from a comparative point of view, it is not a precise measurement as first-year enrolments will include those who are repeating, and final-year graduations will include those who are graduating after five or more years of study. Figures 5.4 and 5.5 show the throughput trend for first-time entering engineers, Figures 5.6 and 5.7 for first-time entering technologists, and Figures 5.8 and 5.9 for first-time entering technicians.

The throughput of first-time entering engineers qualifying at universities stayed static at about 60 per cent between 1999 and 2005. For first-time entering technicians the average throughput rate over the same period was only 40 per cent and for first-time entering technologists about 55 per cent. According to Lawless (2005), there are a few factors that may have contributed to the low throughput rates. These factors include the following: previously disadvantaged learners were encouraged to enter tertiary education without the application and enforcement of entrance criteria; learners who entered had poor grounding in mathematics and physical science and lacked fluency in the language of instruction; not all institutions were ready to offer supplementary or bridging courses to prepare these learners for tertiary education; the increase in enrolments caused problems in terms of the size of classes, and extra staff were taken on who had inadequate qualifications; black students struggle to afford tertiary education unless they obtain loans or bursaries, and when they try to fund themselves, problems occur; and the biggest dropout takes place at the universities of technology where students are required to do workplace training before qualifying, since sufficient opportunities are not always available. Students at the universities of technology report that they find it difficult to find industrial placements for their experiential training year. Students are only awarded the national diploma after completion of this training as well as four semesters of academic work, and it appears that many students are unable to complete the diploma for lack of this work experience. With the economic pressures on companies, together with a shortage of experienced professionals, they seem to be less willing to take on personnel who require training such as in-service trainees from the universities of technology. Higher education institutions are trying to address the poor throughput rate by applying the following strategies (Interview 2007b; Lawless 2005):

- Rigorous entrance criteria – some of the universities that achieve the highest throughput rates are known to apply the most stringent entrance criteria and procedures.
- Dedicated foundation or bridging programmes and extended programmes – institutions have established foundation programmes to help students to deal with the challenges of tertiary education. Some universities have decided to extend the engineering programme by converting the four-year degree to a five-year degree.

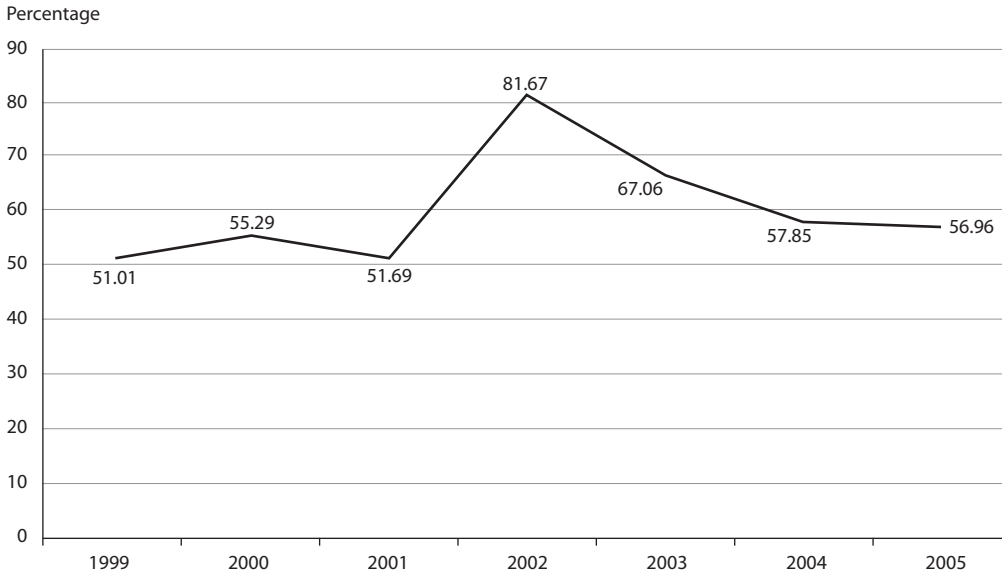
FIGURE 5.4: *Engineers – number enrolled[a] and graduated[b], 1996–2005*



Source: DoE 1996–2005

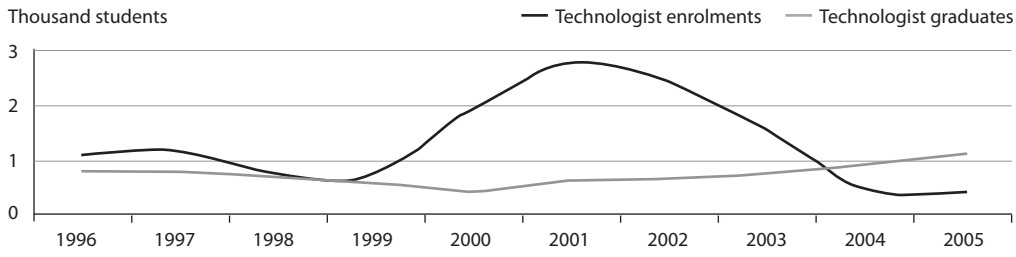
Notes: a. First-year enrolled; b. Graduation four years later

FIGURE 5.5: *Percentage graduations in relation to enrolments four years earlier, 1999–2005*



Source: DoE 1996–2005

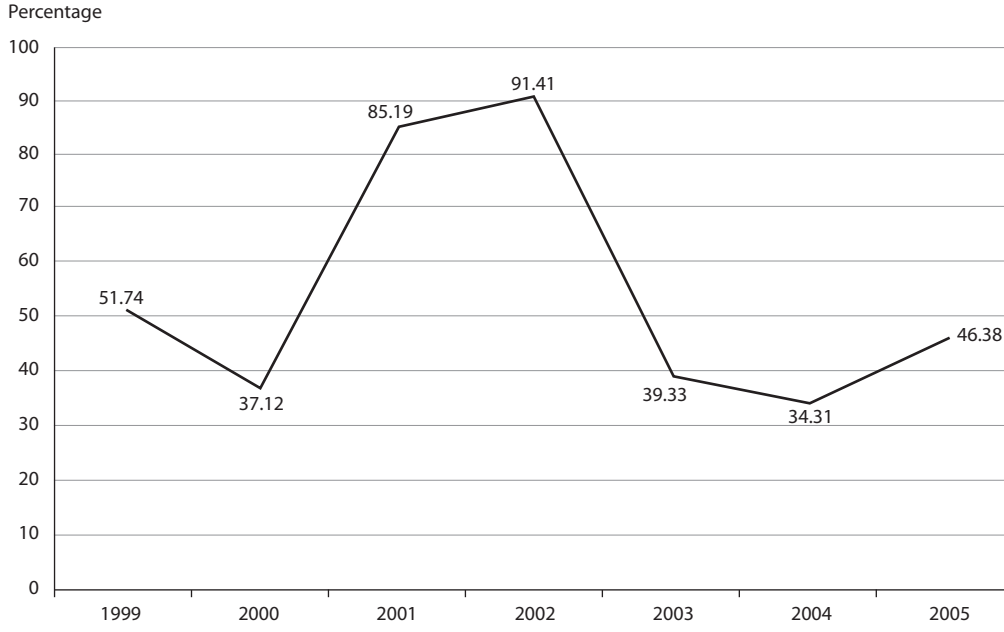
FIGURE 5.6: *Technologists – number enrolled[a] and graduated[b], 1996–2005*



Source: DoE 1996–2005

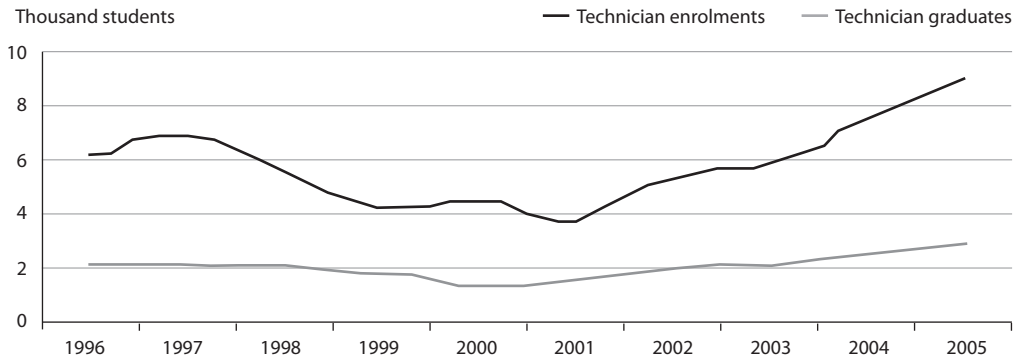
Notes: a. First-year enrolled; b. Graduation four years later

FIGURE 5.7: *Percentage graduations in relation to enrolments four years earlier, 1999–2005*



Source: DoE 1996–2005

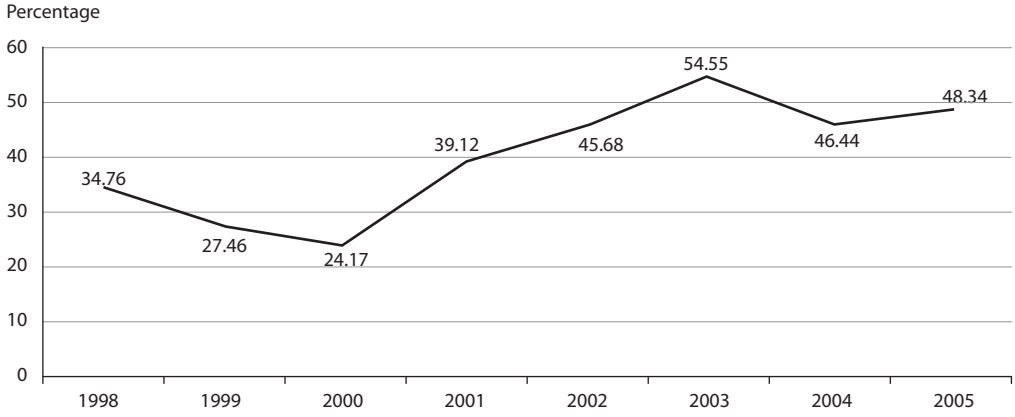
FIGURE 5.8: *Technicians – number enrolled[a] and graduated[b], 1996–2005*



Source: DoE 1996–2005

Notes: a. First-year enrolled; b. Graduation three years later

FIGURE 5.9: *Percentage graduations in relation to enrolments three years earlier, 1998–2005*



Source: DoE 1996–2005

- Funding – many students do not have the financial means to afford training at a higher education institution. In these instances, the institutions strive to assist the students to obtain loans and bursaries.
- Monitoring and support – support is given by means of supplementary lessons, assigning a senior student as a mentor to the student, and providing students with life skills training.
- Introducing students to young graduates as role models – students are encouraged to communicate with young graduates and to join professional associations in order to obtain access to people who can provide them with advice.
- Appointing more lecturers – in some institutions the staff-to-student ratios are too low because of an increase in enrolments. Additional staff are then appointed.
- Upgrading of the qualifications of lecturers, especially at universities of technology.

Maree et al. (2003) note that engineering students who perceive their environment to be supportive, who know where to find help, and who do not struggle with the language of mathematics, are more likely to be successful. Pitt (2002) argues that students in higher education need an assortment of strengths, including motivation to be successful in their studies.

The Joint Initiative on Scarce Skills for South Africa (Jipsa) business plan (Jipsa 2006) suggested that the supply of engineering professionals could be increased by an additional 1 000 per annum. The authors of the plan came to this conclusion after a consultation process with deans of the faculties of engineering and the built environment at universities. Jipsa is expecting that the output in the form of registered professionals will increase by 1 000 over and above current output, without a significant increase in the inputs. The 1 000 target could include other construction-related professions such as construction and project management, quantity surveying and architecture.

Graduation trends

Table 5.6 reports the graduation trends for engineering disciplines at universities and universities of technology over the 1996–2005 period. There was an improvement in engineering graduations in some disciplines between 1996 and 2005. One of the factors contributing to a shortage in graduations in certain scarce disciplines is the fact that tertiary institutions are struggling to retain quality teaching and research staff in disciplines that compete with demand in the private sector (Interview 2006f).

Although small (3.3 per cent average annual growth), the growth in electrical engineering graduations over the 1996–2005 period is encouraging, seen against the background of the expansion plans of Eskom in regard to building new power stations and the reported shortages in municipalities.

Graduations in civil engineering experienced an average annual growth of only 2.4 per cent over the 1996–2005 period. This low growth may not be sufficient, given the huge capital investment in infrastructure by the government. A major beneficiary of this investment is construction in general, and civil engineering in particular. It will take some years for the South African construction industry to overcome its current skills shortages in this sector. The specialised skills pool of bridge-building in South Africa has, for example, been severely depleted, as several experienced bridge engineers have been lost to emigration and retirement, according to Pieter Louw of PA Louw and Associates.[36]

The automotive industry is the third-largest and most expanding sector in the South African economy,[37] but there was negative growth in automotive and mechanical engineering graduations over the 1996–2005 period. Mechanical engineers are needed in most sectors of the economy and especially in the automotive industry (Interview 2006f; Interview 2006g). The low number of graduations of automotive technologists and technicians is very discouraging, and this fact needs to be addressed if the South African automotive industry wants to continue focusing on further improvements in competitiveness in terms of production and quality, according to Nico Vermeulen, the director of the National Association of Automobile Manufacturers of South Africa (NAAMSA).[38] 'Component manufacturers ideally require high local content and high-volume domestic production to grow the automotive industry,' according to Dr Justin Barnes, MD of the consultancy, Benchmarking and Manufacturing Analysts.[39] It is fortunate that NAAMSA is planning programmes to increase technical/autotronics and commercial skills development in the automotive industry.[40] The Nelson Mandela Metropolitan University has also introduced a BEng degree in mechatronics.

36 With bridge-building prospects improving, SA mulls skills-death challenge, *Engineering News* 7 July 2006
37 Auto industry prospects for 2006, *Engineering News* 10 March 2006
38 Auto industry prospects for 2006, *Engineering News* 10 March 2006
39 When MIDP ends, will South Africa still have an auto industry? *Engineering News* 17 March 2006
40 Beat the skills trap by employing mentors and mentees, *The Star* 1 February 2007

TABLE 5.6: *Graduation trends in engineering fields of study, 1996–2005*

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
Fields of study (undergraduate)											
Electrical	1 412	1 317	1 349	1 157	971	1 164	1 348	1 517	1 666	1 890	3.30
Civil	725	648	683	694	639	674	731	720	875	898	2.40
Mechanical	803	754	702	524	453	603	587	610	616	743	−0.86
Chemical	496	422	459	305	437	516	498	541	664	640	2.87
Industrial	347	397	264	197	154	201	208	233	309	372	0.77
Metallurgical	137	95	102	78	85	108	77	100	111	196	4.03
Mining	125	142	172	99	42	39	47	53	65	156	2.49
Surveying	116	110	81	108	83	68	67	75	69	83	−3.60
Materials	71	78	98	66	38	50	68	65	83	79	1.21
Computer	44	45	97	0	4	3	45	88	139	112	10.88
Engineering mechanics	0	0	0	60	67	14	131	63	101	85	5.82[a]
Marine	13	7	26	16	13	25	36	49	51	50	16.15
Graphics	0	0	0	75	10	1	21	29	29	60	−3.77[a]
Aerospace	83	54	13	5	4	4	7	11	16	9	−21.87
Bio-engineering	0	0	0	0	0	52	69	64	10	9	−36.42[b]
Agriculture	29	31	15	17	16	17	21	21	16	19	−4.82
Environmental	0	0	0	24	26	32	27	34	29	11	−12.38[a]
Manufacturing	0	0	0	16	17	8	18	4	0	16	0.53[a]
Engineering science	0	0	0	3	0	0	27	3	3	0	0
Instrumentation	0	0	0	6	0	0	1	1	0	0	0
Automotive	0	0	0	3	0	0	0	0	1	2	−8.91[a]
Geological	0	0	0	1	0	0	0	0	0	0	0
Other engineering & engineering technology	83	88	47	109	51	59	64	44	90	79	−0.57
Total under-graduates	4 483	4 188	4 108	3 562	3 109	3 636	4 097	4 323	4 941	5 506	2.31
Total post-graduates	576	682	673	728	842	826	892	932	998	1 063	7.05
Combined total	5 059	4 870	4 781	4 289	3 951	4 463	4 989	5 255	5 939	6 568	2.94

Source: DoE 1996–2005

Notes: a. 1999–2005; b. 2001–2005

The positive growth in chemical engineering graduations over the 2000–2005 period after a decline over the 1996–1999 period is encouraging, given that chemical engineering is very versatile and chemical engineers can be employed as petroleum engineers, metallurgical engineers or in the minerals and mining industry. Petronet aims to be the foremost operator and maintenance partner for all future liquid fuel and gas pipelines and related facilities in southern Africa (Department of Public Enterprises 2006). Furthermore, an upturn of activity in the southern African offshore oil and gas industry has increased demand for specialised offshore services that are essential to overall safety and integrity.[41] With forthcoming environmental legislation and new emphasis being placed on environmental protection in South Africa, more graduations in environmental engineering will be necessary.[42]

The increase in mining and metallurgical engineering graduations could be attributed to the growing availability of bursaries in this field, especially for black students (Interview 2006g). Historically, the gold mining industry has been a significant employer of engineers, but employment levels have decreased substantially in recent years.

The number of computer engineering graduations grew from 44 in 1996 to 112 in 2005, but it is still difficult to find computer engineers with the right skills, especially with security, internet protocol telephony and wireless networking skills.[43] According to Asgisa, electronic communications will be one focus of priority attention in growing South Africa's broadband network; in completing a submarine cable project to provide international access; and in establishing telecommunications, especially in the rural areas of the country (GCIS 2006). According to research findings by the Industrial Development Corporation, the demand for networking skills outstrips supply by far.[44]

The negative growth in agricultural engineering graduations is a concern in a country like South Africa where agricultural engineering can contribute to increased productivity to address food shortages and job creation (Berry 2006).

Overall, there has been negative growth in the number of aerospace/aeronautical graduations (engineers, technologists and technicians combined). However, there has been positive growth (9.05 per cent average annual growth over the 1997–2005 period) in aerospace/aeronautical graduations of engineers specifically (which excludes the negative growth for technologists and technicians). This is encouraging in light of the expected doubling in the number of air passengers in the next 10 years and its tripling within 15 years.[45] The South African Minister of Public Enterprises has commented on the government's keenness to make South Africa a centre for aerospace manufacturing.[46] However, the same positive trend is not noted for aerospace/aeronautical technologists and technicians. There is a shortage of aeronautical technicians in the air force and unqualified technicians have to stand in and do the work of qualified aeronautical technicians.[47] The decrease in graduations for aeronautical technical courses is thus disappointing.

According to Professor Ricardo Hausmann, a Harvard University economist,[48] South Africa needs to generate jobs in the export-orientated manufacturing sector to make growth sustainable, as declines

41 Specialised services are in great demand, *Engineering News* 10 June 2005
42 Engineered technology division well positioned for new business, *Engineering News* 26 November 2004
43 SA needs 70 000 techies, *Citizen* 7 July 2006
44 Specialised services are in great demand, *Engineering News* 10 June 2005
45 SA's Airbus designer tells how he started with just a matric, *Daily Dispatch* 24 March 2006
46 Investment in technology key to competitiveness, *Engineering News* 2 June 2006
47 Lugmag: Tegnici 'nie opgelei', herstelwerk maak vliegtuie 'tydbomme' ['Air Force: Technicians "not trained", repair work turns aircraft into "time bombs"'], *Die Burger* 17 March 2006
48 Export-orientated manufacturing key to meeting SA growth target – Harvard economist, *Engineering News* 11 August 2006

in most developing countries' growth have coincided with collapses in exports. He argues that economic growth based on growth in the construction sector is an unsustainable strategy. The decline in manufacturing engineering graduations is thus disappointing.

Racial transformation

Enrolments

The democratisation of South Africa introduced a dramatic transformation in the student intake at historically white higher education institutions. The increase in the proportion of enrolment (for national diplomas, bachelor of technology and professional bachelor of engineering degrees) of black engineering students – comprising African, coloured and Indian students – compared to white students is proof of this, as shown in Table 5.7.

The number of white engineering, technologist and technician enrolments (taken together) decreased by an annual average of 1.6 per cent between 1996 and 2005 – there were 12 494 white students enrolled in 1996 and 10 840 white students enrolled 9 years later in 2005 (a drop of 13.2 per cent). The average annual growth rate of enrolments for Africans (across the same three categories) was the highest – 11.4 per cent for African engineering students compared to 4.2 per cent for coloured and 3.2 for Indian engineering students.

Considering engineering (university) enrolments alone, there was practically no growth (average annual growth of 0.55 per cent) in the number of white engineer enrolments over the 1996–2005 period. In 1996, 23.2 per cent (1 828) of engineer enrolments were African, while in 2005, this figure had increased to over a third (3 951). The figures for coloured and Indian engineer enrolments did not change much over this period.

In 1996, 20.3 per cent (373) of enrolments for technologists were African. By 2005, this figure had increased to 66.0 per cent (3 902). The annual average increase in African enrolments was 30.0 per cent. Coloured and Indian technologist enrolments increased by an average annual rate of 8.8 per cent and 11.4 per cent respectively. White technologist enrolments increased by an annual average rate of only 0.88 per cent over this period.

The number of white technician enrolments decreased by an annual average rate of 4.0 per cent over the 1996–2005 period and that of Indian enrolments by 0.9 per cent. The enrolment of coloured technician students increased at an annual average rate of 3.6 per cent, while African technician enrolments increased at an annual average rate of 10.5 per cent. The numbers of African technician enrolments increased nearly one-and-a-half times (146.4 per cent) from 10 986 to 27 072, bringing the proportion of African technical enrolments from 53.8 per cent in 1996 to 77.7 per cent in 2005.

Graduations

Table 5.8 displays the graduation trends of all engineering qualifications according to race in the period 1996–2005. Considering engineer, technologist and technician graduations together, the number of African graduations across all three categories increased by an average annual growth rate of 13.5 per cent and Indian graduations by 2.7 per cent in this period. Conversely, the number of white engineer graduations decreased by an annual average rate of 5.0 per cent – there were 2 886 white engineering graduates in 1996 and only 1 820 nine years later in 2005. Coloured engineering graduations also decreased by an average annual rate of 1.4 per cent over this period, from 326 in 1996 to 288 in 2005.

TABLE 5.7: *Average annual growth rate of undergraduate engineering professional enrolments, by race, 1996–2005*

Enrolments	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
Engineers											
African	1 828	2 046	2 212	1 884	2 043	2 257	2 485	2 903	3 761	3 951	8.94
Coloured	279	258	273	225	229	248	271	299	357	381	3.53
Indian	970	1 067	1 086	486	1 099	1 168	1 241	1 428	1 836	1 748	6.76
White	4 818	4 479	4 396	3 455	3 816	3 983	4 137	4 268	4 928	5 062	0.55
Total	7 895	7 850	7 967	6 049	7 187	7 655	8 134	8 897	10 883	11 143	3.90
Technologists											
African	373	658	905	1 125	3 712	7 214	7 267	4 797	3 019	3 902	29.81
Coloured	159	192	185	177	273	316	375	340	290	342	8.84
Indian	160	273	263	319	502	477	500	391	385	424	11.42
White	1 148	1 381	1 246	1 201	2 148	2 670	2 461	2 084	1 044	1 242	0.88
Total	1 840	2 503	2 599	2 822	6 635	10 676	10 603	7 612	4 738	5 908	13.84
Technicians											
African	10 986	13 533	15 024	11 552	12 787	10 857	11 699	16 178	21 083	27 072	10.54
Coloured	1 246	1 285	1 521	1 167	962	1 213	1 347	1 402	1 519	1 717	3.63
Indian	1 665	2 084	1 086	1 129	1 080	1 095	1 126	994	1 164	1 540	–0.86
White	6 529	6 286	5 334	4 077	2 429	2 057	1 984	2 352	3 257	4 536	–3.96
Total	20 426	23 188	22 965	17 925	17 258	15 221	16 156	20 926	27 023	34 865	6.12
All engineering professionals											
African	13 187	16 238	18 141	14 561	18 541	20 328	21 451	23 878	27 863	34 924	11.43
Coloured	1 684	1 734	1 978	1 569	1 464	1 776	1 993	2 040	2 166	2 440	4.20
Indian	2 795	3 424	2 435	1 933	2 681	2 740	2 867	2 813	3 385	3 712	3.20
White	12 494	12 146	10 976	8 732	8 393	8 709	8 583	8 704	9 230	10 840	–1.57
Total	30 160	33 541	33 531	26 796	31 079	33 552	34 893	37 435	42 643	51 915	6.22

Source: DoE 1996–2005

TABLE 5.8: *Average annual growth rate of undergraduate engineering professional graduations, by race, 1996–2005*

Engineering undergraduates	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	average annual growth %
Engineers											
African	126	151	201	210	252	272	277	307	329	363	12.50
Coloured	55	40	39	37	40	47	46	36	36	44	−2.45
Indian	126	145	129	61	170	165	165	170	202	173	3.59
White	1 035	907	908	742	830	803	818	841	858	887	−1.70
Total	1 341	1 243	1 277	1 051	1 292	1 286	1 306	1 354	1 424	1 466	1.00
Technologists											
African	126	126	157	137	127	262	275	337	498	604	19.01
Coloured	44	39	53	33	37	40	63	59	65	71	5.53
Indian	52	42	49	65	52	65	82	83	85	72	3.72
White	591	548	432	329	217	273	267	294	305	383	−4.71
Total	812	756	691	564	433	641	687	772	952	1 130	3.73
Technicians											
African	707	764	923	1019	754	953	1259	1460	1739	2033	12.45
Coloured	227	135	135	173	110	155	195	201	199	174	−2.95
Indian	135	188	75	97	94	76	74	49	126	153	1.34
White	1 260	1 102	1 006	658	428	526	576	486	501	551	−8.78
Total	2 330	2 189	2 140	1 947	1 385	1 710	2 104	2 196	2 564	2 910	2.50
All											
African	959	1 041	1 281	1 366	1 133	1 488	1 811	2 104	2 566	3 000	13.51
Coloured	326	214	227	243	186	241	304	297	299	288	−1.35
Indian	313	375	253	224	315	306	321	301	412	398	2.69
White	2 886	2 558	2 347	1 729	1 474	1 601	1 661	1 621	1 663	1 820	−4.99
Total	4 483	4 188	4 108	3 562	3 109	3 636	4 097	4 323	4 941	5 506	2.31

Source: DoE 1996–2005

Considering engineer (university) graduates alone, the number of African engineer graduates almost tripled, albeit from a low base – from 126 in 1996 to 363 in 2005. This amounted to an annual average growth rate of 12.5 per cent. The number of Indian engineer graduates increased from 126 to 173 over this period, an annual average growth rate of 3.6 per cent. The number of white engineer graduates decreased from 1 035 to 887 at an average annual rate of 1.7 per cent, and coloured engineer graduates decreased from 55 to 44, at an average annual rate of 2.5 per cent.

African technologist graduations increased dramatically from 126 to 604, at an average annual growth rate of 19.0 per cent, while white technologist graduations decreased at an annual average rate of 4.7 per cent. Coloured and Indian technologist graduations also increased over this period at a 5.5 per cent and 3.7 per cent average annual growth rate respectively.

African technician graduations nearly tripled in this period, from 707 in 1996 to 2 033 in 2005. This amounted to an average annual growth rate of 12.5 per cent. The number of Indian technician graduations increased 13 per cent in this period, from 135 to 153, while coloured technician graduations decreased 23 per cent from 227 to 174 over the same period. White technician graduations showed the greatest decrease – a 56.3 per cent drop from 1 260 in 1996 to 551 in 2005.

Gender transformation

Enrolments

In terms of gender transformation, there has been a related but more limited growth in the participation of women engineering students over the 1996–2005 period. The professional engineering environment can be described as a man's world. Despite many initiatives, ranging from dedicated recruitment and selection to the establishment of support groups for women students at training institutions, they are still under-represented in the engineering field. Professor Lacquet, the first woman dean of an engineering faculty in South Africa, holds the opinion that it is not necessary to reach for a goal of 50 per cent women engineering students, reminding us that not 50 per cent of all nurses are men.[49]

The enrolment of female engineering students (all three categories together) more than tripled from 1996 (3 341 women students) to 2005 (11 801 women students), indicating an average annual growth of 15.1 per cent over this period. In comparison, the enrolment of male engineering students only increased by an average annual rate of 4.6 per cent – there were 26 820 men students enrolled in 1996 and 40 142 in 2005. Proportionally, women constituted only 11.1 per cent of total engineering enrolments in 1996, but by 2005 more than a fifth (22.7 per cent) of all three categories of enrolments were women.

Table 5.9 shows the enrolment trends separately for male and female engineer, technologist and technician students. The following trends can be highlighted:

- The enrolment of women engineer students almost tripled from 1996 (839) to 2005 (2 357), indicating an average annual growth rate of 12.2 per cent over this period. In 1996, enrolment of women engineer students constituted just a tenth (10.6 per cent) of all engineer students, compared to about a fifth (20.0 per cent) in 2005.
- The enrolment of women technologist students increased from 112 to 1 180 over the 1996–2005 period, showing an average annual growth rate of 29.9 per cent. Proportionally, women technologist

49 Meer werk as mense, sê ingenieurs se eerste vroue-dekaan [More work than people, says engineers' first woman dean], *Rapport* 25 March 2007

TABLE 5.9: *Average annual growth rate of undergraduate engineering professional enrolments, by gender, 1996–2005*

Undergraduate engineering enrolment	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
Engineers											
Male	7 056	6 941	6 963	5 192	6 073	6 316	6 598	7 093	8 626	8 802	2.49
Female	839	909	1 003	857	1 114	1 339	1 537	1 808	2 259	2 357	12.17
Technologists											
Male	1 728	2 359	2 454	2 567	5 631	8 717	8 502	6 172	3 785	4 730	11.84
Female	112	144	145	271	1 004	1 960	2 101	1 440	954	1 180	29.92
Technicians											
Male	18 035	20 165	19 446	15 133	13 719	1 1676	12 208	1 5750	20 258	26 610	4.42
Female	2 390	3 024	3 519	2 857	3 549	3 551	3 949	5 176	6 775	8 264	14.78
Total male enrolment	26 820	29 465	28 864	22 893	25 423	2 6710	27 309	2 9015	32 669	40 142	4.58
Total female enrolment	3 341	4 076	4 666	3 985	5 667	6 850	7 586	8 424	9 988	11 801	15.05
Combined total	30 160	33 541	33 531	26 878	31 090	33 559	34 895	37 439	42 657	51 943	6.23

Source: DoE 1996–2005

student enrolments comprised less than 10 per cent (6.1 per cent) in 1996 compared to a fifth (20.0 per cent) in 2005.

- For women technician enrolments, the annual growth rate over the same period averaged 14.8 per cent. In 1996, just more than a tenth (11.7 per cent) of all technician enrolments were women, while in 2005, this figure increased to almost a quarter (23.7 per cent).

Graduations

The number of female engineering graduations (all three categories together) more than tripled from 1996 (331 women graduates) to 2005 (1 198 women graduates), indicating an average annual growth of 15.4 per cent over this period (Table 5.10). This appears to be significant growth, but one needs to bear in mind that it is from a very small base. In comparison, the number of male engineering graduates increased by an annual average of only 0.4 per cent – there were 4 153 male engineering graduates in 1996 and only 155 more (4 308) 9 years later in 2005. Proportionally, women engineering graduates comprised less than a tenth (7.4 per cent) of all engineer graduates in 1996. In 2005, this figure had increased to just more than a fifth (21.8 per cent).

Table 5.10 shows the graduation trends for men and women engineers, technologists and technicians separately:

- In 1996 only 129 women engineers graduated from universities. In 2005, this figure increased to 328, indicating an average annual growth rate of 10.9 per cent over this period.
- Only 43 women technologist students graduated in 1996 compared to 221 in 2005, indicating an average annual growth rate of 19.9 per cent.
- The proportion of female engineer, technologist and technician graduates relative to male engineer, technologist and technician graduates was similar in all three categories, seen separately. Women constituted less than 10 per cent of each type of graduate in 1996 compared to about one fifth in 2005.

Conclusion

The country is embarking on a massive and very expensive expansion in infrastructure, partly in preparation for its hosting of the FIFA World Cup, while at the same time facing a shortage of engineering capacity, particularly in the public sector, that has been described as one of the worst capacity and scarce skills crises in years. The capacity problem in engineering is, however, a worldwide phenomenon. Japan, for instance, is running out of engineers and facing a dwindling number of young people

TABLE 5.10: *Average annual growth rate of undergraduate engineering professional graduations, by gender, 1996–2005*

Engineering graduations	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth %
Engineers											
Male	1 212	1 119	1 146	920	1 130	1 098	1 103	1 128	1 156	1 139	–0.69
Female	129	124	132	131	162	189	204	227	268	328	10.89
Technologists											
Male	769	712	651	506	372	531	575	643	759	909	1.87
Female	43	44	40	58	60	110	113	129	193	221	19.89
Technicians											
Male	2 172	2 036	1 926	1 721	1 157	1 341	1 700	1 715	1 932	2 260	0.44
Female	159	154	213	226	228	369	404	482	632	650	16.97
Total male graduates	4 153	3 867	3 723	3 147	2 659	2 969	3 377	3 486	3 847	4 308	0.41
Total female graduates	331	321	385	415	450	667	720	837	1 094	1 198	15.37
Combined total	4 483	4 188	4 108	3 562	3 109	3 636	4 097	4 323	4 941	5 506	2.31

Source: DoE 1996–2005

entering engineering and technology-related fields.[50] The shortage of engineering teachers in India is even more dire than observers in the USA recognise, as reported by Indian academics.[51] Issues such as migration, equity, lack of experiential training opportunities, shortage of mentors, and the expansion of infrastructure spending complicate the matter in South Africa.

An increase in employment of engineering professionals is reported over the 1996–2005 period. However, this growth was at a low rate. Furthermore, most engineering professionals worked in the financial and business services sectors where they did not always apply their technical skills, but assisted with risk management in the industry through consulting agencies. The construction industry has grown during the past few years in response to infrastructure expansion. This has led to a greater than ever demand for engineering professionals in the public sector.

Progress in racial transformation is visible in graduation and employment figures. However, the employment of female engineers, technologists and technicians shows a decrease during the 1996–2005 period and the under-representation of women in the engineering labour market remains an issue. A major shortage of older and experienced professionals is noticeable, which impacts on the transfer of skills to the younger generation of engineering professionals.

Although the role of employment equity criteria in rectifying the racial imbalances of the past is widely accepted, there are others who argue that transformation policies are contributing to the shortage of engineering professionals in this country. To manage transformation responsibly is to have knowledgeable staff with the experience to ensure service delivery and the transfer of skills.

The current increase in numbers of those studying towards an engineering qualification at tertiary institutions is encouraging. In spite of this, the throughput rates to deliver engineering graduates are still poor. Factors such as the poor quality of the school system in general, and of mathematics and science education at school level specifically, are challenges in the light of the current engineering skills shortages.

Various stakeholders such as the ECSA, professional associations and large employers have proposed plans to address the engineering skills shortages in South Africa. Key among these, in terms of both scope and detail, is the work of Lawless (2005, 2007).

The establishment of Jipsa formalised the strategies to address the shortages of skills in general, but also specifically for engineering. Their focus is, inter alia, on developing and recruiting engineering and technical skills, and in the short term, developing a graduate employment strategy and recruiting retired specialist and expert mentors. Their interventions go as far as making significant monetary contributions to some universities to train more engineering professionals.

Lawless (2005) drafted a comprehensive list of interventions to address imbalances and blockages in the civil engineering profession over a longer period. These suggested interventions are applicable to all engineering professions. The recommendations arising from this work are presented below; these serve mainly to support rather than add to those of Lawless.

In the *general and further education phase,* the number of high-quality Grade 12 learners competent in mathematics and physical science can be increased, inter alia, by improving numeracy from Grade 1 through to Grade 12 with appropriate syllabi, high-quality teachers and upgraded infrastructure.

50 Japan faces engineering shortage, *The New York Times* 18 May 2008

51 The shortage of engineering teachers in India is much worse than observers in the United States are aware, Indian academics report, *EE Times* 17 December 2007

Co-ordinated nationwide career guidance initiatives at school level can create awareness of the engineering profession and opportunities.

In the *tertiary education and graduate training phase,* the throughput rate and the number of competent engineering graduates entering the labour market can be increased by, inter alia, disbursing higher subsidies to tertiary institutions for scarce skills such as engineering; developing a standardised model for selection of engineering students; providing sufficient bursary schemes; reviewing curricula to better align education and the needs of industry; improving staff-to-student ratios; encouraging companies to enlist more national diploma students on learnerships and provide them with the opportunity to do their one-year experiential training; investing in learnerships to ensure comprehensive workplace training; and establishing a framework for the transfer of knowledge from older engineering professionals to the younger cohorts.

In the *employment phase,* strategies can be applied to attract and retain engineering professionals by increasing remuneration; introducing a scarce skills allowance; establishing dual career paths (so that an engineering professional can have the same benefits and promotion opportunities working either as a manager or as a technical expert); creating flexible working arrangements, especially to attract more women; making immigration less cumbersome; recruiting retired engineering professionals; recruiting South African engineering professionals back from abroad; and placing a moratorium on employment equity requirements in relation to scarce skills.

References

Adams M (2006) Employability of South African engineering graduates. Talk given to Department of Chemical Engineering, University of Cape Town

Bernstein A, Simkins C & Rule S (2007) *Doubling for growth: Addressing the maths and science challenge in SA's schools.* Johannesburg: Centre for Development Enterprise

Berry A (2006) Employment and income distribution experiences of minerals exporters and of countries achieving growth acceleration. Unpublished paper, August, EGDI, HSRC, Pretoria

Bhorat H, Meyer J & Mlatsheni C (2002) *Skilled labour migration from developing countries: Study on South and Southern Africa.* International Migration Paper. Geneva: International Labour Organisation

Bot M (2006) Output from the schooling system: Focus on senior certificate examination results, 1996–2005. Unpublished paper commissioned by the HSRC for the Department of Labour

Carter R & Kirkup G (1990) *Women in engineering: A good place to be?* London: Macmillan

Coles BS (1994) Equal opportunities in engineering education. *Engineering Science and Educational Journal* October: 199–204

Department of Public Enterprises (2006) *Section four: The Accelerated and Shared Growth Initiative of South Africa (Asgisa)*. Pretoria: Department of Public Enterprises

DoE (Department of Education, South Africa) (1996–2005) Higher Education Management System (HEMIS) annual databases. Pretoria: DoE

DoE (2001) *National plan for higher education*. Pretoria: DoE

ECSA (Engineering Council of South Africa) (2008) Engineering Council of South Africa obtains interdict against Tshwane Metropolitan Municipality. Media Release from the Engineering Council of South Africa, 1 February

ECSA (Engineering Council of South Africa) & EASA (Engineering Association of South Africa) (1995) *Joint submission to the National Commission on Higher Education by the Engineering Council of South Africa and the Engineering Association of South Africa.* Johannesburg: ECSA & EASA

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

European Union Commission Report (2006) *EU research on Social Sciences and Humanities: Creating cultures of success for women engineers*. Brussels: European Commission

GCIS (Government Communication Information System) (2006) *Accelerated and Shared Growth Initiative for South Africa (Asgisa)*. Accessed 4 August 2006, http://www.info.gov.za/Asgisa/Asgisa.htm

Hanrahan H (2000) A nationally integrated model for qualifications, registration and licensing the engineering profession. Paper presented at the South African Conference on Engineering Education, 28–29 September, Vanderbijlpark, South Africa

Jawitz J & Case J (1998) Exploring the reasons South African students give for studying engineering. *International Journal of Engineering Education* 1(14): 235–240

Jipsa (Joint Initiative on Scarce Skills for South Africa) (2006) Increasing the yield of registered engineers and other construction professionals at tertiary institutions. Business Plan (second draft). Pretoria: The Presidency

Lawless A (2005) *Numbers & needs: Addressing imbalances in the civil engineering profession*. Halfway House, South Africa: South African Institution of Civil Engineering

Lawless A (2007) *Numbers & needs in local government*. Halfway House, South Africa: South African Institution of Civil Engineering

Maree GM, Pretorius A & Eiselen RJ (2003) Predicting success among first-year engineering students at the Rand Afrikaans University. *Psychological Reports* 93: 399–409

Pitt M (2002) Needed: Achievement and aptitude. *Issues in Science and Technology* 19: 15–17

Quantec (2007) *Easy data*. Pretoria: Quantec

Ramphele M (2008) Mzigisi a ka na shwa: Kodumela moepathutse ga go lehumo le letswang kgauswi. Speech delivered at the Masakh'iSizwe Centre of Excellence Bursary Awards Ceremony, Cape Town, 21 February

Reed B & Case JM (2003) Factors influencing learners' choice of mechanical engineering as a career. *African Journal of Research in SMT Education* 7: 73–83

SAACE (South African Association for Consulting Engineers) (2008) Home page. Accessed 3 July 2008, http://www.SAACE.co.za

Smith WS & Erb TO (1986) Effect of women science career role models on early adolescents' attitudes toward scientists and women in science. *Journal of Research Science Teaching* 23: 667–676

Steyn G & Daniels RC (2003) Engineers and technicians. In *Human resources development review 2003: Education, employment and skills in South Africa*. Cape Town: HSRC Press

Interviews

Interview (2006a) Formal interview with the Vice-President of the Engineering Council of South Africa, 24 May 2006, Pretoria

Interview (2006b) Formal interview with the Leadership and Professional Development Manager at Eskom, 30 August 2006, Johannesburg

Interview (2006c) Formal interview with the Vice-President of the South African Institution for Civil Engineering, 16 August 2006, Midrand

Interview (2006d) Formal interview with the CEO of the South African Association of Consulting Engineers, 8 August 2006, Johannesburg

Interview (2006e) Formal interview with the Dean of the Faculty of Engineering at the University of Johannesburg, 4 August, Johannesburg

Interview (2006f) Formal interview with the Dean of the Faculty of Engineering at the University of Cape Town, 21 August 2006, Cape Town

Interview (2006g) Formal interview with the Head of Department and Chair of the School of Engineering, University of Pretoria, 24 May 2006, Pretoria

Interview (2007) Formal interview with the Managing Director of Engineering Work Solutions, 17 August 2007, Johannesburg

CHAPTER 6

Doctors

Mignonne Breier

Any consideration of the medical profession in South Africa needs to take account of the fact that, in the global market for knowledge and the knowledgeable (what Halvorsen (2005) calls 'knowledge shopping'), health professionals are highly prized. This has led to an international migration carousel in which doctors and nurses offer their services – or are actively recruited – to countries that offer better conditions than their own. Of course there are some, particularly doctors, who go abroad to gain specialist training, and others who take temporary 'gap' years. And there are some professionals from rich nations who are driven by altruism to work in poor countries. But many come from poor nations and are lured abroad by better salaries or working conditions, or propelled by poor economic and political conditions in their home country. Some wealthy nations with increasingly aged populations are encouraging and often actively recruiting doctors and nurses from outside their borders because they have failed to train enough of their own to support their growing health needs. Professionals from less developed countries which have similar standards of medical training are particularly desirable. For the population back home, especially in Africa, the effects can be devastating. Although émigrés do send back remittances, those from sub-Saharan Africa are said to be the smallest of all 'poor world' 'back contributions' (Carballo & Mboup 2005: 12) and do not compensate for irreplaceable doctors and nurses and other health workers who are needed more than ever now because of the HIV/AIDS pandemic.

As a measure of the extent of the problem, it is worth quoting the most comprehensive attempt to quantify Africa's loss. Clemens and Pettersson (2008), using census data, have calculated that in 2000 there were 65 000 African-born doctors and 70 000 African-born professional nurses working overseas in nine 'developed' countries. This represents about one-fifth of African-born physicians in the world and about one-tenth of African-born professional nurses. The losses to individual countries ranged from 5 per cent of the total physician workforce in Egypt to 75 per cent in Mozambique, and of professional nurses from less than 1 per cent in Egypt to over 81 per cent in Liberia.

In South Africa, migration of medical doctors has both internal and external dimensions. Doctors are trained in public-service hospitals and serve one year's community service in rural or 'inhospitable' locations after qualifying, but few remain there. Most migrate to the private sector in urban areas. Many leave the country, some straight after graduating, others later. Ironically, the rural areas of Canada are among the popular destinations for South Africans. Here they endure the rigours of the backwoods in exchange for high salaries. Back home, the rural public service is dependent in many areas on foreign doctors, including Africans who are fleeing the working and political conditions in their home countries, and Cubans who come to the country in terms of government-to-government agreements.

Cuba over-produces doctors on a massive scale and exports their services in return for valuable foreign exchange and political kudos.

It is against this background that the profession of the medical practitioner in South Africa should be viewed, and these issues of supply and demand addressed: Do we have enough doctors? Where are they needed most and where are they working? What is the extent of emigration? Why are they leaving? What is the government doing to address shortages? What is the role of medical education? What more can be done?

Do we have enough doctors?

In 2006, a total of 33 220 medical practitioners were registered with the Health Professions Council of South Africa (HPCSA), and therefore able to practise in this country. This represented a 14 per cent increase since 1999 and an annual average growth of 1.9 per cent in the 7-year period. Note that the number of practising doctors is lower than the total number registered, because the register does not distinguish between doctors who are actually practising and those who are not. Therefore the total registered could include some who are retired, out of the country or just inactive.

Doctors per 10 000 population

Analysis of figures for registered doctors in relation to the general population and international standards indicates that South Africa is substantially better supplied with doctors than its immediate neighbours, but grossly under-supplied when compared with many developed countries. In the following analysis, statistics are provided for the year 2004, the most recent year that was common to a number of data sources.

Table 6.1 compares South Africa with several neighbouring countries, drawing on statistics from the World Health Organization (WHO). In relation to high- or even middle-income countries, as defined by the World Bank (see Sanders & Meeus 2002), South Africa ranks only slightly above those classified as low-income, as Table 6.2 shows.

When the figures are analysed further to show provincial breakdowns, the picture becomes more complicated.

Medical practitioners by province

In the Western Cape and Gauteng, there are 14.7 and 12.6 physicians per 10 000 people respectively, ranking with middle-income countries. In Limpopo, there are only 2.1 doctors per 10 000, placing this province only slightly above the average for sub-Saharan Africa. The inequity of provision in the Western Cape and Gauteng in relation to other provinces (Table 6.3) is compounded when one considers that most medical aid members are located in these two provinces, each of which has two medical schools with associated tertiary teaching hospitals.

The figures in Table 6.3 reflect the situation in both public and private sectors. Table 6.4 shows the situation in the public sector alone. It provides a sense of the shortage of doctors in the public service, particularly in the rural provinces such as the Eastern Cape, Limpopo and North West.

Although the Western Cape and Gauteng figures for public- and private-sector doctors combined (Table 6.3) are relatively high in relation to the rest of South Africa, even these provinces are not on a par with many developed nations. Table 6.5 presents figures for practising medical practitioners in

TABLE 6.1: *Medical practitioners per 10 000 population in South Africa and neighbouring countries, 2004*

Countries	Medical doctors
South Africa	7.7
Botswana	4.0
Kenya	1.4[a]
Lesotho	0.5[b]
Malawi	0.2
Mozambique	0.3
Namibia	3.0
Swaziland	1.6
Uganda	0.8
Zambia	1.2
Zimbabwe	1.6

Source: WHO 2006
Notes: a. 2002; b. 2003

TABLE 6.2: *Medical practitioners per 10 000 population in high-, middle- and low-income countries, 2001*

Income Type	Medical doctors
High-income countries	28
Middle-income countries	18
Low-income countries	5
Sub-Saharan Africa	1

Source: World Bank 2001 cited in Sanders & Meeus 2002

Organisation for Economic Co-operation and Development (OECD) countries (in other words, they exclude those on the register who are not actually working; therefore they are lower than they might be if they included all registered doctors).

Where are they needed most and where are they working?

Whether this workforce is large enough for the population's needs depends on two main factors: where they are needed most and where they are working.

From numerous sources (Council of Medical Schemes 2006; Health Systems Trust 2004, 2005; Statistics South Africa (Stats SA) 2007), we know that 85 per cent of the population do not have medical aid and are reliant on the public service. However, only about 41 per cent of our medical doctors are working in this sector. Conversely, 15 per cent of the population do have medical aid and utilise the private sector, where approximately 59 per cent of our medical doctors are working. Of course, these figures

TABLE 6.3: *Number of medical practitioners per 10 000 population, in South Africa by province, 2004*

Province	Medical doctors	Province	Medical doctors
Western Cape	14.7	Mpumulanga	3.0
Gauteng	12.6	Eastern Cape	2.7
Free State	5.4	North West	2.3
KwaZulu-Natal	5.2	Limpopo	1.8
Northern Cape	4.2	National average	6.7

Source: Calculations based on HPCSA statistics on registered medical practitioners as at 8 November 2004 supplied to the author, and Stats SA 2004

TABLE 6.4: *Medical practitioners per 10 000 uninsured population, 2000–2007*[a]

Year	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
2000	1.23	2.43	3.66	2.40	1.25	1.64	2.89	1.19	3.97	2.19
2001	1.22	2.22	2.87	2.23	1.22	1.64	2.63	1.22	3.25	1.98
2002	1.13	2.34	2.91	2.24	0.91	1.66	2.42	1.18	3.31	1.93
2003	1.27	2.31	2.54	2.13	1.43	1.79	2.84	1.15	3.19	1.97
2005	1.58	2.07	2.59	2.42	1.43	2.15	3.65	1.36	3.61	2.19
2006	1.61	2.14	2.97	2.75	1.48	2.20	3.47	1.48	3.88	2.37
2007	1.70	2.28	2.95	3.01	1.74	2.09	4.12	1.49	3.38	2.24

Source: PERSAL, in Health Systems Trust 2004

Notes: a. 2004 figures not available

b. EC = Eastern Cape; FS = Free State; GP = Gauteng Province; KZN = KwaZulu-Natal; LP = Limpopo; MP = Mpumalanga; NC = Northern Cape; NW = North West; WC = Western Cape; SA = South Africa

are complicated by the fact that some private doctors do sessions in the public service and vice versa, and some private patients do make use of public facilities, but the 15 : 59 and 85 : 41 ratios present the broad picture for 2006/07. The inequality of distribution of the medical workforce appears even greater when one compares our figures with those of developed nations and considers the distribution of doctors by province.

Vacancies

The Health Systems Trust (2007) reports 5 103 public-sector vacancies for medical practitioners in 2006, based on the government's Personnel and Salary Information System (PERSAL) data. A study of advertised vacancies by the Human Sciences Research Council (HSRC) (Erasmus 2008) also emphasises the shortage of medical practitioners in the public sector. The study analysed the Department of Labour's (DoL) database of 112 828 vacancies advertised in the *Sunday Times Business Times* between April 2004 and March 2007 and found that half these vacancies were for professionals, and nearly one-third of the professional vacancies were for health professionals (a total of 17 479 vacancies). Of these, the largest category was for midwives and professional nurses (44 per cent), followed by medical practitioners (36 per cent), of which 95 per cent were in the public sector. The HSRC study found a

TABLE 6.5: *Number of practising medical practitioners per 10 000 population, OECD countries, 2004*

Country	Medical practitioners	Country	Medical practitioners
Australia	27	Korea	16
Austria	35	Luxembourg	24
Belgium	40	Mexico	17
Canada	21	Netherlands	36
Czech Republic	35	New Zealand	22
Denmark	36	Norway	35
Finland	24	Poland	23
France	34	Portugal	33
Germany	34	Slovak Republic	31
Greece	49	Spain	34
Hungary	33	Sweden	34
Iceland	36	Switzerland	38
Ireland	28	Turkey	15
Italy	42	UK	23
Japan	20	USA	24

Source: OECD 2007

fill rate of 57 per cent for health professionals in general, and 54 per cent for medical practitioners. In international terms, fill rates of less than 80 per cent are regarded as signs of shortage (New Zealand Department of Labour 2005).

Of the advertisements for medical practitioners across the 3 years, most were for 'generalist medical practitioners' (51 per cent), followed by internal medicine specialists (20 per cent), 'miscellaneous' medical practitioners (9 per cent) and surgeons (3 per cent).

The human resources implications of HIV/AIDS

In 2005, the national Department of Health (DoH) estimated that 5.5 million South Africans were living with HIV, an estimated prevalence of 10.8 per cent. An HSRC study found prevalence across all age groups was 13.3 per cent for women and 8.2 per cent for men (Shisana et al. 2005). Tuberculosis (TB) is the most important opportunistic infection associated with HIV and South Africa has the fifth-highest number of notified TB cases in the world (Grimwood et al. 2006).

The Operational Plan for Comprehensive HIV/AIDS Care, Management and Treatment (DoH 2003) noted that the roll-out of anti-retrovirals (ARVs) would require a substantial increase in health human resources. It estimated that a total of 21 824 new staff would have to be recruited between March 2004 and March 2008. Of these, 975 would need to be doctors and 6 822 nurses.

The DoH has subsequently produced a National Human Resources for Health Planning Framework (hereafter called the NHR Plan) that makes no mention of the human resources required to deal with the HIV/AIDS pandemic (DoH 2006a).

What is the extent of emigration?

It is difficult to quantify the extent of emigration because of under-reporting. The official figures are based on the information provided by individuals when they leave or enter the country. It is widely recognised that these data are largely incomplete and inaccurate, and represent a severe under-count of emigration from South Africa. The completion of forms on departure is not always enforced and not all individuals intending to emigrate indicate this. Only individuals leaving from the major South African airports are captured. South Africans who leave to travel and then stay abroad permanently are not captured. The system only recently started capturing disaggregated occupation data, and Stats SA categories have changed over the years, making it difficult to formulate trend analyses (Meyer, Brown & Kaplan 2000, cited in Wilson et al. 2004: 28).

Nonetheless, there is some merit in producing tables such as those in this section, because they do give a sense of trends over time. For example, in the period 1989–1994 we experienced a gain in physicians according to the figures in Table 6.6, peaking at 296 in 1992. However, by 2002, we had begun to experience a net loss. This started at a loss of 33 doctors in 1996 and increased to a loss of 156 doctors

TABLE 6.6: *Migration trends (N), doctors, 1988–2003*

Year	Immigration	Emigration	Net gain/loss
1988	68	73	−5
1989	69	36	33
1990	135	30	105
1991	229	23	206
1992	327	31	296
1993	248	37	217
1994	163	93	70
1995	74	71	3
1996	70	103	−33
1997	40	82	−42
1998	28	105	−77
1999	39	83	−44
2000	22	105	−83
2001	17	94	−77
2002	67	128	−61
2003	54	210	−156

Sources: Hall & Erasmus 2003 (1988–1998); Stats SA 2003

in 2003. The trend could be a reflection of political and socio-economic conditions in the country – the surge of confidence as the country entered democracy and subsequently growing disillusionment due to a number of factors which were identified in studies by the OECD (2004), ranging from increased use of public health services and HIV/AIDS to crime and affirmative action.

It is important to note that these figures do not include previous waves of emigration under apartheid, particularly in the mid-1970s and 1980s.

Other international sources of data, which encompass earlier emigrations, suggest a far more serious problem than the Stats SA figures present. Table 6.7 lists the major sources of statistics on South African doctors abroad, mainly in OECD countries. Although the reports from which these statistics emanate also give figures for other African countries, Table 6.7 concentrates on South Africans.

Several authors have tried to calculate the percentage of the total workforce of African countries that are abroad, but the calculations are inconsistent. The most reliable calculations are probably those of Clemens and Pettersson (2008) who use census data on African-born doctors who are actually working abroad and at home. Their data suggests that about one quarter of all South African-born doctors were working in seven other countries around 2001.

This chapter concentrates on medical doctors, but the emigration of other health professionals, particularly nurses, is also of great concern. The interdependence of the two professions means that a shortage of nurses has serious consequences for medical doctors, and vice versa. Clemens and Pettersson (2008) estimate that there were 4 844 South African nurses living in the 8 receiving countries surveyed. When added to the number at home at the time (90 986), this figure represents 5 per cent of the total South African-born nursing workforce.

Why are they leaving?

In its references to the OECD (2004) study, the NHR Plan (DoH 2006a) cites that part of the report which states that pay was not the prime motive for health professionals leaving the country. According to the report, they also left because of deteriorating work conditions, increase in workload due to wider access to health care, uneven distribution of resources between private and public sectors and between urban and rural contexts, exposure to AIDS and other endemic infectious diseases like TB, insecurity resulting from delinquency, the lack of suitable equipment, and social and racial factors.

However, elsewhere in the OECD report, another set of reasons is given in which politically contentious issues such as crime and affirmative action feature strongly. This list also placed higher rates of pay low on the list. These other factors were:

- insecurity and crime;
- affirmative action;
- deteriorating public education;
- uncertainties about the future, especially for children;
- perceived fragility of the South African economy;
- the transferability of South African qualifications in OECD member countries;
- integration into a knowledge-based global economy with sharply increased competition for skills;
- foreign recruitment;
- higher rates of pay abroad;
- deteriorating conditions in the public sector.

TABLE 6.7: *Estimates of South African doctors abroad*

Source	Date of publication	Estimated number of doctors abroad	Recipient countries		Applicable year	Data sources
OECD[a]	2004	8 921 SA-born 'practitioners' practising a 'medical' profession, including doctors, dentists, veterinarians, pharmacists and other diagnostic practitioners	Australia Canada New Zealand UK USA	1 114 1 345 555 3 625 2 282	2001	Employment surveys, population surveys and census data
Hagopian, Thompson, Fordyce, Johnson & Hart[b]	2004	3 788 registered doctors who had received training in SA	Canada USA	1 943 1 845	2002	American and Canadian Medical Associations
Clemens & Pettersson[c]	2008	8 197 SA-born doctors working as health professionals in 7 countries	Australia Canada France Portugal Spain UK USA	1 111 1 545 16 61 5 3 509 1 950	2001 2001 1999 2001 2001 2001 2000	Census data
WHO[d]	2006	12 136	Australia, Canada, Finland, France, Germany, Portugal, UK, USA	No breakdown by country	Not stated	Not stated

Notes: a. These OECD figures (OECD 2004), although imprecise, are often quoted in South Africa and are the only migration figures in the DoH's NHR Plan.

b. Hagopian et al. (2004) provide data for 21 sub-Saharan African countries. South Africa had the highest number overall due to its sizeable numbers in Canada, but in the USA, there were more Nigerians than South Africans (2 158 compared with 1 943). This study also found that only 10 medical schools produced 79.4 per cent of the sub-continent's graduates who are practising in the USA. The University of the Witwatersrand was top of the list (1 053 doctors), followed by the University of Cape Town (655). The University of Pretoria was 10th on the list with 132 doctors in the USA.

c. Clemens and Pettersson (2008) provide data for 53 African countries and 9 receiving countries and show a total of 64 491 African-born physicians in the 9 countries. They also include South Africa as a receiving country and show that there were 834 doctors born elsewhere in Africa who were working in South Africa in 2001.

d. WHO (2006: 100) lists 11 African countries, of which South Africa has the highest numbers of doctors abroad. Nigeria, the next-highest, had about one-third South Africa's total (4 621).

The report noted, however, that for some medical professionals, mobility was a temporary phenomenon and that they did eventually return to South Africa.

It is probably no consolation that South Africa is not the only country to experience this problem. The migration of health professionals is a worldwide phenomenon and other developing countries, including several African countries, are also losing doctors and nurses in this way. The reasons for emigration are not clear. A study by Awases, Gbary, Nyoni and Chatora (2003), cited in Lehmann and Sanders (2004), says social conflict and unrest are major reasons for emigrating from African countries and rank above financial incentives and poor working conditions. However, the *World Health Report* (WHO 2006) cites a report from sub-Saharan Africa that found other reasons for migration from four African countries (Cameroon, South Africa, Uganda and Zimbabwe). The main reason was better remuneration, followed by (in descending order of importance) safer environment, living conditions, lack of facilities, lack of promotion, no future, heavy workload, to save money, work tempo, declining health service, economic decline, poor management and to upgrade qualifications.

It should be noted that while South Africa is losing health professionals, it has over the years also benefited from the services of foreign doctors, some of whom were recruited by the DoH to work in under-serviced areas. However, their numbers have dwindled and are due to decline further as a consequence of recent policies designed to prevent the inflow of doctors from other African countries.

Foreign doctors

At the most conservative estimate, approximately 9.4 per cent (3 128) of registrations with the HPCSA in 2006 were of foreign doctors (identified by their postal addresses). If one considers the numbers of foreign qualifications registered, then the figure rises to 13.6 per cent (or 4 536).Unfortunately, the HPCSA is not able to provide more definitive figures, so it is difficult to compare these figures with previous estimates of up to 22 per cent (see Sanders & Lloyd 2005). Nonetheless, there does seem to have been a substantial decrease in the numbers of foreign doctors, which is not surprising given the DoH's increasingly restrictive policies on the employment of foreigners.

In 2006, the DoH introduced a policy limiting the employment of foreign health professionals to three-year contracts which are non-renewable. The NHR Plan proposes further that the total foreign workforce should not at any stage exceed 5 per cent of the total health workforce in each professional category, taken on a broad basis. This means that the department wishes to restrict the number of foreign doctors to no more than 5 per cent of the total number of medical practitioners. This, in turn, means reducing the number of foreign doctors by between one-half (1 467 doctors) and two-thirds (2 875 doctors) to a total of about 1 661 (using 2006 figures). Given that most of these doctors work in the public service and many in rural areas, the effect on the rural public health service will be devastating. Against the total of 9 527 doctors in the public service in 2006, a cut of 1 467 represents a loss of 15 per cent, and 2 875 a loss of 30 per cent.

The policy outlined above is designed to prevent an influx of doctors from elsewhere in Africa and is the result of a commitment to the governments of other African countries, particularly the Southern African Development Community (SADC) region. It bans active recruitment directed at other developing countries in Africa and favours recruitment from other countries by government-to-government agreement. Foreign doctors who are not permanent residents may not work in the private sector.

Whether the policy is a good idea or not is debatable. Firstly, the policy has the effect of keeping out doctors from developed countries who wish to come to South Africa for a variety of reasons (including altruistic reasons and a desire to gain clinical experience).

Secondly, there is evidence (e.g. from Hagopian et al. 2004, and Clemens & Pettersson 2008) that sizeable numbers of African doctors emigrate to other overseas countries including the UK and USA, which means they are likely to leave the continent if they are not allowed into South Africa. In many cases, they leave because the situations in their countries are intolerable, for political or economic reasons, or both.[1]

South Africa is in a Catch-22 situation. If we allow doctors from neighbouring countries into our country, we will be helping to deplete their home countries' meagre medical resources and we will antagonise their governments. However, if these doctors leave the continent the chances are they will also lose touch with their African roots, with consequences for future generations. If they do not practise as doctors and lose their skills, then the education which they received at Africa's expense will be wasted entirely. This is less likely if they stay in South Africa. By contributing to South Africa's health system they will also contribute, albeit indirectly, to South Africa's ability to support the rest of the continent in other respects. These are the problems for which there seems to be no ideal solution.

The government is not entirely averse to foreign doctors, however, and the importation of doctors on the basis of government-to-government agreements is one of its strategies for dealing with the rural shortages of medical practitioners.

The Cuban doctors

With 65 000 doctors for a population of around 11 million, Cuba has the highest doctor-to-population rate in the world (about 59 to 10 000 compared with South Africa's 6.7) and has sent thousands of doctors and other professionals to more than 40 countries around the world to assist in their healthcare programmes.

Professor JA Aguirre, head of the Cuban medical doctors at Walter Sisulu University (WSU), said in an interview with the author that the first group of 92 Cuban doctors arrived in February 1996, at the request of President Nelson Mandela, who brokered the government-to-government agreement for South Africa. A further request by President Mandela led to the arrival of 11 Cuban medical academics in February 1997, with Professor Aguirre as their leader. In the years that followed, the number of doctors on the government-to-government programme swelled at one point to over 400 and the number of medical lecturers to about 35, but numbers are now dwindling. At the time of the interview (June 2005), there were only 168 doctors and 26 lecturers on the programme. When asked why this was so, Professor Aguirre explained that some of the doctors had decided to return to Cuba and had not been replaced. Furthermore, the Cuban government had begun supporting countries which it perceived as having a greater need than South Africa, particularly countries in South America but also other countries in Africa, including Lesotho, Zimbabwe, Namibia, Botswana, Mali and Nigeria. There are currently around 20 000 Cuban doctors in Venezuela alone.

However, if numerous media reports are anything to go by, it is likely that the Cuban government is displeased by the number of Cuban doctors who have opted out of the programme to stay in South Africa, some after marrying local women, and feels that Cuba's political and economic interests are better served by sending doctors elsewhere.

Doctors who come to South Africa as part of this agreement have gone through a strict selection process, first by the Cuban Department of Health and then by expert representatives of the HPCSA.

1 Individuals who have acquired refugee status are permitted to apply to the HPCSA for registration, and if this is granted, they are permitted to work here, provided they do so in a public-service, under-resourced institution.

As part of the deal, they get immediate registration with the HPCSA without having to go through the usual examination procedures for foreign doctors, and an immediate work permit. They are paid the same rates as local doctors, while their normal salary continues to be paid into their personal accounts in Cuba. Although they have to send a large portion of their South African salaries back to Cuba (30 per cent to the Cuban government and 27 per cent to a personal account), they still find it financially advantageous to work in this country, as doctors in Cuba are paid very low salaries (OECD 2004). A condition of employment is that they will vacate their post if a South African applies for it. If they decide to stay in South Africa, they have to leave the programme, return to Cuba and apply from there to work here, following the rules that apply to all other foreign doctors.

Cuba has also assisted South Africa by offering 60 scholarships per year to South Africans to study medicine in Cuba, and there are currently about 300 medical students who are being trained or were trained in this way (Aguirre interview). They study one year of Spanish and then five years of medicine before returning to South Africa to do their final clinical rotations and community service. They are required to remain in the public service for five years after completion of their studies and they are deployed by their respective provinces to hospitals where their services are needed most. By July 2007, a total of 470 South Africans had been enrolled in this programme, of whom 91 had qualified as doctors (DoH 2006b).

The South African government has also brought in 16 doctors from Iran and is currently negotiating for approximately 1 000 doctors from Tunisia.[2]

What is government doing to address shortages?

The government-to-government importation of doctors from Cuba and elsewhere on a temporary basis is one of the measures which government has implemented to address the shortage of doctors, particularly in the rural areas.

Other measures include a scarce-skill allowance, a rural allowance, community service, and specific legislation designed to boost other forms of health care and to control the geographical distribution of newly registered doctors.

Allowances

The first and most significant measure, for the purposes of this report, is the scarce-skills allowance which was introduced in 2004 (DoH 2004). The introduction of this 15 per cent allowance for medical doctors and medical specialists, among other categories of health professionals, is important because it recognises, quite clearly, that there is a shortage of doctors (and other health professionals) and tries to compensate accordingly. Indeed it states quite specifically: 'The allowance shall be payable to the occupational groups that are designated as Scarce Skills' (DoH 2004: 3). It is surprising, in this context, that doctors are not listed in the DoL's master list of scarce skills. A former chairman of the Immigration Advisory Board of South Africa, Dr Wilmot James, and the secretary of the board, Lyndith Waller, have also argued strongly for the inclusion of doctors on this list.[3]

A further allowance of between 18 per cent and 22 per cent was also introduced in 2004 for doctors and specialists (and other selected health professionals) who work in rural and other 'inhospitable' areas within the public service.

2 Ntuane L, North West welcomes 16 Iranian doctors, *BuaNews Online* 20 August 2006, www.buanews.gov.za; Warby V, Govt on recruitment drive for health professionals, *BuaNews* 4 July 2007, www.buanews.gov.za

3 James W & Waller L, Faltering start in luring skills, *Cape Times* 18 April 2006

Community service

Since 1998, newly graduated medical practitioners, pharmacists and dentists who have completed their internship have been required to undertake a year's paid community service, which is now popularly known in the profession as 'comserve'. Nurses are also required to do so since 2008. The system was put in place as a measure to alleviate staff shortages in rural and under-served areas. Whether it encourages young doctors to remain in such areas after completion of community service is a moot point (see Reid 2002). This is in addition to attrition after graduation and before the comserve year. Analysis in Breier (2007) shows that there were substantially smaller numbers of comserve doctors in 2002 and 2003 than graduates in 2000 and 2001. These graduates should have completed internship in 2001 and 2002 and entered comserve the following year. For each of these cohorts, there were 11 per cent fewer comserve doctors than might have been expected. For the next three cohorts, the fall-off between graduation and comserve ranged between 5 and 7 per cent. However, in 2007, the numbers decreased dramatically, with 19 per cent fewer comserve doctors than graduates in 2005. (This represents a dropout of 287 out of 1 511 graduates.)

The comserve situation has highlighted once again the importance of foreign doctors in propping up South Africa's rural and public service. The DoH is calling in foreign doctors from Tunisia, Poland and Russia to fill the 2008 gap, as well as asking private doctors to do sessions in the public service and community service doctors to stay on at their postings.[4]

Legislation

Among the many acts and regulations emanating from the DoH since 1994 are a number designed specifically to correct the imbalance between rural/urban public/private provision:

- The Pharmacy Amendment Act (No. 88 of 1997) extended ownership of pharmacies to people other than pharmacists to ensure adequate distribution in rural and under-served areas.
- The National Health Act (No. 61 of 2003), promulgated in 2004, specified that private practitioners must obtain a 'certificate of need' to practise in a particular area. Before such a certificate is issued or renewed the Director General of Health must consider a number of factors, including 'the need to promote an equitable distribution and rationalisation of health services and health care resources' and 'an appropriate mix of public and private health services' (DoH 2003: 44).
- The Traditional Health Practitioners' Act (No. 35 of 2004), promulgated in 2005, provides for the establishment of an Interim Traditional Health Practitioners Council and for the registration, training and practices of traditional health practitioners, with the aim of serving and protecting the interests of those who use these services. It has been estimated that there are 200 000 traditional healers practising in South Africa and that they are consulted by 80 per cent of the population, before or instead of consulting biomedical practitioners (Padarath et al. 2003).

What is the role of medical education?

The DoH, in its NHR Plan (DoH 2006a), says 'significant shortages and extreme mobility of medical doctors necessitate that production is increased' and proposes that production of medical doctors should increase from approximately 1 200 per year [sic] to 2 400 per year by 2014. In other words, the department was hoping in 2006 to double the number of graduates in eight years. A further warning that South Africa is not producing enough medical doctors has come from Dr Kgosi Letlape, chairman of the South African Medical Association (SAMA). He attributes the problem to our shortage of

4 Bateman C, Rural health care time-bomb as doctors shortage looms, *Cape Times* 20 December 2006; Ntuane L, North West welcomes 16 Iranian doctors, *BuaNews Online* 20 August 2006, www.buanews.gov.za; Warby V, Govt on recruitment drive for health professionals, *BuaNews Online* 4 July 2007, www.buanews.gov.za

medical schools and says that the USA has 1 medical school per 2 million population, against our 1 per 6 million.[5] Private medical schools have been proposed.

This section of the chapter considers the feasibility of a sharp increase in production of medical graduates by analysing graduation trends at the eight medical schools for the years 1999 to 2005, based on available data from the Department of Education's (DoE) Higher Education Management Information System (HEMIS) (DoE 1999–2005).

Graduations

Graduation numbers increased by 26 per cent, from 1 195 in 1999 to 1 511 in 2005. The average annual growth rate was 4 per cent. Graduation figures dropped at the University of Cape Town (UCT) (–18 per cent), the University of the Free State (UFS) (–4 per cent), University of Limpopo (UL) (–4 per cent) and stayed the same at the University of Pretoria (UP). The University of the Witwatersand (Wits) saw an increase in graduates of 14 per cent and the University of Stellenbosch (US), 3 per cent. The highest increases were at the historically (and currently still) black institutions. The University of KwaZulu-Natal (UKZN) increased its output by 161 per cent and Walter Sisulu University (WSU) by 82 per cent (albeit from a low base – from 38 graduates in 1999 to 69 graduates in 2005).

In 1999, male graduates outnumbered female graduates (53 per cent compared with 47 per cent) but by 2005 female graduates were in the majority, forming 56 per cent of graduates that year compared with males at 44 per cent. The highest proportion of female graduates was at UCT (68 per cent in 2005).

Although the profile of medical school graduates is considerably closer than before to the demographic profile of the country at large, Africans continue to be under-represented. The proportion of African graduates grew from 27 per cent in 1999 to 40 per cent in 2005, of coloured graduates from 5 per cent to 6 per cent and of Indian graduates from 16 per cent to 20 per cent. The proportion of white graduates declined from 52 per cent to 34 per cent. (Nationally, Africans form 79 per cent of the population, coloureds 9 per cent, Indians 3 per cent and whites 9 per cent.)

In considering the rate of change in the profile of medical graduations, one also needs to consider the profile of matriculants who achieve the higher-grade (HG) mathematics and science passes that are necessary to enter most medical schools. In 2006, Africans formed 83 per cent of those who wrote the Senior Certificate examination, but only 59 per cent of those who passed with endorsement. In 2005, Africans formed 59 per cent of those who wrote HG mathematics, but only 38 per cent of those who passed. They formed 69 per cent of those who wrote HG science, but only 45 per cent of those who passed. No doubt the immense language barrier faced by most African students contributes to a great extent to these results, for most have to study in a language that is not their home language.

Furthermore, the majority of schools continue to bear the imprint of apartheid, as a recent DoE report has indicated (Christie et al. 2007). This report on 'Schools that Work' shows that learners from poor schools that were created in terms of one or other of the machinations of apartheid for Africans, as well as new schools created by the current DoE primarily for Africans, continue to under-perform in relation to schools with different apartheid histories.

5 Sookha B, SA has too few medical schools, *Pretoria News* 1 February 2007

The authors suggest that these trends are not only reminders of the differential resourcing of schools under apartheid, when African schools were most poorly funded, but also suggest that the organisational patterns and cultures which prevailed in the past are continuing to do so.

Will the DoH meet its target?

The target of 2 400 doctors by 2014 is unrealistic. Firstly, if the current growth rate of 4 per cent continues unchanged, this total of doctors will only be reached in 2018. Secondly, there is the serious question of infrastructure and human resources to be considered.

The institution with the fastest-growing student numbers is WSU, which increased its enrolments from 310 to 476 between 1999 and 2005 and achieved an 82 per cent increase in graduates over this period, from 38 to 69. This medical school relies almost entirely on foreign doctors to teach its students, as shown in Breier and Wildschut (2006). However, the DoH is also planning to cut back on foreign doctors, as discussed earlier in this chapter.

The pressure on medical schools to change their student profiles, when the school system continues to produce insufficient Africans with the appropriate passes, complicates attempts to meet graduation targets. Some medical schools have introduced differential entrance criteria and academic support programmes to admit African and coloured students who do not meet the normal criteria, but these students generally do not graduate in the minimum time, so the rate of change remains below policy expectations.

The DoH's NHR Plan proposes 'an affirmative action approach to address capacity in rural areas' (DoH 2006a). It recommends that recruitment criteria for health science students should be revisited to earmark students from rural and under-serviced areas. Students from such areas should be offered state bursaries and there should be intervention at school level ('targeted preparation of students to enrol in health sciences').

Specialists

The DoH's national plan also expresses concern about the numbers of black and female graduates who opt for specialist training. A target is to increase the number of women enrolling for specialist training by 10 per cent by 2008. Another is to develop, by January 2007, a programme to promote entry of aspirant young black graduates to academia (DoH 2006a).

In this respect, the department's concern is echoed in HSRC research. A case study of specialist training at UCT Medical School found that proportions of women students were far lower at postgraduate level than at undergraduate level, although their numbers were increasing quite rapidly, thanks to a concerted transformation programme (Breier & Wildschut 2006). Furthermore, women were concentrated in certain disciplines such as psychiatry and paediatrics, while others, surgery in particular, were attracting very few women at all.

Will the 'new' medical graduates overcome the shortage?

An important question is whether the new, feminised and more racially representative medical graduates are likely to minimise the shortage of medical doctors. This raises other questions: are they more likely to enter the profession, stay in this country, work in the public sector, work in rural areas, etc.?

On the gender front, the increase in female medical graduates is very far from being reflected in the profession as a whole, which is still dominated by men who form nearly three-quarters of registered

practitioners. Women's numbers are increasing, but far more slowly than the increase in medical student enrolments would seem to indicate. Similar trends have been noted in the UK and USA. Indeed, the rate of change in the medical profession itself is such that it will take more than two decades for female doctors to outnumber male doctors.

The pressure to transform the medical schools racially and to target not only black students, but those black students from disadvantaged or rural backgrounds, is not only a question of equity but also based on the premise that students from such backgrounds will be willing to go back to their communities to work. The indications are that this is not necessarily so. Professor Ralph Kirsch, formerly professor of medicine at UCT, has been quoted as saying that the assumption, made in the late 1980s and 1990s, that changing the racial and gender profile of students from white male to mostly black and female would mean that students would be less inclined to migrate, has 'turned out to be false': 'Poor students have been just as inclined to migrate, perhaps even more so, given the large debts they have to pay' (*Financial Mail* 2007).

Existing research on medical students from disadvantaged backgrounds does not provide a clear picture of their career choices. There have been studies that indicate that rural students are more likely to return to rural areas (De Vries & Reid 2003). On the other hand, research from WSU Medical School presents a more complex scenario (Breier & Wildschut 2006). Most of their students are black (75 per cent African, 22 per cent Indian, 2 per cent coloured and less than one per cent white in 2003) and many come from the rural Eastern Cape. The curriculum is entirely problem- and community-based. If any medical school should be producing doctors who are prepared (in all senses of the word) to work in rural areas, it is WSU. But this is not necessarily so.

Dambisya (2003) surveyed 415 students at WSU Medical School in 2002. Out of 347 students who stated their preferred sector of work, 82 per cent chose public hospitals. Out of 376 students who stated place of work preferences, only 7 per cent wanted to work abroad, but 50 per cent wanted to work in urban areas and only 27 per cent in rural areas. Fifteen per cent had no preference. Women were even less inclined to work in rural areas than men. Dambisya also found that interest in rural and community work declines as the students progress through their training. Because most of the students at WSU are black, he concluded that his study supports the view that black students are more likely to stay in South Africa than their white counterparts.

Igumbor and Kwizera (2005) reported that 36 per cent of graduates from WSU Medical School since 1985 were practising in smaller towns and rural settings, while 53 per cent were working in urban areas. Four per cent were overseas (mainly in Canada and New Zealand but also in Australia, India and the USA) and 7 per cent had died (a startlingly high figure, given that even the earliest entrants would have only been around 39 years old today). Their research finds in favour of the problem- and community-based curriculum which was introduced in the early 1990s, showing that a greater percentage of graduates from the new curriculum were in rural areas than graduates from the traditional curriculum (66 per cent as opposed to 41 per cent).

Conclusion

There can be little doubt that there is a shortage of medical doctors in South Africa, concentrated mainly in the public and rural service. Nowhere in the country do we achieve the doctors-per-population norms of even middle-income countries internationally. We might compare favourably with our African neighbours but they are the most under-served countries in the world. In World Bank terms, we are, overall, only slightly better than countries defined as 'low-income'. At the same time, many thousands of our doctors – estimates range from one-fifth to one-third of our medical workforce – are working

abroad, in countries classified as high-income, with physician-to-population ratios that are many times more favourable than ours.

Much hope is being pinned on the educational system to alleviate the shortage of doctors by producing more graduates who are likely to stay in the country and work where needed most. There is a presumption that graduates who are black and/or come from rural or disadvantaged communities will be willing to return to those communities to work, but research is unclear as to whether this will be the case or not, with some studies confirming and others negating this premise. Another major flaw in the expectation is that the medical school which was actually designed to produce rural, African doctors (at WSU) is dependent on foreign doctors to fill its academic posts – at a time when the government has resolved to reduce the numbers of foreign doctors!

The majority of graduates now produced by medical schools are female, but the rate of gender change in professional registrations and postgraduate enrolments is slower than expected. Medical schools and the profession itself need to take account of the warnings that date back nearly three decades that the profession needs to make it easier for women to work and specialise. There need to be conditions of service that will allow women (and men) to work as doctors and train to be specialists without compromising their families. These include more part-time posts, normal working hours, locums for maternity leave and changed attitudes towards women, especially in the surgical disciplines (Breier & Wildschut 2006; Hudson et al. 1997; Saxe & Van Niekerk 1979).

Any consideration of the shortage of medical practitioners in South Africa needs to view the profession in terms of its global currency. A medical practitioner trained in South Africa who is competent in English is highly marketable in many overseas countries. This means that medical doctors are less likely than some other professionals (lawyers, for example) to tolerate unfavourable economic and political conditions within the country at large and their field of work in particular, because they have other, international options. At the same time, South Africa is an attractive destination for doctors from other African countries with economies and political systems that are far less stable than our own. But ethically and strategically (in terms of the politics of the African continent), it would be inappropriate for South Africa to encourage African doctors to come to this country when it is complaining about the loss of its own doctors to developed countries. For this reason, the government's policy of banning recruitment of doctors from other African doctors from permanent employment is understandable. However, the other provisions – to limit foreigners' contracts to non-renewable three-year contracts and to limit the total number of foreign doctors to no more than five per cent of the medical workforce – are misguided. The policy is unlikely to stem the exodus of African doctors, who will go elsewhere in the world if they can't come to South Africa. It avoids the undeniable fact that foreign doctors are propping up the rural services and it also has the effect of deterring doctors from developed countries who want to come to South Africa, whether to gain clinical experience, 'make a difference' or enjoy our sunshine. This policy needs to be amended urgently to distinguish between countries that have more than enough doctors for their own needs and those that do not. Doctors from the former category of countries should be welcomed. This category of doctors should also be included in the DoL's scarce skills list for immigration purposes. Government-to-government agreements, which are already favoured but have so far produced very small numbers, should continue to be pursued.

While there is widespread international recognition that migration of health professionals from developing countries is a global concern, opinions on possible measures to deal with this problem are greatly divided. It is generally accepted that the barring of professionals from leaving their countries to find employment elsewhere is inappropriate. This would be against human rights principles, 'would run counter to the globalising tendency of the labour market and would in any case be very difficult to put into practice' (GCIM 2005: 25). Migrants would also be discouraged from going back to their

own country if they left it without authorisation and felt that they would be penalised on their return (GCIM 2005).

Whether states that recruit foreign professionals should provide direct financial compensation to their countries of origin has been widely debated. The WHO supports this position but the Global Commission on International Migration (GCIM) (2005) says it is not practicable to do this. Amongst the reasons given for this view is that since the professionals work in more than one country, there is some debate as to where compensation would be paid, and there is no guarantee that compensation payments would necessarily be reinvested in training and retaining strategies. Both of the GCIM arguments can be contested. Firstly, as Dovlo (2004: 15) has noted, most of the health professionals emigrating from sub-Saharan Africa, at least, go to a few recipient countries, mainly the UK and USA. South Africans also go to Canada and New Zealand. Dovlo says this should make it relatively uncomplicated to establish inter-country arrangements to manage migration. Secondly, many donor countries specify conditions for the use of financial aid. Why can't their example be repeated here?

The GCIM suggests instead that foreign aid and investment should be 'more carefully directed towards countries and sectors that have been particularly affected by the loss of their professionals'. There should be 'co-operative relationships between labour-rich and labour-poor countries' to promote co-investment in the 'process of human capital formation and the development of a mobile and global pool of professionals' (GCIM 2005: 25). Again, the argument is flawed. The international pool generated by financial aid from developed countries might well be useful to the developed world but what proportion will be prepared to return to their countries of origin? The GCIM position here might well be seen as little more than a measure to protect the interests of developed countries and ensure that their supply of additional professionals is trained to global standards.

Developed recipient countries need to reduce their dependency on migrant health workers and train more of their own health workers to address the needs of their increasingly aged populations. The WHO says that the USA, for example, has trained 30 per cent too few physicians to fill its own needs. Dovlo (2004: 10) estimated that the USA's 130 000 foreign medical graduates at the time would have saved that country around 26 billion US dollars in training costs.

There needs to be greater realisation that uncontained health threats in developing countries also have implications for the developed world. The HIV/AIDS pandemic and global influenza outbreaks should have demonstrated this. It is in the interest of the entire global community that the health workforces of poorer nations should be sustained (WHO 2006).

Ultimately, however, it would seem that the greatest antidote to the 'pull' of international job offers lies in creating the conditions that make it desirable and possible to stay. The GCIM (2005) has advised developing-country institutions that are losing staff to be 'good employers'. The national and provincial departments of health would do well to bear this in mind and sharpen their efforts to recruit and retain good managers, from the ministry down. Complaints about public-sector administration featured prominently in the memorandum presented to the government after the doctors' protest march in 2004, and in interviews with the HSRC. In the Eastern Cape, we were told of equipment that did not arrive for months, salaries that were not paid on time, job applications that were not followed up.[6] Doctors here face long hours, and intolerably heavy workloads, in part because of shortages of other staff but also because of the pressures associated with HIV/AIDS. They often work in isolation from other medical colleagues and live in areas with inadequate infrastructure, few amenities and

6 For an example of the many calls for the resignation of Health Minister Manto Tshabalala-Msimang, see Blandy F, Scientists call for Manto's Removal, www.iol.co.za 6 September 2006

poor-quality housing (Breier & Wildschut 2006). This is apart from all the other discomforts that drive South Africans to emigrate: crime, affirmative action, the deteriorating state of public education (from the perspective of previously advantaged population groups) and uncertainties about the future. The retention of our doctors is ultimately a political problem requiring political solutions.

References

Awases M, Gbary A, Nyoni J & Chatora R (2003) *Migration of health professionals in six countries. A synthesis report.* Brazzaville: WHO/Afro

Breier M (2007) The shortage of medical doctors in South Africa. Case study report for the HSRC study: A multiple source identification and verification of scarce and critical skills in the South African labour market. Unpublished report for the Department of Labour

Breier M & Wildschut A (2006) *Doctors in a divided society: The profession and education of medical practitioners in South Africa*. Cape Town: HSRC Press

Carballo M & Mboup M (2005) *International migration and health*. Paper prepared for the Policy Analysis and Research Programme of the Global Commission on International Migration. Accessed 3 May 2006, www.GCIM.org

Christie P, Butler D & Potterton M (2007) *Schools that work: Report of ministerial committee*. Accessed 16 April 2008, www.education.gov.za

Clemens MA & Pettersson G (2008) New data on African health professionals abroad. *Human Resources for Health* 6(1). Accessed 7 January 2008, http://www.human-resources-health.com/content/6/1/1

Council for Medical Schemes (2006) *Annual report 2005/6*. Accessed 7 November 2007, www.medicalschemes.com

Dambisya YM (2003) Career intentions of Unitra medical students and their perceptions about the future. *Education for Health* 16(3): 286–297

De Vries E & Reid S (2003) Do South African medical students of rural origin return to rural practice? *South African Medical Journal* 93(10): 789–793

DoE (Department of Education, South Africa) (1999–2005) *Higher Education Management Information System (HEMIS)*. Pretoria: DoE

DoH (Department of Health, South Africa) (2003) *Operational plan for comprehensive HIV and AIDS care, management and treatment for South Africa*. Accessed 1 June 2005, www.doh.gov.za

DoH (2004) *Recruitment and employment of foreign health professionals in the Republic of South Africa*. Policy document 1 April 2004. Accessed 1 June 2005, www.doh.gov.za

DoH (2006a) *A National Human Resources for Health Planning Framework*. Pretoria: DoH

DoH (2006b) *Recruitment and employment of foreign health professionals in the Republic of South Africa*. Policy document 1 April 2006. Accessed 1 November 2007, www.doh.gov.za

Dovlo D (2004) The brain drain in Africa: An emerging challenge to health professionals' education. *JHEA/RESA* 2(3): 1–18

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

GCIM (Global Commission on International Migration) (2005) *Migration in an interconnected world: New directions for action.* Accessed 1 May 2006, www.GCIM.org

Grimwood A, Almeleh C, Hausler H & Hassan F (2006) HIV and tuberculosis treatment update. In Health Systems Trust *South African Health Review 2006*. Durban: Health Systems Trust. Accessed 7 November 2007, www.hst.org.za

Hagopian A, Thompson MJ, Fordyce M, Johnson KE & Hart LG (2004) The migration of physicians from sub-Saharan Africa to the United States of America: Measures of the African brain drain. *Human Resources for Health* 2(7). Accessed 1 November 2007, http://www.human-resources-health.com/content/2/1/17

Hall E & Erasmus J (2003) Medical practitioners and nurses. In Human Sciences Research Council *Human resources development review: Education employment and skills in South Africa*. Cape Town: HSRC Press

Halvorsen T (2005) Identity formation or knowledge shopping in times of globalisation. In T Halvorsen, G Mathisen & T Skauge (eds) *Identity formation or knowledge shopping: Education and research in the new globality*. Bergen, Norway: Norwegian Centre for International Cooperation in Higher Education (SIU)

Health Systems Trust (2004) *South African health review 2003*. Durban: Health Systems Trust

Health Systems Trust (2005) *South African health review 2004.* Durban: Health Systems Trust

Health Systems Trust (2007) *South African health review 2007*. Durban: Health Systems Trust. Accessed 7 January 2008, www.hst.org.za

Hudson CP, Kane-Berman J & Hickman R (1997) Women in medicine: A literature review 1985–1996. *SAMJ* 87(11): 1512–1517

Igumbor E & Kwizera E (2005) The positive impact of rural medical schools on rural intern choices. *Rural and Remote Health 5*: 417. Accessed 9 October 2006, http://rrh.deakin.edu.au/articles/subviewnew.asp?ArticleID=417

Lehmann U & Sanders D (2004*)* Human resources for health in South Africa. Background paper for JLI National Consultation, 3–4 September 2004, Cape Town

New Zealand Department of Labour (2005) *Skills shortages in New Zealand: Key findings from the survey of employers who have recently advertised 2005*. Accessed 23 August 2006, http://www.dol.got.nz/PDFs/lmr-skills-may2006.pdf

OECD (Organisation for Economic Co-operation and Development) (2004) The international mobility of health professionals: An evaluation and analysis based on the case of South Africa. In OECD *Trends in international migration*. Paris: OECD

OECD (2007) *Health data 2004*. Accessed 5 December 2007, http://www.OECD.org

Padarath A, Ntuli A & Berthiaume L (2003) Human resources. In Health Systems Trust *South African health review 2003*. Durban: Health Systems Trust. Accessed 10 July 2005, www.hst.org.za

Reid S (2002) Community service for health professionals. In Health Systems Trust *South African health review 2002.* Durban: Health Systems Trust. Accessed 10 July 2005, www.hst.org.za

Sanders D & Lloyd B (2005) Human resources: International context. In Health Systems Trust *South African health review 2005*. Durban: Health Systems Trust. Accessed 1 May 2006, www.hst.org.za

Sanders D & Meeus W (2002) *A critique on NEPAD's health sector plan of action*. Bellville: University of the Western Cape, School of Public Health

Saxe N & Van Niekerk JP de V (1979) Women doctors wasted. *South African Medical Journal* 55: 760–762

Shisana O, Rehle T, Simbayi LC, Parker W, Zuma K, Bhana A, Connolly C, Jooste S & Pillay V (2005) *South African national HIV prevalence, HIV incidence, behaviour and communication survey, 2005*. Cape Town: HSRC Press

Stats SA (Statistics South Africa) (2003) *Documented Migration, 2003. Report No. 03-51-03 (2003)*. Accessed 7 November 2007, www.statssa.gov.za

Stats SA (2004) *Population estimates for 2004*. Pretoria: Stats SA

Stats SA (2007) *Community survey 2007. Statistical release P0301*. Accessed 7 January 2008, www.statssa.gov.za

Wilson R, Woolard I & Lee D (2004) *Developing a national skills forecasting tool for South Africa*. Coventry: Institute for Employment Research, University of Warwick, and Pretoria: HSRC

WHO (World Health Organization) (2006) *Working together for health: The world health report 2006*. Accessed 7 November 2007, www.who.org

Interview

Aguirre JA, professor of pharmacology, Walter Sisulu University of Technology, Mthatha, 6 June 2005

CHAPTER 7

Nurses

Angelique Wildschut and Thando Mgqolozana

We are aware of the recent and constant discourse of 'skills shortages' in our labour market, and it is often difficult to ascertain whether these are purely perceived or cases in fact. This chapter attempts to more concretely identify and quantify nursing skills shortages in South Africa.

This chapter has six parts. Part one investigates the different media and stakeholders' assertions that there is a shortage of nurses. Part two attempts to quantify and profile the existing nursing labour force. Parts three and four will examine the supply of, and demand for, nurses respectively. Part five will consider the myriad issues influencing supply and demand in the nursing profession, while part six concludes by auditing the existing programmes to address skills needs and offering suggestions on the way forward.

The various professional levels of nurse discussed in this chapter are (from most senior to most junior): professional or registered nurse (PN or RN), enrolled nurse (EN) and enrolled nurse auxiliary (ENA). Sometimes PN is used interchangeably with RN, but usually the term PN is reserved for registered nurses who are comprehensively trained, which means that they have done a four-year programme at a university or public nursing college and their qualification includes midwifery, psychiatry and community health as well as general nursing.

Who says there is a shortage?

The shortage of health workforce is an international phenomenon (Dal Poz et al. 2006; Simoens et al. 2005; WHO 2006), where for instance a 'shortage of more than 4 million doctors, nurses, midwives and others' (WHO 2006: 11) is noted. The scholarly and media sources citing a nursing shortage in South Africa are abundant and varied (Hall & Erasmus 2003; McGrath & McGrath 2004; Woolard et al. 2003).[1] Similar assertions are also made by stakeholders in the field.

The South African Nursing Council (SANC) identifies a shortage of nurses in South Africa, but simultaneously presents a positive picture by noting past gains. Thus it asserts that 'although there may still be a shortage of qualified nurses in RSA, the positive side to this overall picture is that the growth in nursing figures has exceeded that of the population of South Africa by quite a margin' (SANC 2008). The Democratic Nursing Organisation of South Africa (DENOSA) also asserts that there is a shortage of nurses, stating that South Africa is 'not producing/training sufficient nurses to deal with its health

1 See also: More doctors, nurses needed in Aids fight, *Mail & Guardian Online* 16 August 2006, http://www.mg.co.za; More needed to win Aids war, *News24* 24 May 2007, http://www.news24.com.

needs' (DENOSA 2007), and recognises that this directly impacts on the ability of the health sector to deliver an efficient service.

Ms Hasina Subedar, registrar of the SANC, agrees that there are shortages of nurses in general in South Africa, as well as particular shortages at the PN level. However, she believes it is 'very difficult to quantify if there is a shortage or not…the only way you can…is if the health services identify what is their need' (Subedar interview). Unfortunately there have been many different and conflicting estimates and the National Human Resources for Health Planning Framework (hereafter referred to as the NHR Plan) of the Department of Health (DoH) (DoH 2006) has not provided clarity.

The NHR Plan states that traditionally, staffing levels have been determined by using ratio statements described as norms and standards. It does not specify what those norms and standards are in relation to the health professions, but criticises this approach for failing to take account of the demographics of disease. The plan suggests that we need a new approach to determining the staffing of health facilities but does not specify what this approach should be.

The NHR Plan identifies a shortage of health personnel (in general and in the public sector particularly) and the inequitable skills distribution between urban and rural areas as key challenges for the South African health sector. On nursing specifically, the report asserts that 'South African nursing has increasingly been described as experiencing a serious crisis' with 'a reported decline in nursing care' in general and in public health facilities particularly (DoH 2006: 65). The plan provides rough figures for 'current' (presumably 2005 or 2006) annual national production of the three different categories of nurses, PNs, ENs and ENAs, and proposes increases in annual production of 58 per cent, 60 per cent and 52 per cent respectively, bringing their proposed annual national production of PNs to 3 000 by 2011, of ENs to 8 000 by 2008 and of ENAs to 10 000 by 2008. This would increase total annual production of nurses (according to their figures) to 21 000, a 56 per cent increase on their estimate of current production and an even larger increase when compared with our own more specific figures (SANC registers show that an increase of 63 per cent would be necessary to bring our 2005 production of 12 837 nurses to 21 000).

These are some of the other estimates of nursing shortages:

- The National Scarce Skills List 2006 of the Department of Labour (DoL) (DoL 2006a) specifies registered nurses (RNs) and primary health care nurses as scarce skills. Quantifying the need in these occupations, the *Master List of Scarce and Critical Skills* (DoL 2006b) identifies a shortage of 14 370 nurses (10 250 RNs and 4 120 primary health care nurses). A primary health care nurse is a registered nurse who has been comprehensively trained or has a post-basic qualification in community health.
- The Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa (DoH 2003) indicates that for the effective care, treatment and management of HIV/AIDS alone, a total of 13 805 additional health care staff should be recruited by March 2008. Of these, 4 393 should be nurses (1 883 PNs, 1 255 ENs and 1 255 assistant nurses), in order to manage HIV/AIDS in our health care system.
- The Health and Welfare Sector Education and Training Authority (HWSETA) Draft Sector Skills Plan (SSP) 2006–2009 states that 'human resource development of the sector has been characterised by a shortage and maldistribution of appropriately trained health and social development workers' (HWSETA 2006: 25). A total of 3 480 nursing skills are prioritised as scarce, especially at National Qualifications Framework (NQF) Levels 4 and 5 (HWSETA 2006: 60), thus falling into the EN and ENA nursing categories.

- Hall & Erasmus (2003) estimate an overall gap between nursing supply and demand of 18 758 nurses between 2001 and 2011. The figures which they present in the HSRC's *Human Resources Development Review 2003* are often used to quantify nursing supply and demand and are quoted repeatedly in the HWSETA SSP of 2006.

In sum, many of the individuals and organisational stakeholders within the nursing profession claim a shortage, but attempts to quantify the perceived shortages present very different views and figures. Let us now examine our existing nursing labour force, compare this to the international benchmarks for health care, and relate it to the specific health care needs of South Africa to establish the basis for our own assertions about whether or not we have a nursing shortage.

Existing nursing labour force

The SANC and the Statistics South Africa (Stats SA) Labour Force Survey (LFS) are used as the best available data to estimate the total number of nurses in South Africa, given in Table 7.1. Data on nurses registered with the SANC are available for 2006, but we do not have the same data for the LFS. Table 7.1 indicates that in 2005, South Africa had a total of 191 269 nurses registered with the SANC. Of these, only 82.3 per cent were in employment, leaving 17.6 per cent inactive (most likely retired, out of the profession or working overseas). Nearly two-thirds were in the public sector.

It will be noted from Table 7.1 that the numbers in the public sector dropped by two per cent and the proportion of total active nurses who were in the public sector also dropped by two per cent between 2001 and 2005. This is alarming, considering that the vast majority of patients are in the public sector (approximately 85 per cent) and this figure is growing. As Table 7.2 shows, there were 189 641 fewer medical aid beneficiaries in 2005 than in 2001, a decrease of 2.7 per cent. This means that more people are likely to be seeking medical treatment in the public sector. At the same time (as Table 7.1 shows) while the public sector was losing nurses, the private sector was gaining them – numbers of nurses in the private sector rose by 7.2 per cent while their proportion of total active nurses grew 2 per cent between 2001 and 2005.

The trends above exacerbate conditions in the public sector, which also has a severe shortage of other health professionals. As Breier and Wildschut (2006) have shown, there is an even greater shortage of doctors in the public sector than of nurses, with only about 40 per cent of medical practitioners in the public service.

TABLE 7.1: *Total nurses in employment, 2001 and 2005*

	Year	Registered with SANC	Active nurses (LFS 2005)		Registered with SANC but not active		Public sector		Private sector	
		N	N	%	N	%	N	%	N	%
Registered	2001	190 449	155 484	81.6	34 965	18.4	97 423	62.7	58 061	37.3
	2005	191 269	157 501	82.3	33 768	17.6	95 248	60.4	62 253	39.5
Difference		+820	+2 017	+1.3	−1 197	−3.4	−2 175	−2.2	+4 192	+7.2

Sources: HST 2007; SANC 1997–2006; Stats SA 2005

TABLE 7.2: *Medical aid beneficiaries, 2001 and 2005*

Year	Total population	Medical aid beneficiaries	
		N	% of population
2001	44 328 322	7 025 262	15.84
2005	46 888 200	6 835 621	14.58
Difference	+2 559 878	−189 641	−2.7

Sources: HST 2007; SANC 2007

Profile of nursing staff

In this section, we provide a profile of the nursing workforce by professional category and age, and find that the majority are PNs and nearly two-thirds are over the age of 40.

Professional category

The SANC (2007) provides the following breakdown of its total (191 269) nurses on the registers for 2005: 52 per cent PN/RNs, 19 per cent ENs and 29 per cent ENAs. In 2006 (when nurses totalled 196 914), the proportions were 51 : 20 : 29 respectively. Whether these proportions are appropriate or not is discussed later in this chapter.

Age

It is important to examine the age profile of the South African nursing corps, to ascertain whether we have a current problem or an impending nursing crisis (see Table 7.3). SANC data show that in 2006, just over two-thirds (64 per cent) of nurses across all categories were over the age of 40 and about one-third (32.8 per cent) in the age group 40–49. Nearly four per cent of the total were already at retirement age or above (65+). The most worrying fact is that nurses in the age group <25–29 only comprise 8.9 per cent of the total workforce, revealing the small number of young nurses entering the profession, which is effectively turning nursing into an aging workforce. What is equally alarming is that these nurses are entering and practising the profession mostly at auxiliary level (67.5 per cent), while 69.5 per cent of those aged 60 or above are PN/RNs. This is a clear sign of a shortage of PNs in the near future.

Comparisons with international benchmarks

In estimating demand, we need to consider how South Africa compares with international benchmarks or norms. Here we consider norms for nurse-to-population ratios and optimum ratios of the different categories of nurses.

Nurse-to-population ratios

The *World Health Report 2006* (WHO 2006) relies on the Joint Learning Initiative (JLI) global assessment of shortfall, which states that countries with fewer than 2.5 health care professionals (counting only doctors, nurses and midwives) per 1 000 population will fail to reach the minimum desired level of 80 per cent health services coverage rate. It bases this measure on an estimation of the availability of health workers required to achieve a package of essential health interventions and the Millennium Development Goals (MDGs). There are 57 countries that fall below this threshold and are defined as having a critical shortage. Shockingly, 'thirty-six of them are in sub-Saharan Africa' (WHO 2006: 12).

TABLE 7.3: *Age distribution of nursing staff, by occupational category, 2006*

Age group	Registered		Enrolled		Auxiliary		Total	
	N	%	N	%	N	%	N	%
<25	63	0.06	782	1.9	1 754	3.1	2 599	1.3
25–29	3 090	3.00	4 215	10.7	7 694	13.6	14 999	7.6
30–34	9 298	9.10	5 137	13.0	8 274	14.6	22 709	11.5
35–39	13 810	13.50	6 189	15.0	7 909	14.0	27 908	14.1
40–44	17 438	17.10	6 949	17.6	7 751	13.7	32 138	16.3
45–49	18 953	18.60	6 221	15.8	7 592	13.4	32 766	16.6
50–54	15 071	14.80	4 674	11.8	6 003	10.6	25 748	13.0
55–59	10 299	10.10	2 573	6.5	4 241	7.5	17 113	8.7
60–64	7 225	7.10	1 329	3.3	2 521	4.4	11 075	5.6
65–69	3 765	3.70	589	1.4	817	1.4	5 171	2.6
>69	1 888	1.80	183	0.4	214	0.3	2 285	1.2
Not reported	1 032	1.00	508	1.2	1 556	2.7	3 096	1.6
Total	101 932	100.0	39 349	100.0	56 326	100.0	197 607[a]	100.0

Source: SANC 2007

Note: a. The SANC states on its website that the age statistics include nurses resident outside South Africa; thus totals may be slightly higher than other statistics applying to nurses resident in South Africa only.

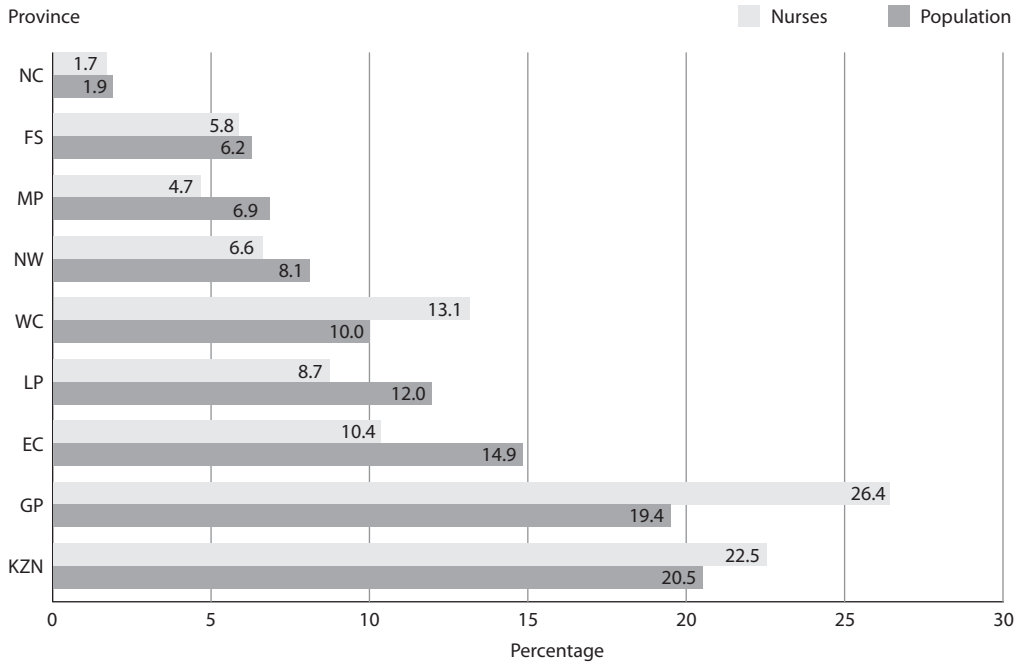
A closer examination of the map, however, indicates that South Africa is not among the countries within sub-Saharan Africa defined as experiencing a critical shortage of health care professionals.

Hall and Erasmus (2003: 540) referred to a WHO norm for nurses specifically of 200 nurses per 100 000 population and found that in 2001 South Africa had a ratio of 343 : 100 000, based on LFS data and population figures for that year. Similar data for 2005 show a ratio of 336 : 100 000, which represents a decrease on the earlier figures. So, rated against this WHO minimum norm, and only taking into consideration active nurses, we seem to have an adequate number of nurses for the population. Nonetheless one needs to remember that the norm is a very low minimum and the countries that fall below it are among the poorest in the world. One also needs to remember our very specific needs in South Africa, including, as the NHR Plan has noted, the demographics of disease in this country. Another important consideration is the type of nurse needed.

The SANC calculates nurse-to-population ratios based on its own list of RNs and ENs, which includes nurses who are not active. In 2006, the nurse-to-population ratio was 1 : 241 nationally.[2] However, this national figure conceals many regional disparities. Gauteng has the most favourable nurse-per-population ratio (1 : 177) and Mpumalanga (1 : 349) the worst. When we consider the disparities

2 This translates into 414 : 100 000, which appears to be more favourable than the previous figure of 336 : 100 000, but also includes nurses who are on the registers of the SANC but not in active service in the country.

FIGURE 7.1: *Comparison between nurse and population distribution, 2006*



Source: SANC 2007

Notes: NC = Northern Cape; FS = Free State; MP = Mpumalanga; NW = North West; WC = Western Cape; LP = Limpopo; EC = Eastern Cape; GP = Gauteng Province; KZN = KwaZulu-Natal

between provinces (see Figure 7.1), it becomes evident that the proportion of nurses in Gauteng, for example, is much greater than the proportion of the population located in Gauteng, while Mpumalanga is in a desperate situation, having an under-representation of nurses compared to their proportion of the population.

Professional-to-enrolled nurse ratios

While the NHR Plan of 2006 does not specify an optimum ratio of RN/PNs to ENs, the NHR Plan Task Team report for the DoH (2004, cited in Subedar 2005) specifies a ratio of 1 RN/PN : 2 ENs. Pretorius et al. (1997), cited in Hall and Erasmus (2003), identify the desired RN/PN : EN ratio for hospitals to be 1 : 3. The SANC registers show a ratio that is nearly the reverse: 2.7 RNs/PNs : 1 EN in 2005 overall and 2.1 RNs/PNs : 1 EN in the private sector.

Subedar (2005) estimated that in order for South Africa to obtain the ratio recommended in the NHR Plan Task Team report for the DoH, the number of ENs would have to increase nearly six-fold. However, as we showed earlier in this chapter when presenting the estimates of shortage by various stakeholders, there is no consensus as to whether we indeed need this many ENs or whether we need more PNs.

Supply of nurses

In this section, we examine the supply of nurses to establish whether current nurse-per-population ratios can be maintained with the current output. Hall and Erasmus (2003) suggest that if the current

nurse-per-population ratio (at that stage 343 : 100 000) is to be maintained, South Africa will need to keep the average annual supply at about 5 837, but this would still leave an overall shortage of 18 758 nurses by 2011. Let us see if their assertions still hold true.

The nursing education and training environment is complex, with training occurring at universities, colleges and private institutions. Table 7.4 presents the total output trends between 1997 and 2006, showing that overall we have a positive annual average growth rate of 9 per cent, and the average

TABLE 7.4: *Output of all nursing courses, every 4 years between 1997 and 2006*

	4-year programme: South African universities		4-year programme: South African nursing colleges		Nurses				Auxiliaries				Total	
					Public institutions		Private institutions		Public institutions		Private institutions			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1997	387	7	2 295	40	881	15	188	3	1 442	25	575	10	5 768	100
2000	408	7	2 086	35	1 217	21	702	12	271	5	1 238	21	5 922	100
2003	453	5	1 108	13	1 352	16	956	12	522	6	3 868	47	8 259	100
2006	534	4	1 493	12	1 442	12	3 374	28	1 166	10	4 256	35	12 265	100
Total	4 211	5	15 975	19	13 205	16	14 696	18	7 462	9	27 059	33	82 608	100
Growth (%)	38		−35		64		1 695		−19		640		113	
Average annual growth (%)	4		−5		6		38		−2		25		9	
Average output (N)	421		1 598		1 321		1 270		746		2 706		8 261	

Source: Author's calculations based on data from SANC 2007

Note: This data excludes bridging programmes.

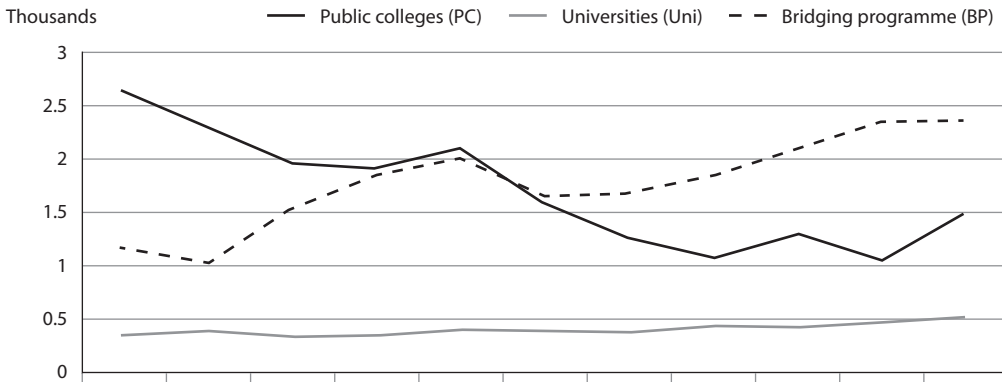
annual output is 8 261 nurses. This is significantly higher than the average output calculated by Hall and Erasmus (2003) for the period 1991–2000 (5 837). Based on this updated information, the estimated gap between nursing supply and demand by 2011 (at that stage estimated to be 18 758) could be substantially reduced, assuming that demand stays as forecasted. However, as we will show later, there is a very large gap between output from training institutions and actual registration as a nurse.

We also need to consider whether the supply trends indicated in Table 7.4 are actually in accordance with the country's needs, particularly in the public sector, which serves the large majority of the population.

We noted earlier the high proportion of PNs in relation to ENs, whereas some stakeholders believe the opposite would be optimum.

Numbers of ENs dropped following the introduction of the bridging programme in 1989 which enables ENs to become RNs in two years. Although the bridging programme represents an important opportunity for nurses to advance personally, the overall effect for nursing provision is not ideal. The bridging programme has not only reduced the ranks of ENs, it also does not produce comprehensively trained nurses. Those who become RNs in this way are qualified only to do general nursing. Breier et al. (2009) show that there were more PN/RNs produced through the bridging programme in 2006 than through the four-year programmes offered by universities and colleges. This means that of the 4 391 PN/RNs produced that year, only 54 per cent were qualified to practise comprehensively, which is necessary in a primary health care setting. Figure 7.2 shows the changing trends in professional nurse production: the declining contribution of public colleges, many of which have been closed or merged, the limited and only gradually increasing contribution of universities, and the rapid increase in output from bridging programmes.

FIGURE 7.2: *Overall professional nursing output, 1996–2006*



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
PC	2 629	2 295	1 990	1 911	2 086	1 633	1 252	1 100	1 288	1 058	1 493
Uni	360	387	381	351	408	408	400	453	428	475	534
BP	1 169	1 033	1 539	1 839	1 991	1 670	1 679	1 841	2 103	2 352	2 364

Source: SANC 2007

What is of even greater concern is the fact that many of the PNs quantified in Table 7.4 do not actually enter the profession, in this country at least, or they exit some time after registering, as is shown in the next section.

Growth in registers

The rate of growth in the total number of nurses on the SANC registers between 1996 and 2006 has exceeded the population growth over this period. While the South African population increased by approximately 12.5 per cent from 42.1 million in 1996 to 47.4 million in 2006, the total number of nurses on the SANC registers increased by 14.1 per cent, from 172 520 (1996) to 196 914 (2006).

However, in the absence of definitive calculations as to the numbers and types of nurses needed in this country, we cannot say that the increases in the particular categories are appropriate: PNs increased by 15 per cent, ENs by 19 per cent, and ENAs by 9 per cent (SANC 2007). In 2006, as stated earlier, the proportion of PNs to ENs was 2.7 : 1. There are assertions that the proportion needs to be reversed to 1 : 3 or 1 : 2. However, there are others who say that we need even more PNs than we already have, because many PNs are close to retirement age. We need especially large increases in comprehensively trained nurses, because there have been decreases in college output, only small increases in university output, and the bulk of the increase at PN level is through the bridging programme. A further major concern is that PN/RNs are not entering the profession at the rate they should be, given the increase in production.

Table 7.5 shows the calculation of the difference between PNs produced between 1996 and 2006 (42 900), and growth in the SANC register during the same period. Taking into account that, for instance, 2006 graduates will only register in 2007, and the 2006 register will not yet reflect those additional numbers, it makes sense to consider the year-on-year growth rates, to get a more accurate picture of the rate of attrition between graduation and registration.

TABLE 7.5: *Year-on-year growth of registers of professional nurses, 1996–2006*

	Increase in PNs registered (N)	Increase in PNs registered who graduated in previous year (%)
1996–1997	2 224	53.5
1997–1998	1 004	27.0
1998–1999	1 379	35.3
1999–2000	913	22.3
2000–2001	1 249	27.8
2001–2002	396	10.7
2002–2003	1 767	53.0
2003–2004	1 775	52.3
2004–2005	1 044	27.3
2005–2006	1 761	45.3
Total additional RNs/RMs on SANC register, 1996–2006	13 512	35.1

Source: Authors' calculations from SANC 2007 data

Analysis of these figures shows that only 35 per cent of PNs graduating during the period are reflected on the registers, leaving us with an attrition rate of 65 per cent. Why does the number of nurses produced not reflect reasonably on the registers? Do we lose so many nurses to emigration, or is the extent of AIDS-related health worker attrition under-estimated? What has emerged from interviews, and thus can only be anecdotally offered as a reason for attrition between graduation and registration, is the effect of bursaries (see Breier et al. 2009). Many students register for a nursing degree as a means to gain access to a university education, and often end up practising in another field, or change specialisation to end up in related but different fields. This represents a tremendous loss to the South African health system.

So it seems that we lose a great many nurses between graduation and registration, and if one considers further that about 20 per cent of those on the SANC register are not active in the South African health care system, and greater proportions of nurses are now moving to private institutions, we begin to understand why many stakeholders might be perceiving, and at grassroots level (especially in public facilities) experiencing, nursing shortages.

Demand for nurses

Let us now examine indications of the demand for nurses. Using vacancy rates as a recognised indicator of labour shortages, and a reflection of the current demand for nurses, we first analyse occupational data arising from the DoL's Labour Market Information and Statistics unit (LMIS) (Erasmus 2008). The second part of the demand analysis will evaluate the survey of employers who recently advertised vacancies in the *Sunday Times* (Erasmus 2008).

Analysis of the DoL's job vacancy database

Specifically considering the results for nurses, analysis of the DoL database (Table 7.6) indicates the following:

- The largest share of midwife and nurse advertisements was placed in search of RNs (96.84 per cent).
- The concentration of RNs (and the small number of advertised vacancies for midwives) may be ascribed to job titles wrongly captured or classified according to the Organising Framework for Occupations (OFO) (INSETA 2007), as midwives are also RNs.

Further, the most vacancies were advertised in the public sector, indicating that the greatest demand for nursing professionals and associates exists within this sector (Table 7.7). During the period April 2006–March 2007, only 3 per cent of total nursing vacancies were advertised in the private sector, and 97 per cent in the public sector.

We are only able to compare the above data to Health Systems Trust (HST) information on the percentage of PN posts vacant, as they do not provide figures on the total number of nursing vacancies. Thus, in Table 7.8, we see that about 36 per cent of PN posts are vacant. This represents a 4.8 per cent increase in vacant PN posts in the public sector from 2006, which could in part be attributed to the earlier observation that more nurses are apparently moving into the private sector.

From the DoL vacancy data, as well as HST data, we can assert that the greatest demand appears to be for PNs in the public sector. However, we also need to bear in mind that vacancy numbers might not be an entirely accurate reflection of demand in a particular occupation because they might represent frozen posts.

TABLE 7.6: *Number and share of vacancies for midwifery and nursing professionals, by year and unit group, 2004–2007*

OFO occupational group	Number of vacancies published				Share of vacancies %			
	2004/05	2005/06	2006/07	Total over 3 years	2004/05	2005/06	2006/07	Total over 3 years
Midwifery and nursing professionals total[a]	1 904	3 482	2 233	7 619	41.24	44.69	35.76	40.85
Midwives	0	0	6	6	0.00	0.00	0.27	0.08
Nurse educators & researchers	60	39	16	115	3.15	1.12	0.72	1.51
Nurse managers	47	28	45	120	2.47	0.80	2.02	1.58
Registered nurses	1 797	3 415	2 166	7 378	94.38	98.08	97.00	96.84

Source: Erasmus 2008

Note: a. The 'total' number of advertised job vacancies relates to the total number appearing in the OFO recoded database, rather than the total number of advertisements placed.

TABLE 7.7: *Total number of nursing professional and nursing associate vacancies, by sector, April 2006–March 2007*

Sector	Nursing professionals	% of total	Nursing associates	% of total	Total for sector	% of total
Private	68	3	3	1	71	3
Public	2 165	97	282	99	2 447	97
Not stated	0	0	0	0	0	0
Total	2 233	100	285	100	2 518	100

Source: Erasmus 2008

TABLE 7.8: *Percentage of professional nurse posts vacant, 2006 and 2007*

	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpuma-langa	Northern Cape	North West	Western Cape	South Africa
2006 public sector	34.0	31.4	26.0	42.5	15.0	40.0	33.2	22.8	22.0	31.5
2007 public sector	35.8	35.7	39.9	42.0	20.0	40.2	35.9	42.4	23.8	36.3

Source: HST 2007 using 2006 and 2007 PERSAL data

TABLE 7.9: *Short questionnaire survey results for midwifery and nursing professionals vacancies*

OFO occupational group	Interviewed	Vacancies	Filled	Fill rate	Applicants	Suitable	Rate
Midwifery and nursing professionals	43	319	180	56.43	1 058	381	36.01
Nurse managers	1	1	1	100.00	20	11	58.33
Registered nurses	42	316	177	56.01	1 038	370	35.65

Source: Erasmus 2008

Survey of employers recently advertising vacancies in the *Sunday Times*

The second part of the vacancy study drew on the methodology of a New Zealand survey of employers (NZ DoL 2005). This study regards the fill rate as a key indicator of skill shortage, asserting that occupations with fill rates lower than 80 per cent are regarded as experiencing shortage.

The respondents collectively reported 799 vacancies, of which 57.20 per cent were filled. A fill rate below 80 per cent was recorded at every minor-group level of occupations in the health professions. The fill rate for midwifery and nursing professionals was 56.43 per cent. In terms of the New Zealand DoL study's approach, this does indicate a definite shortage.

If we examine Table 7.9 closely, it can be noted that shortages were not necessarily experienced across all occupations within a minor group. In the case of midwifery and nursing professionals, it was RNs who were in short supply, with a 56 per cent fill rate. Also, even in the in-depth questionnaire survey results (Erasmus 2008), all the respondents had made appointments but had managed to fill only 37 of the 72 vacancies, amounting to a fill rate of 51.39 per cent.

In addition to these quantitative aspects of the supply/demand situation, it is important to discuss the qualitative factors influencing the extent of demand for, and supply of, health care services. The next section of the chapter turns to this issue.

Qualitative factors influencing supply/demand

Political and economic changes in South African society have impacted on the demand for health services, and now 'large sections of the population, who never had access to health care before, are entitled to free health services' (Hall n.d.: 8). This enlarged demand has to be addressed by a shrinking nursing corps, under unsatisfactory working conditions in public health facilities. The factors identified as extensively influencing the present and future demand and supply of nurses are: poor working conditions and professional environment;[3] low remuneration (Dewar cited in Hall & Erasmus 2003); HIV/AIDS; and migration (Capdevila 2007; Scott et al. 2004). Recognising the severe impact of both HIV/AIDS and migration on demand and supply, we will elaborate on these two factors below.

3 Sookha B, Chronic shortage of health staff, *Daily News* 1 February 2007; The top ten moans of nurses, *The Citizen* 23 May 2006

TABLE 7.10: *Total additional staff to be recruited by the DoH, 2004–2008*

Category of staff	Through March 2004	April 2004– March 2005	April 2005–March 2008
Medical officers	76	271	628
Professional nurses	228	813	1 883
Enrolled nurses	152	542	1 255
Assistant nurses	152	542	1 255
Pharmacists	76	271	314
Pharmacist assistants	76	271	314
Dieticians/nutritionists	76	136	314
Social workers	38	136	314
Community health workers	760	2 710	6 275
Administrative clerks	152	542	1 255
Total	1 786	6 234	13 807

Source: DoH 2003

The South African health care and services environment is profoundly influenced by the HIV/AIDS epidemic, often making it impossible for nurses to fulfil their duty of supporting those in need and providing care. It is important to be cognisant of three broad aspects of this situation in order to understand more accurately the AIDS-related nursing demand estimations to which it gives rise: the impact it has on the South African population at large; its impact on the health care system; and its effects on the health care workers within that system.

As stated earlier, the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa (DoH 2003) estimated the total additional need for nurses due to HIV/AIDS as 4 393 between April 2005 and March 2008 (1 883 PNs, 1 255 ENs and 1 255 ENAs) (see Table 7.10). These staffing estimates are calculated using the estimated number of persons with HIV/AIDS, and present recruitment needs based on the assumption that all anti-retroviral (ARV)-related treatment represents an additional workload for health professionals. The table not only illustrates the importance of, or need for, large numbers of nurses in order for such a plan to be effective, but also shows that the greatest need is actually for community health workers (6 275). They comprise 46 per cent of the total additional staff needed, whereas the total number of nurses (PNs, ENs and ENAs) comprises the second-largest need (32 per cent).

Migration

According to the *World Health Report 2006*, 7 per cent of South Africa's total nurses and midwives are working in Organisation for Economic Co-operation and Development (OECD) countries, compared to 1 per cent of Angola's nurses and midwives and 34 per cent of Zimbabwe's (WHO 2006).

Table 7.11 presents the official migration statistics of the SANC. The table shows the numbers of requests for verifications of qualifications and transcripts of training, which a nurse needs to supply when seeking work in a foreign country. Note that the 2005 SANC figure is for verifications up to April only, and also that the figures do not represent actual migrations, although they are indications of intent.

TABLE 7.11: *Requests for verification of qualification and transcripts of training by South African nurses residing in other countries, 2001–2005*[a]

Country of request	Year of request					
	2001	2002	2003[b]	2004	2005[c] (January–April)	Total
Australia	430	461	467	347	136	1 841
Canada	87	38	108	27	10	270
Ireland	253	528	109	32	5	927
Namibia	28	–	17	8	7	60
New Zealand	237	161	156	57	18	629
United Arab Emirates	41	10	55	10	2	118
UK	2 567	2 336	2 790	1 746	379	9 818
USA	267	420	360	163	67	1 277
Other countries	28	48	49	21	14	160
Annual total	3 938	4 002	4 096	2 411	653	15 100
Number on register	172 338	172 869	177 721	184 459	191 269	–
% of total number of nurses on SANC register	2.3	2.3	2.3	1.3	0.3	–

Source: SANC 2007

Notes: a. These figures indicate the number of persons who have requested that verification of qualifications and/or transcripts of training be sent to the countries indicated and nothing else. Nurses are not required to notify the SANC if they do leave the country. Therefore the fact that a nurse has requested that verification be sent does not necessarily mean that she/he has taken up the offer of a (nursing) position in another country.

b. The total also includes 15 verifications from the Arabian Gulf.

c. The total also includes 15 verifications from the Arabian Gulf.

The trends in Table 7.11 are in line with those suggested by Hall and Erasmus, who estimate that 'the exodus of nurses will continue at an annual rate of between 1 and 2 per cent' (2003: 542). This table would then suggest that although nursing migration has decreased since 2003, the annual loss is still between 1 and 2 per cent of the South African nursing workforce. The cumulative loss between 2001 and 2005, based on the above figures, is thus approximately 8 per cent, which is also in line with the *World Health Report*'s estimation that about 7 per cent of South African nurses and midwives are working in OECD countries (WHO 2006).

In the next section, we evaluate some of the initiatives that government has put in place in an effort to address or alleviate shortages in the short, medium and long term.

Existing initiatives to address shortages

In examining the policy and industry initiatives put in place in an effort to address the shortages discussed above, we need to ascertain the following: what types of nursing shortage they are aimed at addressing; whether the programmes put in place correspond to the shortages identified; and whether the programmes are integrated with each other.

Initiatives for addressing shortages can be aimed at influencing education and training, altering staffing and/or altering working conditions for nurses (Pindus et al. 2002). In the absence or slow progress of some government initiatives, the health industry has come to the table, and thus the examples discussed below are a mixture of both government and industry-led initiatives.

Short-term initiatives

- *Importing skills*: Private hospital groups (Medi-clinic and Netcare) are recruiting professional nurses from India, most specifically to work in their Western Cape intensive care unit wards, where they allege the shortage to be most critical, as a short-term solution to shortages in specific nursing areas.[4]
- *Using retired nurses*: This strategy is often used at various specific times of sudden shortage, as was shown during the public-sector strike of 2007,[5] and also in 2004 (Nyansula 2004).

Medium-term initiatives

- *Repatriation, recruitment and retention initiatives*: The WHO launched a programme, 'Treat, Train, Retain', to increase the number of medical workers in sub-Saharan Africa and give them better resources to fight HIV/AIDS (*Mail & Guardian* 16 August 2006). Medi-clinic initiated 'retention bonuses', and has reported positive results which have seen it lose fewer staff to its competitors.[6] Government has appealed to Britain to limit recruitment of South African nurses, leading to the *British Guidelines on International Nursing Recruitment* (ICN 2007). In 2004, the DoH established a task group to develop an International Code of Practice on the Ethical Recruitment of Health Workers.[7]
- *Emphasising critical thinking*: This is not expressly a retention strategy, but indirectly impacts on the propensity for retention. Nurses are trained to deal innovatively with the reality of resource-constrained working environments in the South African public service, which results in a better likelihood of retaining them.
- *Allowances*: In 2004, the government introduced a Scarce Skills Allowance to act as an incentive for nurses to specialise, and to obtain more nurses in particular specialisation fields (DoH 2004a, 2004b). The Rural Skills Allowance was instituted as a way to attract more nurses to the rural areas, providing them with higher remuneration as compensation for working in often remote rural communities. The allowances are aimed at addressing the dual inequity in the distribution of health professionals – between the private and public sectors and between rural and urban areas, acknowledging 'the critical role of professional nurses in such areas' (DoH 2004a, 2004b).
- *Remuneration structures*: In September 2007, the DoH introduced an Occupation Specific Dispensation for nurses which increased salaries by up to 88 per cent and was designed to 'improve government's ability to attract and retain skilled employees, through improved remuneration' (DoH 2007a).

4 Thom A, Private hospitals 'import' nurses from India, *HealthE* 16 May 2007, http://www.health-e.org.za
5 Cullinan K, Recruiting retired nurses is 'elderly abuse', *HealthE* 17 May 2007, www.health-e.org.za
6 Thom A, Private hospitals 'import' nurses from India, *HealthE* 16 May 2007, http://www.health-e.org.za
7 Shacinda S, Emigration of nurses cripples Aids fight, *Independent Online* 10 November, http://www.iol.co.za

Long-term initiatives

- *Increased training and focus on primary health care*: The Eastern Cape Health Department has set aside R170 million to train more nurses and improve health service in public hospitals; the department has allocated more than R3 000 per month to each of the 450 matriculants expected to receive nursing training for 4 years.[8] Network Healthcare Holdings increased its nurses' training budget in 2007 by 49 per cent, from R36.5 to R59 million, while Life Healthcare increased its training activities from 297 students in 1999 to 2 154 in 2003 (HASA 2003).
- *Public-private partnerships*: A public-private partnership has been formed between Afrox Healthcare (now Life Healthcare) and the Gauteng Department of Health, with the introduction of a neonatal intensive care unit nurse training programme in 2003 (HASA 2003).
- *Bursaries:* In order to address the crisis of nursing shortages, the provincial government of the Western Cape decided that it would offer bursaries, each worth R24 000 (at 2004 values) to the University of the Western Cape for a four-year degree programme in nurse training, in addition to bursaries for students registering at the Western Cape College of Nursing (UWC n.d.).
- *Increasing training capacity*: Not only are there initiatives to increase training at education institutions, but there has also been a review of nursing colleges, with the national DoH deciding to re-open colleges that had been closed, as they realised the extent of the need for more nursing staff in the country.[9]

Although this is not a complete and comprehensive account of all the initiatives put in place to ameliorate nursing shortages, the majority of those discussed here seem to be concentrated on medium- to long-term strategies. On this evidence, it can be asserted that government and industry have identified both instances of *relative scarcity* (as seen in the recruitment and retention strategies, and increasing pay scales), as well as the existence of *absolute scarcity* (as seen in the initiatives to increase education and training levels, and adjustments to migration policy).

Conclusion and recommendations

In terms of the most prominent indicators of shortages in the nursing profession, the nature of nursing shortages in South Africa has been established in this chapter as follows:

- *Desired level of health worker coverage 80 per cent:* The *World Health Report 2006* identifies sub-Saharan Africa as having a critical shortage of health professionals (counting only doctors, nurses and midwives), but South Africa is not defined as having a critical shortage measured against this indicator.
- *80 per cent fill rate:* A below-80 per cent fill rate was recorded at every minor-group level of occupations in the health professions. The fill rate for midwifery and nursing professionals was 56.43 per cent, and thus in terms of the New Zealand DoL 2005 study, this does indicate a definite shortage of nurses in South Africa.
- *Aging workforce:* The highest concentration of nurses in South Africa is in the age group 40–49, amounting to 32.8 per cent of nurses, and nurses in the age group <25 only comprise 1.3 per cent of the total workforce; this illustrates the low number of young nurses entering the profession.
- *WHO minimum norm:* According to the minimum norm of the WHO, South Africa has enough nurses (336 per 100 000 population in 2005). However, one should be careful when employing this norm across all provinces and urban-rural areas in South Africa, as these regions vary immensely and adequacy in absolute numbers may disguise inadequate supplies of nurses in critical nursing specialisations, as well as disparities of supply across public/private distribution.

8 Nofemele B, R170m boost for nurses' training in Eastern Cape, *The Herald* 13 May 2005
9 The top ten moans of nurses, *The Citizen* 23 May 2006

Two out of these four indicators reveal a nursing shortage in South Africa. It is, however, difficult to assert whether nursing shortages exist in the South Africa health care system as a whole. We seem to have two major problems: attrition between graduation and registration, and then further attrition between nurses on the register and those active in the workforce.

Recommendations

There seems to be a disjuncture between the identification of shortages and the policies put in place to address them. The present research does not provide convincing evidence that the nursing shortage is an issue of problematic supply, and thus questions an emphasis on increased training. If we need more nurses at certain levels and in certain specialisations, in certain provinces, and in a certain health care sector, should the policy response not expressly be focused at a national level on retention, with short- and long-term initiatives being secondary? If there is an identification of the priority of medium-term initiatives, this should filter through more effectively to NHR Plan policies at provincial level.

Initiatives should correspond to correctly identified shortages

Some of the initiatives seem to focus on more long-term solutions to shortage, emphasising training and providing more capital investment for the education of nurses, which are more appropriate to instances of absolute shortages.

It is not clear whether national government has identified medium-term initiatives as its focus in trying to ameliorate the impact of nursing shortages caused by maldistribution. A more concerted response is needed. We agree with the current approach to the situation in which initiatives spanning the entire spectrum from short- and medium- to long-term strategies are in place to provide a comprehensive response to the different types of nursing shortages experienced. But without identification of which types of initiatives should take precedence, this could lead to haphazard implementation of strategies without a clear focus on the particular needs of the country.

The National Health System does undertake to plan and develop human capital strategies linked to the needs of the recipient communities (DoH 2006), and thus the NHR Plan advocates a Nursing Strategy for South Africa, identifying these urgent needs:

- improved remuneration of nurses;
- improved conditions of service;
- increased production;
- review of nursing qualifications;
- review of scopes of practice.

In September 2007, the DoH introduced an Occupation Specific Dispensation whereby nurses received salary increases of up to 88 per cent. It remains to be seen whether these increases will be sufficient to stem the tide of attrition and overcome the shortages in key areas of our health sector. The most pressing problem identified by the present study is this issue of maldistribution between provinces, across rural and urban areas, and between the public and private sectors. Thus strategies and initiatives aimed at ameliorating the impact of nursing shortages should be concentrating on the following: the retention of the nurses we are producing; recruiting nurses now practising in other fields back into the profession; and identifying specific provinces and areas where shortages exist, as well as whether the shortages are in the public or private sectors.

There should be congruence between the different strategies

The tools used by government to quantify the need for nurses seem not to be accurately based on a comprehensive assessment of demand in certain areas, at the correct skills levels, and further, in the correct specialisations. More specifically, there is a disjuncture between the assertions of different government skills needs assessment and indicator tools. Whereas the Master List of Scarce and Critical Skills (DoL 2006b) would imply the importance of training more PNs, the NHR Plan more strongly proposes the increased production in higher numbers of lower levels of nurses (more ENs and ENAs).

A clear flaw in the NHR Plan is that it does not take into account the rise in human resources (HR) needs brought about by the impact of HIV/AIDS, even though it clearly recognises the importance of developing needs estimations based on the changing disease burden in different South African communities. Further, the DoH's HIV and AIDS and STI Strategic Plan 2007–2011 (DoH 2007b), to its credit, does recognise the shortage of HR as a critical challenge in the health sector, and advocates the need to audit what is currently available. But it does not do this in a concerted manner, with only scattered references throughout the document that recognise the critical importance of HR to addressing the HIV/AIDS epidemic. There also seems to be no attempt to quantify the HR needed. The NHR Plan is severely lacking, in that it clearly disregards the impact of HIV/AIDS on HR, only noting exposure to HIV/AIDS and other infectious diseases as a difficulty experienced by HR in the health sector.

Further, although acknowledging the different intentions and purposes of the Master List of Scarce and Critical Skills (DoL 2006b) in comparison to the Quota List of Scarce and Critical Skills (DoL 2006c), it is worrying that even though the latter should follow from the assertions of the former, particularly with regard to health professionals, the former does not identify research and development pharmacologists in its list, while the latter refers to this occupation as having a situation of absolute scarcity, thus needing to be included and quantified in terms of the Department of Home Affairs Work Permit Quotas. Understandably, we are confused!

Further, the research for this report revealed a dearth of independent quantitative survey research to more accurately profile the nursing skills needs and demands in order to estimate relevant skills gaps. Although providing some information relating to skills supply and demand, the HWSETA does not appear to have fulfilled its mandate in this regard. Thus there should be a greater congruence between the various estimations of shortages, as well as between the different strategies suggested to alleviate these shortages. Moreover, and finally, in an effort to more appropriately and effectively address the nursing shortage in South Africa, it is imperative that shortages be correctly identified at all nursing levels, as well as in specific sectors, so that the strategies put in place to address the shortages take into consideration the unique health context of the country.

References

Breier M & Wildschut A (2006) *Doctors in a divided society: The profession and education of medical practitioners in South Africa*. Cape Town: HSRC Press

Breier M, Wildschut A & Mgqolozana T (2009) *Nursing in a new era: The profession and education of nurses in South Africa*. Cape Town: HSRC Press

Capdevila G (2007) Health: Brain drain hits poor countries hard. Inter Press Service. Accessed 7 November 2007, http://ipsnews.net/news.asp

Dal Poz MR, Quain EE, O'Neil M, McCaffery J, Elzinga G & Martineau T (2006) Addressing the health workforce crisis: Towards a common approach. *Human Resources for Health* 4(21). Accessed October 2007, http://www.human-resources-health.com/content/4/1/21

DENOSA (Democratic Nursing Organisation of South Africa) (2007) *Key decisions taken by the DENOSA NEC 19–21 October 2007*. Accessed 24 October 2007, http://www.DENOSA.org.za/necmed1.html

DoH (Department of Health, South Africa) (2003) *Operational plan for comprehensive HIV and AIDS care, management and treatment for South Africa*. Pretoria: DoH

DoH (2004a) *Substantial allowances ready to roll for health professionals*. 28 January 2004. Accessed 28 November 2007, www.doh.gov.za

DoH (2004b) *Conference on health in the rural nodes*. Accessed 28 November 2007, http://www.doh.gov.za/docs/sp/2004/sp0921.html

DoH (2006) *A National Human Resources for Health Planning Framework*. Pretoria: DoH

DoH (2007a) *Occupation specific dispensation (OSD) in the public service*. Pretoria: DoH

DoH (2007b) *HIV and AIDS and STI strategic plan for South Africa, 2007–2011*. Pretoria: DoH

DoL (Department of Labour, South Africa) (2006a) *The national scarce skills list (Asgisa aligned)*. Pretoria: DoL

DoL (2006b) *Master list of scarce and critical skills as at 8th August 2006*. Pretoria: DoL

DoL (2006c) *Quota list of scarce and critical skills as at 8th August 2006*. Pretoria: DoL

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies in Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Commissioned by the Department of Labour, Pretoria

Hall E (n.d.) *The challenges HIV/AIDS poses to nurses in their work environment*. Employment and Economic Policy Research, HSRC, Pretoria

Hall E & Erasmus J (2003) Medical practitioners and nurses. In *Human resources development review 2003*: *Education, employment and skills in South Africa*. Cape Town: HSRC Press

HASA (Hospital Association of South Africa) (2003) *Nurse training partnership*. 8 December. Accessed September 2007, http:www.hasa.co.za

HST (Health Systems Trust) (2007) *Health statistics*. Accessed 27 October 2007, http://www.hst.org.za/healthstats/index.php?indtype_id=004002004

HWSETA (Health and Welfare Sector Education and Training Authority) (2006) *Draft sector skills plan 2006–2009*. 30 November. Pretoria: HWSETA

ICN (International Council of Nurses)(2007) *British guidelines on the international nursing recruitment*. Accessed 9 July 2007, http:www.icn.ch

INSETA (Insurance Sector Education and Training Authority) (2007) *Organising Framework for Occupations (OFO)*. Accessed 24 October 2007, http:www.inseta.org.za

McGrath A & McGrath S (2004) Nursing skills and knowledge. A proposal written for the Human Resources Development Research Programme of the Human Sciences Research Council, Pretoria

Nyansula D (2004) *Africa losing nurses to Britain: Nutrition and care for PLWHA*. Accessed 28 November 2007, http://www.afronets.org

NZ DoL (New Zealand Department of Labour) (2005) *Skills shortages in New Zealand*. Accessed 23 August 2006, http://www.dol.govt.nz

Pindus N, Tilly J & Weinstein S (2002) *Skills shortages and mismatches in nursing related health care employment*. US Department of Labour, Employment and Training Administration. Washington: The Urban Institute

SANC (South African Nursing Council) (1997–2006) Datasets on nursing enrolments and graduations. Accessed 1 October 2007, http://www.SANC.co.za/stats.htm.

SANC (2007) Datasets on population. Accessed 1 October 2007, http://www.SANC.co.za/stats/stat_ts/Growth%201997-2006_files/frame.htm

SANC (2008) *Growth in the registers and rolls, 1998–2007*. Accessed 2 June 2008, http://www.SANC.co.za/stats/stat_ts/Growth%201998-2007_files/frame.htm

Scott L, Whelan A, Dewdney J & Zwi B (2004) Solving health workforce shortages with professionals from developing countries. *The Medical Journal of Australia* 180(4): 174–176

Simoens S, Villeneuve M & Hurst J (2005) *Tackling nurse shortage in OECD countries*. Organisation for Economic Co-operation and Development Health Working Papers No. 19, Directorate for Employment, Labour and Social Affairs. Paris: Organisation for Economic Co-operation and Development

Stats SA (Statistics South Africa) (2001) *Labour Force Survey*. Pretoria: Stats SA

Stats SA (2005) *Labour Force Survey*. Pretoria: Stats SA

Subedar H (2005) Nursing profession: Production of nurses and proposed scope of practice. In Health Systems Trust *South African Health Review 2005*. Durban: Health Systems Trust

UWC (University of the Western Cape – Department of Nursing) (n.d.) *Nurses care*. Accessed 10 December 2007, http://www.uwc.ac.za/portal/faculty_department/nursing/about_us.htm

WHO (World Health Organization) (2006) *World health report 2006: Working together for health*. Geneva: WHO Press

Woolard I, Kneebone P & Lee D (2003) Forecasting the demand for scarce skills, 2001–2006. In A Kraak & H Perold (eds) *Human resources development review 2003*: *Education, employment and skills in South Africa*. Cape Town: HSRC Press

Interview

Subedar, Hasina, registrar of the South African Nursing Council, November 2006, Pretoria

CHAPTER 8

Law professionals

Shane Godfrey

It is well known that South Africa has a serious skills shortage. The new skills development dispensation introduced by the government in 1998, underpinned by the Skills Development Act (No. 97 of 1998), appears to have made little inroad into the shortage. The latest macro-economic growth strategy, the Accelerated and Shared Growth Initiative for South Africa (Asgisa), has focused attention on skills, making the elimination of the shortage a priority in order to achieve the six per cent economic growth rate that it has set as a target for the country in order to halve unemployment and poverty by 2014 (Asgisa 2007).

A key aspect of the aim of eradicating the skills shortage is identifying and measuring what have been variously described as 'scarce', or 'critical', or 'scarce and critical', or 'priority', or 'critically scarce' skills (Umhlaba Skills Services 2007: 1). But before one can measure and tackle scarce and critical skills it is necessary to understand what the terms mean. Unfortunately, there has been and still is a great deal of confusion in this regard. In 2005, the Department of Labour (DoL) proposed the following definitions:

- Scarce skill refers to the inability to find suitably qualified and experienced people to fill occupational vacancies either at an *absolute* level of scarcity (no suitable people available) or at a *relative* level of scarcity (i.e. no suitable equity candidates available or no suitable people available in certain regions).

- Critical skill refers to the lack of ability of people to perform to the level of occupational competence required because of gaps in their skills profiles, (Umhlaba Skills Services 2007: 4)

While the above definition seems clear, it is not always adhered to. There is disagreement within government about the DoL's definitions, which has led to a blurring of the difference between the two terms. Not surprisingly, the confusion makes identification and measurement of scarce and critical skills extremely difficult (Umhlaba Skills Services 2007: 3–4).

The DoL has commissioned a very large research project on scarce and critical skills. The objective of the larger project is to identify, collate, interpret and verify information on scarce and critical skills currently available within the labour market. A secondary objective is to identify future occupational employment prospects, particularly in those occupations where scarcity is suspected (Erasmus 2006). The research project has five major components, one of which comprises case studies of occupations

or occupational 'families'. A number of professions were selected as case studies. This chapter draws on research that was done on the legal profession.

What is the legal profession? The tendency is to adopt either a narrow or a broad definition. The narrow definition includes, in the private sector, attorneys and advocates, and in the public sector, prosecutors, state attorneys, state advocates, magistrates and judges. The key elements in this definition are the requirement to have a legal qualification and the ability to appear on behalf of a client (including the state) in a court or to sit in judgement in a court. The wider definition of the legal profession includes legal advisers. In the private sector, most legal advisers are employed by large corporations. In the public sector, legal advisers are employed in national government departments, especially the Department of Justice and Constitutional Development (DoJ), as well as at the provincial and municipal levels. This chapter has adopted the broad definition of the legal profession.

What do scarce and critical skills mean in the context of the legal profession? An example is probably the best way of explaining and distinguishing the terms. A 'scarce skill' in the legal profession would be a shortage of qualified attorneys in the private sector or a shortage of prosecutors in the public sector. It would be measured primarily by the number of vacancies or purported vacancies, backed by evidence of difficulty in finding qualified people to fill the positions. While identifying a scarce skill might appear to be a relatively simple exercise, in practice it can be complicated. For example, it might be that the number of qualified attorneys overall does not register as a scarce skill, but the distribution of qualified attorneys between major centres and rural areas reveals a shortage in the latter. This would be a case of relative scarcity as opposed to absolute scarcity.

A 'critical skill' is one that should form a part of the skills profile of a law professional but does not. For example, it might be that 'practice management' is an important skill for attorneys but it is not one that they acquire as part of their academic education or in their vocational training. Low levels of literacy and numeracy amongst articled clerks is another example.

While the identification and measurement of scarce skills is complicated, measuring critical skills usually requires a much more intensive investigation. One needs to do a skills audit, preferably backed by qualitative research, to put numbers on gaps in skills profiles and shortages in specialist skills. But one needs to go further than measuring the current problem areas. It is also necessary to project estimates of scarce and critical skills due to replacement demand and economic growth, as well as to factor in employment equity requirements and the effects of changing occupational requirements. This adds considerably to the complexity of the exercise.

The legal profession has not featured in the publicity that has been given to the skills crisis. Instead, it is transformation of the legal profession that has got all the press. However, as we shall see below, transformation and skills are inextricably bound up with one another in the legal profession. This raises a number of questions. Is transformation constraining the supply of skills or is it facilitating an increased supply? Alternatively, is the (short) supply of skills hampering transformation or is demand the culprit?

The chapter has four main analytical sections. In the next section the legal profession is outlined, including the requirements to enter the profession, the main occupational groupings in the profession, the organisations that regulate the profession, and the legislative framework that governs the profession. This provides one with the context within which to locate the quantitative data that are examined in the next two sections. The first of these deals with the supply of law professionals, including discussion of the various education and training bodies that are responsible for the provision of skills. This is followed by a section that presents data on the demand for law professionals. The penultimate section seeks to draw together the data presented in the previous three sections, allowing for analysis of

demand and supply data within the context of the changing professional environment. In this section an effort is made to identify scarce and critical skills. The chapter ends with a short conclusion.[1]

The legal profession and law professionals in South Africa

A profile of the contemporary legal profession

There are a range of different occupations spread across the private and public sectors of the legal profession. For many years different law degrees (that is, the BJuris (3 years), BProc (four years), BA(LLB) and BComm(LLB) (both five years)) constituted the minimum requirements for entering different occupations. This changed in 1998 with the introduction of the four-year undergraduate LLB degree (and the phasing out of the BJuris and BProc degrees). The four-year LLB is now the minimum requirement to enter most occupations in the legal profession, that is, attorney, advocate, state attorney, state advocate and regional court magistrate.[2] The minimum requirement for prosecutors and district court magistrates remains a three-year legal degree, that is, the BJuris. At present in South Africa, many incumbent and some prospective prosecutors and district magistrates will have a BJuris. But, given that these degrees are no longer being offered by universities, it is only a matter of time before the four-year LLB will be the de facto minimum requirement.

The legal profession in the private sector

A graduate can follow various routes into the different occupations in the legal profession. Most routes into the private legal profession involve compulsory vocational training and a professional examination. To practise as an attorney a person must do two years' articles of clerkship and pass the attorneys' admission examination set by the Law Society of South Africa (LSSA). To become a member of one of the Bar Councils, that is, an advocate, a person must enter a pupillage for one year and pass the examination set by the General Council of the Bar of South Africa (GCB). However, a person does not have to join a Bar Council to practise as an advocate. In such a case, the person needs only an LLB. A legal adviser in the corporate sector also does not need to do vocational training or pass a professional examination.

In recent years, some flexibility has been built into the vocational training dispensation for attorneys. Aspirant attorneys can attend the School for Legal Practice, which falls under the Legal Education and Development (LEAD) section of the LSSA. The School provides six-month vocational training courses that shorten the subsequent period of articles by one year. Alternatively, candidate attorneys can attend practical legal training courses offered by the LEAD, either on a part-time basis or in two full-time teaching blocks totalling five weeks. This will assist them with regard to the attorneys' admission examination but does not reduce the period of their articles.

Attorneys and advocates have historically had different professional organisations. Attorneys *must* belong to one of the four law societies in the country – the Cape Law Society, the Free State Law Society, the KwaZulu-Natal Law Society, and the Law Society of the Northern Provinces – all of which are members of the LSSA. The LSSA has two additional members: the Black Lawyers Association (BLA) and the National Association of Democratic Lawyers (NADEL). Attorneys are not required to belong to one of these bodies. Membership of one of the 12 Bar Councils is voluntary for advocates. The umbrella

1 The author would like to thank Professor Rob Midgley at Rhodes University and Professor Hugh Corder at the University of Cape Town for their assistance in the course of the research for this chapter as well as for their advice and comments on an earlier draft of the chapter. The usual disclaimer applies.

2 It should be noted that some students still do a BA or BComm with certain law subjects, which allows them to join the LLB in its third year, effectively giving them a BA(Law) LLB or a BComm(Law) LLB.

body for these councils is the GCB. It is not known how many advocates are practising outside the Bar Councils.

The legal profession in the public sector

In the public sector, law professionals practise as state attorneys, prosecutors or state advocates, or they become magistrates or judges. There are also state legal advisers and departmental legal advisers. Most of these occupations do not require vocational training or an admission examination. State attorneys, however, must go through the same vocational training and write the same examination as attorneys in the private sector, while a six-month Aspirant Prosecutor training programme has been introduced for new prosecutors, and entry-level district magistrates receive two months' training at the Justice College and are mentored thereafter by a senior magistrate for at least six months. Regional magistrates must have five years' applicable experience in law to be appointed.

It is somewhat anomalous that there is no legal qualification required for appointment of a judge. All that the Constitution requires is that the person must be 'appropriately qualified' and must be 'fit and proper'. For many years, however, the convention was for senior advocates to be appointed to the Bench. This convention meant that there was no need to stipulate a legal qualification. But the pressures of transformation have undermined the convention, although to date, appointments have still been from the legal profession; (for example, in the last three years about six magistrates have been appointed as judges).

A very large proportion of law professionals in the public sector fall under the DoJ, either directly or in the various independent sections, bodies and commissions that formally fall within the ambit of the DoJ. The most important components are the court system, within which magistrates and judges work, the National Prosecuting Authority (NPA), which employs most of the prosecutors and state advocates, and the Legal Aid Board (LAB), which employs a large number of articled clerks and attorneys. Other important sections are the State Attorneys Office and the Office of the Chief State Law Adviser. A sprinkling of law professionals are employed in the offices of the Master of the High Court, the secretariat of the Rules Board for Courts of Law, the Law Reform Commission, the Human Rights Commission, the Commission on Gender Equality, and the office of the Public Protector (GCIS 2007: 401–403).

Further education and training in the legal profession

The LLB provides the basis for entering the legal profession. However, it was noted above that the LEAD offers a number of vocational training courses for aspirant attorneys. The LEAD, along with a number of other organisations, also provides a great deal of further education and training for law professionals. Some examples of this training are briefly outlined below. It should be stressed that what follows is by no means an exhaustive treatment of the training organisations serving the legal profession.

About 6 000 students per year go through the LEAD's extensive range of pre- and post-admission vocational training courses. The courses that offer additional or specialist skills take various forms, ranging from taught courses, to courses offered on a distance basis, to one-off seminars. For example, attorneys have traditionally been able to acquire two further professional qualifications, that is, to practise as conveyancers and as notaries. The LEAD offers courses in Conveyancing Practice and Notarial Practice to prepare attorneys to write the relevant professional examinations. These courses are offered by way of classes and also on a distance education basis. Further courses offered through distance education are: Diploma in Labour Law; Certificate in Deceased Estates; Certificate in Income Tax; Certificate in Corporate Law Practice; and Certificate in Insolvency, Litigation and Administration.

A course in Practice Management is a particularly important part of the continuing education focus of the LEAD. The course is offered via classes, correspondence and the Internet. To date, the correspondence option has been the most popular, followed by classes. The Internet option is a more recent offering. The Attorneys Act (No. 53 of 1979) is soon to be amended to make the course mandatory for attorneys who become partners in legal practices and for those who set up their own practices. In future, such attorneys will have to have completed the course within a year of receiving their Fidelity Fund certificates.

The Attorneys Fidelity Fund, which acts to protect members of the public from losses resulting from theft of trust funds by attorneys, plays an important role in legal education and training through the provision of funding. It gives money to the LEAD for its practical legal training and continuing education programmes, to the BLA for its Legal Education Centre, and to all the universities to assist their legal aid clinics and to fund projects that could enhance the practical skills of students. It also has an extensive bursary scheme for students (Midgley 2007: 22).

The Justice College is the official training arm of the DoJ. The College delivers training to magistrates, state advocates, prosecutors, family advocates, state attorneys, legislative drafters, court interpreters, court and office support personnel as well as other legal professionals. The College is currently undergoing major restructuring and transformation. This will result in significant expansion both in terms of its training menu and its target audience. Training will be informed by needs analyses conducted with its existing 'clients', and it will be targeted towards improving performance in the workplace. New training courses will also be informed by what court officials could be facing in the near future. For example, the following are some of the new courses being introduced: Organised Crime; Cyber Crimes; Environmental Law; International Agreements; Refugee Law; Human Trafficking; Extraditions; and the National Credit Act. All courses will be accredited with the Safety and Security Sector Education and Training Authority (SASSETA) and participants will therefore earn credits that could over time lead to a qualification or a further qualification.

The Justice College is due for an even more radical restructuring. The South African Judicial Education Institute Bill proposes the establishment of a new judicial training body that will focus on judicial officers, that is, magistrates and judges. The aim is to provide appropriate and transformational judicial education and training, having due regard to the legacy of apartheid and the new constitutional dispensation. Training will be given to aspiring and newly appointed judicial officers; there will also be continued training for experienced judicial officers. All other legal professionals as well as support staff within the DoJ will continue to receive training at the Justice College.

Another important training institution is the SASSETA, whose full name is the Policing, Private Security, Justice, Legal, Correctional Services, Defence and Intelligence Sector Education and Training Authority. As is evident from its name, the SASSETA spans the private (Legal) and public (Justice) sectors of the legal profession. It must be emphasised that the SASSETA does not itself provide training. It registers learnerships and accredits training providers to deliver the relevant training.

Universities are also playing an increasingly important role in providing further education and training for law professionals. Until fairly recently, master's and PhD qualifications in law were rare. This was largely the result of the orientation of law teaching towards the practice of law. However, with greater specialisation taking place within the profession there has been rising demand for master's and PhD qualifications. The introduction of taught (coursework) master's degrees in the 1980s was a response to this demand and has in turn fuelled further demand by practitioners and others for post-LLB qualifications. These courses are open to attorneys and advocates as well as law professionals in the corporate and public sectors.

Transformation of the legal profession

Under apartheid, the Extension of University Education Act (No. 45 of 1959) restricted entry to universities on the basis of race. In order for a black (i.e. African, coloured or Indian) person to be admitted to a white university, he/she had to get a special ministerial permit certifying that no equivalent programmes were offered at black universities. A number of universities were subsequently established in the so-called 'homelands' in order to provide tertiary education there for blacks and limit the number of applications made to white universities (Iya 2000: 2).

The practice of law was, in theory, open to all race groups under apartheid. However, in reality, black attorneys faced much the same segregated system that they had confronted in qualifying at a local university. Black attorneys were restricted to practising law in townships and the 'homeland' areas. In order to practise in an 'urban' area, a black attorney had to obtain a government permit (Midgley 2007: 5).

Not surprisingly, the legal profession came to be dominated by whites, in particular, white men. Far more whites qualified and practised law, and their firms monopolised the lucrative branches of legal practice. Black practitioners for the most part had criminal law practices and in some cases were involved in human rights law. Furthermore, the judiciary was overwhelmingly white, as were the prosecutors and magistrates in the lower courts. It was only in the 'homelands' that most prosecutors and magistrates were black and male (Midgley 2007: 5).

The transformation of the legal profession was therefore a key issue after the 1994 elections. The DoJ was at the forefront of the transformation process. In 1995, the DoJ's newly-formed Planning Unit published *Justice Vision 2000*, a strategic plan for transformation of the justice system. In the section dealing with the legal profession, *Justice Vision 2000* called on the profession to remove 'the constraints that make access to the profession unduly difficult, and sometimes impossible', and to improve 'professional training programmes and strengthen the capacity of existing training institutions'. The document also noted that access to lawyers was made difficult by the 'concentration of lawyers in urban centres' which left 'rural communities with very few professional legal services' (Ministry of Justice 1995: 108–109).

These comments represent an intervention in a debate that had started in the early 1990s regarding the existing legal degrees and the compulsory vocational training requirements of the legal profession. One argument in the debate was for the various legal degrees to be consolidated into a single, uniform entry qualification for all legal practitioners that would place greater emphasis on practical skills. Another position, held by many black lawyers, was that the traditional five-year qualification and professional examinations were barriers that had been erected to restrict entry to the legal profession by blacks. They wanted a single four-year undergraduate university qualification with a strong practical component, and also demanded the scrapping of compulsory vocational training and professional examinations. A third view was pushed by education experts, who argued that universities needed to align their teaching with the country's needs. The implication for legal education was that curricula should place greater emphasis on practical skills.

The outcome of the debate was a compromise. It was agreed to introduce a four-year undergraduate LLB degree as the entry qualification for all legal practitioners. Thereafter, the necessary amendments were made to the relevant statutes by the Qualification of Legal Practitioners Amendment Act (No. 78 of 1997), and the new degree was offered for the first time in 1998 (and the BJuris and BProc degrees were phased out). But a single, generic LLB curriculum was rejected and each university continued to determine its own curriculum, with varying provision of practical skills training to students. And there

was no change to the compulsory vocational training requirements of the profession or the need to write professional examinations.

A 1999 discussion document that followed *Justice Vision 2000* saw a shift in emphasis. Its concern was with the lack of uniformity with regard to, amongst other things, vocational training and admission examinations, rather than with these requirements per se. The document identified 'anomalous differences in the way in which and rules according to which the various branches of the profession are regulated'. These included the difference in the period of articles of clerkship and pupillages; that attorneys had to pass an admission examination, while advocates needed to write the Bar examination only if they wanted to practise at one of the Bar Councils; the fact that it was compulsory for attorneys to join a Law Society, whereas membership of a Bar Council was voluntary; that attorneys could appear in the High Court only after applying to the Registrar of the High Court for right of appearance; and that corporate legal advisers were not required to do any practical vocational training or pass any admission examinations (DoJ 1999: 1–3)

While acknowledging that some changes had taken place – the lengthening of the period of the pupillage and the reduction of the period of articles for a person who attended the School for Legal Practice – the discussion document proposed that further efforts needed to be made to introduce uniform requirements with respect to the period of vocational training, which it stated should be a minimum of one year. It also proposed that all aspirant legal practitioners be required to do a period of community service, suggesting that such service could entirely replace the vocational training but had to be at least six months, that is, with the remaining six months comprising vocational training (either articles or pupillage) or attendance at an accredited vocational training course offered by a university or professional organisation (DoJ 1999: 5, 12).

The discussion document indicated that there was a deadlock over the issue of admission examinations. The profession wanted to continue to administer its own examinations, while organisations representing black lawyers insisted that the examinations be dropped altogether. The options, according to the discussion document, were for a statutory body to set the examinations, thereby ensuring that they tested a minimum standard of proficiency rather than being set at a level that prevented entry to the profession by aspirant practitioners, or for there to be no admission examination, in which case a statutory body would need to be established to ensure that the LLB degrees offered by the various universities met a minimum standard (DoJ 1999: 5–6).

The discussion document noted that law graduates were becoming increasingly diverse. However, many graduates from previously disadvantaged groups or from historically black universities struggled to gain access to the profession. This problem would need to be addressed if the profession was to transform into one that 'represents the diversity of South African society in all branches and at all levels'. It was also noted that there was still a very uneven distribution of lawyers between urban and rural areas. However, the proposed recognition of paralegal practitioners, many of whom are based in the rural areas, would also play a part in addressing some of the consequences of this problem (DoJ 1999: 9–11).

The next step in the transformation process was the development of a legal services charter. The 3rd Draft Legal Services Charter (October 2007) represents a concerted attempt to take the transformation process forward. Under the heading 'Access to the Legal Profession', the Charter identifies as challenges 'the shortage of legal practitioners and the cost of legal services in South Africa as a result of barriers to entry into the profession'; ensuring that the legal profession is representative in terms of

race and gender so that there is a body of well-trained and competent legal professionals to enable appointments to be made to the judiciary that reflect the demographics of South Africa; and 'to ensure that legal training and education includes social context awareness training' (DoJ 2007b: 16).

A separate chapter deals with 'A Transformed and Unified Legal Profession'. In this chapter the relevant professional bodies commit themselves to 'transform the regulatory regime of the profession'. However, very few details are given as to how this will be done and what the new regulatory regime will look like. This is left to the envisaged Legal Practice Act, which was published as an incomplete discussion document (the Legal Practice Bill) in 2000.[3]

The Legal Practice Bill is concerned with critical issues such as the unification of the legal profession; standards of education and training; qualification criteria for admission to the profession; licence to practice; discipline in respect of unprofessional conduct and misconduct; public indemnity in respect of negligence by practitioners; and a fidelity fund for the legal profession. The key vehicle for achieving the above will be the South African Legal Practice Council, which will regulate the practice of law; maintain standards of professional practice and ethical conduct; promote high standards of legal education and training; and promote access to the legal profession (Draft Legal Practice Bill 2000: 5–6).

The Bill proposes formally expanding the scope of the profession in two ways. First, all legal practitioners employed by corporations (other than a legal practice), or by the state, or by non-governmental organisations, who provide legal services only to their employers, can apply to be placed on the roll of legal practitioners. Thereafter, they would be entitled to appear in court on behalf of their employers. This would bring into the profession the large body of people in the private and public sectors who act as legal advisers. Second, paralegal practitioners may apply for registration. Although they would not be enrolled as legal practitioners, they would become a formal adjunct to the profession (Draft Legal Practice Bill 2000: 9).

The Bill proposes to make the vocational training period of *all* aspirant legal practitioners one year. This will replace the current minimum period of two years for articled clerks and the one-year pupillage for aspirant advocates. The vocational training can be done at a legal practice, in the public sector (for example, supervised by a judge, a magistrate, or a prosecutor), or at a practical training institute. Furthermore, the Bill proposes that admission examinations be replaced by a more flexible form of evaluation of the skills acquired during the course of practical vocational training (Draft Legal Practice Bill 2000: 1, 10–11).

The future shape of the legal profession

The legal profession will in future be characterised by more uniformity and greater statutory regulation. The latter will manifest in the establishment of a single statutory regulatory body for legal practitioners. Increased uniformity, which began with the introduction of the four-year LLB, will continue with the removal of any formal distinction between advocates and attorneys, and with the inclusion of legal advisers on the roll of legal practitioners (the latter will become the name for attorneys, advocates and legal advisers). It is likely, however, that a division will remain between attorneys and advocates, based on specialisation and expertise.

Uniformity will also extend to the period and content of articles and pupillages. It is likely that a common form of compulsory vocational training of a year's duration will be introduced for aspirant attorneys and advocates, with community service making up a significant proportion of the training.

3 There are apparently a number of versions of this Bill doing the rounds. The version referred to in this chapter is the one published in August 2000 and accessed at http://www.info.gov.za/bills/2000draftlpb.htm.

Furthermore, vocational training will be allowed at a much wider range of institutions and organisations, which will make entry to the profession easier and should also improve the geographical spread of legal skills. However, it is unclear what will happen to the attorneys' admission examination and the Bar examination. Logically, a common form of vocational training means a single examination, but at this point it is unclear what form of evaluation will be used in future, given the intention to introduce a more flexible test of competence.

In the public sector, a number of positions require only a three-year legal qualification. But as BJuris and BProc degrees phase out of the system, the four-year LLB will mean greater uniformity within the public sector as well as between the public and private sectors of the legal profession, which will be entrenched by including law professionals in the public sector on the roll of legal practitioners.

In terms of supply, the major impact of the above changes will be at the post-university stage of the pipeline. Shorter vocational training, particularly if it can take a variety of forms and can be performed at a wider range of institutions, is likely to lead to more graduates entering the profession. Introducing a different form of evaluation to replace the admission and Bar examinations will also facilitate entry. So the numbers coming into the profession will rise, but a question mark remains as to whether new attorneys and advocates can establish themselves (and stay) in the profession. Bearing this in mind, the next section examines data on current supply to the legal profession.

The supply of skilled law professionals

As indicated above, a person must meet three requirements before they can enter the practising legal profession in the private sector. First, they need to have at least the undergraduate LLB degree. Second, they need to have completed a period of vocational training, either articles of clerkship or a pupillage (although the latter is necessary only if they wish to join one of the Bar Councils). The period of articles can vary, depending on whether the person has attended the School for Legal Practice run by the LEAD; that is, doing so will reduce the period of the articles. Third, prospective attorneys have to pass the attorneys' examination and prospective advocates who wish to become a member of one of the Bar councils must pass a Bar examination. In this section, we examine quantitative data in respect of the various stages of the pipeline that supplies the attorneys' and advocates' professions.

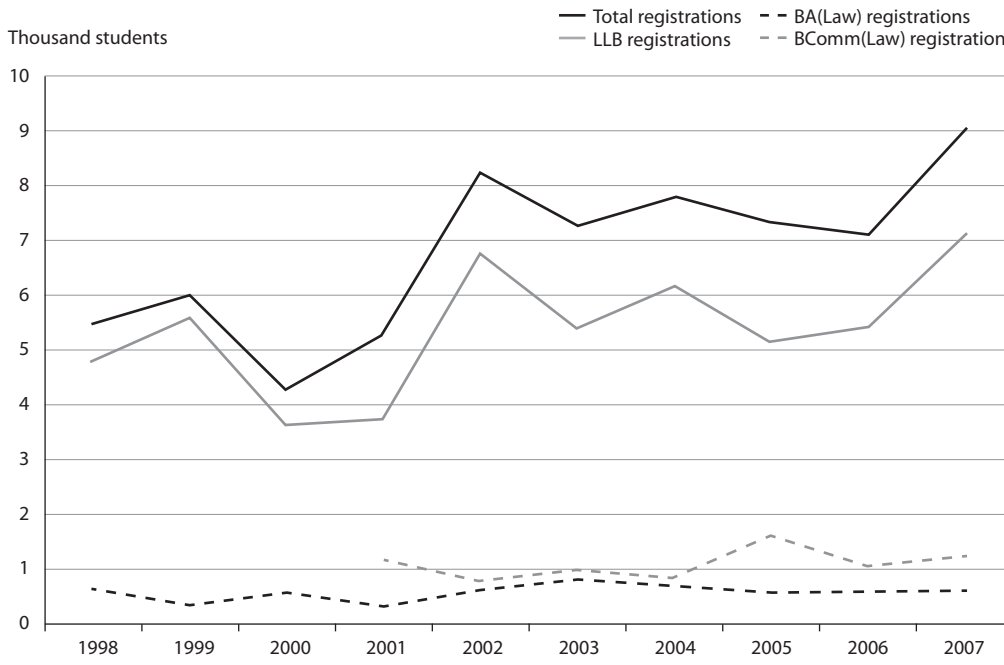
A quantitative analysis of the supply of law professionals

In the period 1998–2007, the total number of first-time, first-year registrations for the LLB, BA (Law) and BComm (Law) degrees fluctuated between about 5 500 and 9 000, although the fluctuations were around a steadily rising trend. This is displayed in Figure 8.1.[4]

The figure shows that the vast majority of registrations were for the LLB degree. Registrations for this degree followed a very similar pattern to the total number of registrations, fluctuating between about 5 000 and 7 000, and also ending sharply up. This indicates the growing popularity of the degree. Registrations for the BA(Law) and BComm(Law) degrees remained at about the same level over the period.

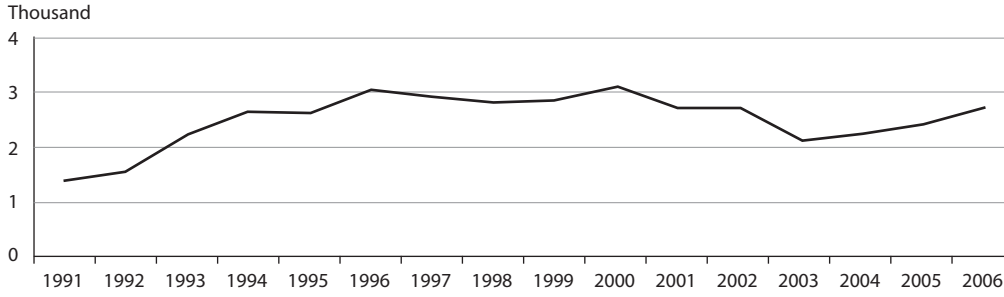
4 Many of the figures in this chapter are based on data supplied by the LEAD. They were compiled from the following reports:
Law Society of South Africa Training for Practice. Statistics 13 August 2001. Compiled by Dianne Angelopulo.
Legal Education and Development. Lifelong learning towards a just society. National Liaison Committee Meeting 14 July 2003. Compiled by Dianne Angelopulo.
Law Society of South Africa. Legal Education and Development. Attendance Figures, Statistics, Attorneys and Contracts of Articles, May 2007. Compiled by Dianne Angelopulo.

FIGURE 8.1: *First-time first-year registrations for a law degree, 1998–2007*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.2: *LLB graduates, 1991–2006*

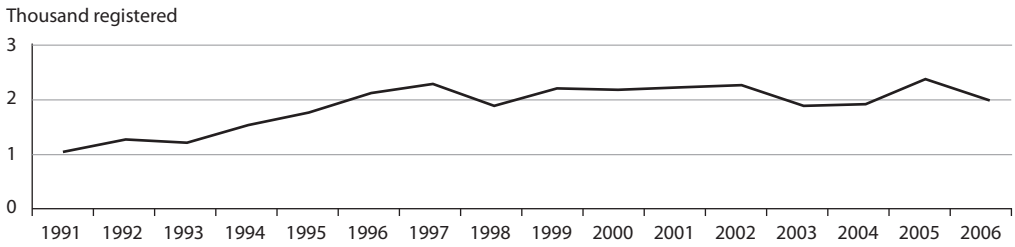


Source: Data supplied by the LEAD (see Footnote 4)

Figure 8.2 presents data for LLB graduates for the years 1991–2006. There is a strong rising trend in graduations until 2000 and then a quite steep decline to 2003, which is probably the result of the phasing out of the BProc degree in 2002. Thereafter, the number of graduations increases steadily to 2006, which confirms the growing popularity of the four-year LLB degree displayed in Figure 8.1.

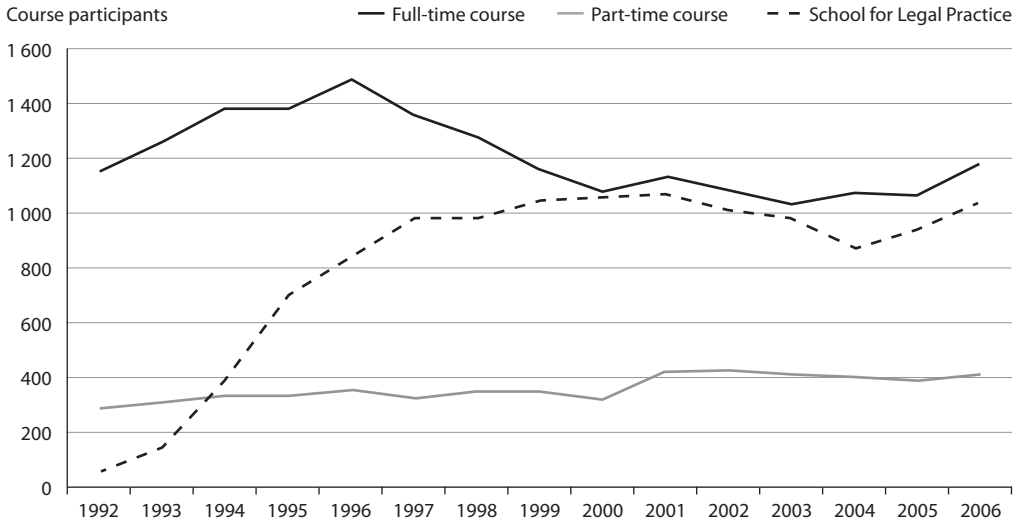
In Figure 8.3, data are presented on the number of articles of clerkship registered with the various law societies in the country for the period 1991–2006. The figure shows that there is a steeply rising trend in registrations from 1991 to 2002, albeit with some fluctuations. The decline after 2002 is probably the

FIGURE 8.3: *Articles registered, 1991–2006*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.4: *Attendance at the School for Legal Practice and practical legal training courses, 1992–2006*



Source: Data supplied by the LEAD (see Footnote 4)

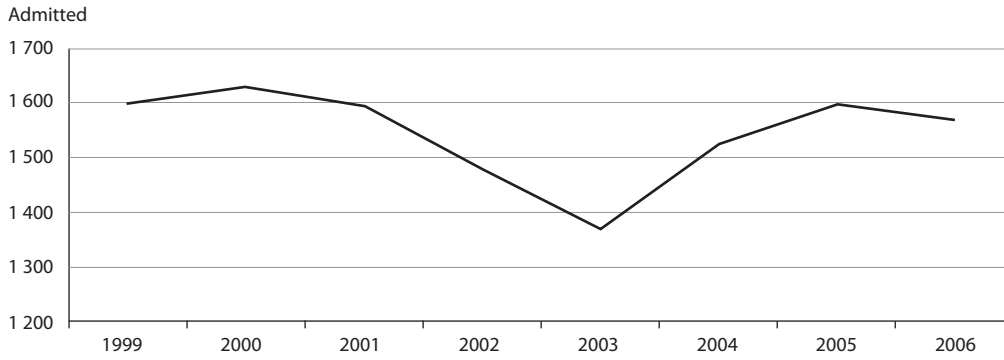
result of the phasing out of the BProc. However, in most years after 1996 more than 2 000 registrations per year take place.

Figure 8.4 deals with registrations for the School for Legal Practice and the full-time and part-time practical legal training courses. The figure reveals that the full-time course is the most popular option for articled clerks, although attendance on the course declines after 1996. Attendance at the School for Legal Practice increases hugely from 1992 to 2000, then reaches a plateau before rising again from 2004. The part-time course is the least popular, but attendance on the course increases steadily over the period.

Figure 8.5 presents data in respect of the number of attorneys admitted in the period 1999–2006. The figure reveals a steep decline in admissions after 2001. As noted with regard to a similar trend in earlier figures, this probably reflects the effect of the phasing out of the BProc degree. The decline lasts until 2003, after which there is a sharp increase in admissions to 2005, before a dip in 2006.

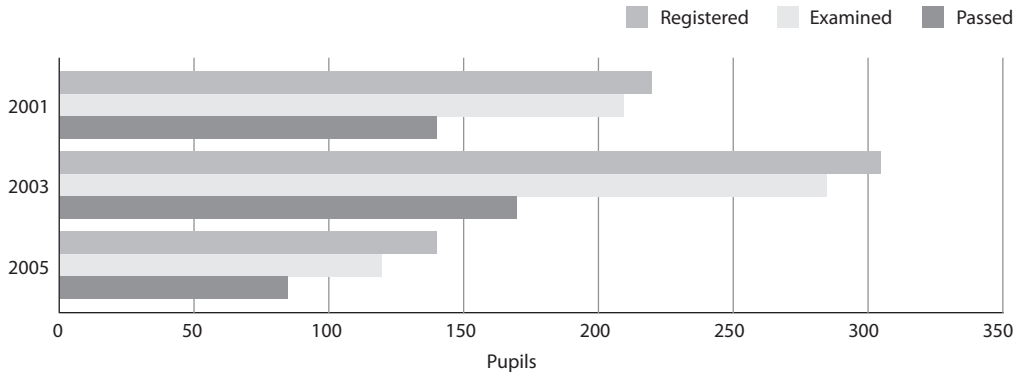
The discussion above has dealt with the supply-line through to becoming an attorney. The alternative for some LLB graduates is to practise as an advocate. Aspirant advocates who want to join one

FIGURE 8.5: *Attorneys admitted, 1999–2006*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.6: *Throughput in the pupillage system, 2001, 2003 and 2005*



Source: Data supplied by the GCB

of the Bar Councils must do a pupillage of one year and pass a Bar examination (whereas those who do not want to join one of the Bar Councils can begin to practise immediately after being admitted as advocates).

In Figure 8.6, which is based on data compiled by the Secretariat of the GCB, Johannesburg, we show the number of pupils registered, the number sitting the Bar examination, and how many passed the examination. It should be noted that until 2004, the length of the pupillage was six months and there were two intakes of pupils per year. From 2004, the period of the pupillage was increased to one year and there was only one intake each year. This accounts for the sharp drop in the number of pupils in 2005.

The figure shows that most pupils complete their pupillage and sit the examination, but the lowest bar for each year indicates that the failure rate is high. It is also evident that the increased length of the pupillage has had a small negative impact on the number of pupils who completed their pupillage and sat the examination (down to 88 per cent in 2005 from 95 per cent in 2001 and 93 per cent in 2003). Surprisingly, however, the longer pupillage has not impacted positively on the pass rate. This drops from 63 per cent in 2001, to 57 per cent in 2003, and to 56 per cent in 2005.

The demand for law professionals

A quantitative analysis of the employment of law professionals

Data derived from the October Household Survey (OHS) (Stats SA 1996–1999) and the Labour Force Survey (LFS) (Stats SA 2000–2005) show that the vast majority of law professionals are employed in the finance and community services sectors. Figure 8.7 shows that there are very few law professionals in the other sectors of the economy.

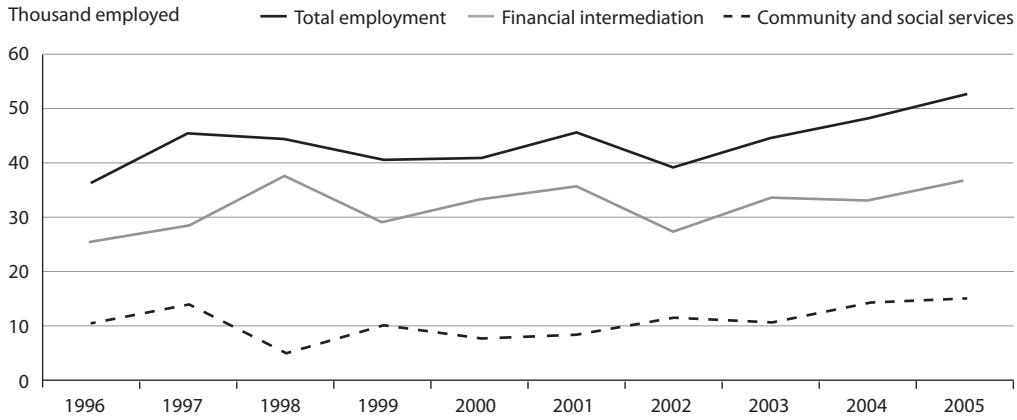
The finance sector is by far the biggest employer of law professionals. Growth in this sector largely accounts for overall growth in law professionals. Figure 8.7 also shows that growth in the employment of law professionals has been moderate, although from 2002 there is a quite strong upward trend. This has probably been driven by the sustained period of economic growth in the country.

The SASSETA Sector Skills Plan indirectly confirms the rise in the number of legal professionals. It states that in the period 1997–2002 there was an increase of 1 850 legal firms (44.5 per cent), which implies an even larger increase in the number of law professionals. It is interesting to note, given the concern at the distribution of law professionals between urban and rural areas, that the majority of legal firms are located in Gauteng (62 per cent), and that much of the growth in the number of legal firms was in Gauteng, KwaZulu-Natal and the Western Cape, that is, the provinces with the major metropolitan areas (SASSETA 2005–2006: 13–14).

The LEAD provides actual numbers of practising attorneys for the years 1999–2007. These data are displayed in Figure 8.8. Growth in the number of attorneys is significant: over the eight-year period about 5 000 attorneys joined the profession. Given that there were fewer than 13 000 attorneys in 1999, this is a major increase.

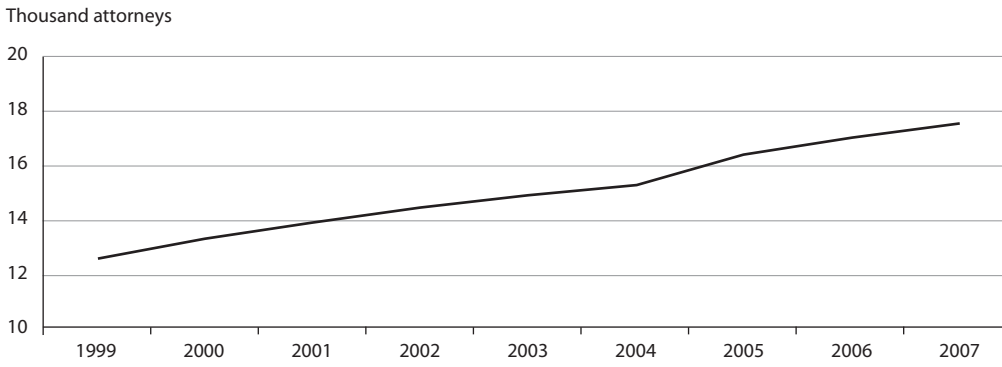
Data from the GCB provide actual numbers of advocates practising as members of one of the Bar Councils (there are no data available for advocates practising outside the Bar Councils). Figure 8.9, which is based on data drawn from reports by the Chairman to the GCB at its Annual General Meetings of 1997, 2000 and 2006, shows a steady increase in the number of advocates practising at the Bar

FIGURE 8.7: *Employment of law professionals, by main sector, 1996–2005*



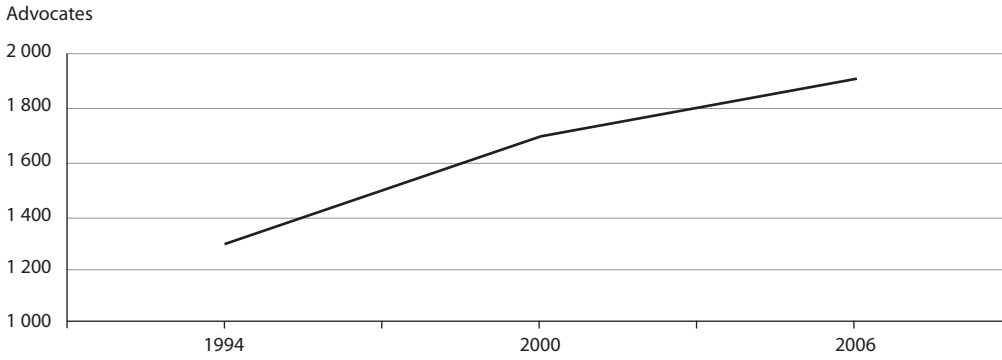
Source: Stats SA 1996–1999; 2000–2005

FIGURE 8.8: *Practising attorneys, 1999–2007*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.9: *Total advocates at Bar Councils, 1994, 2000 and 2006*



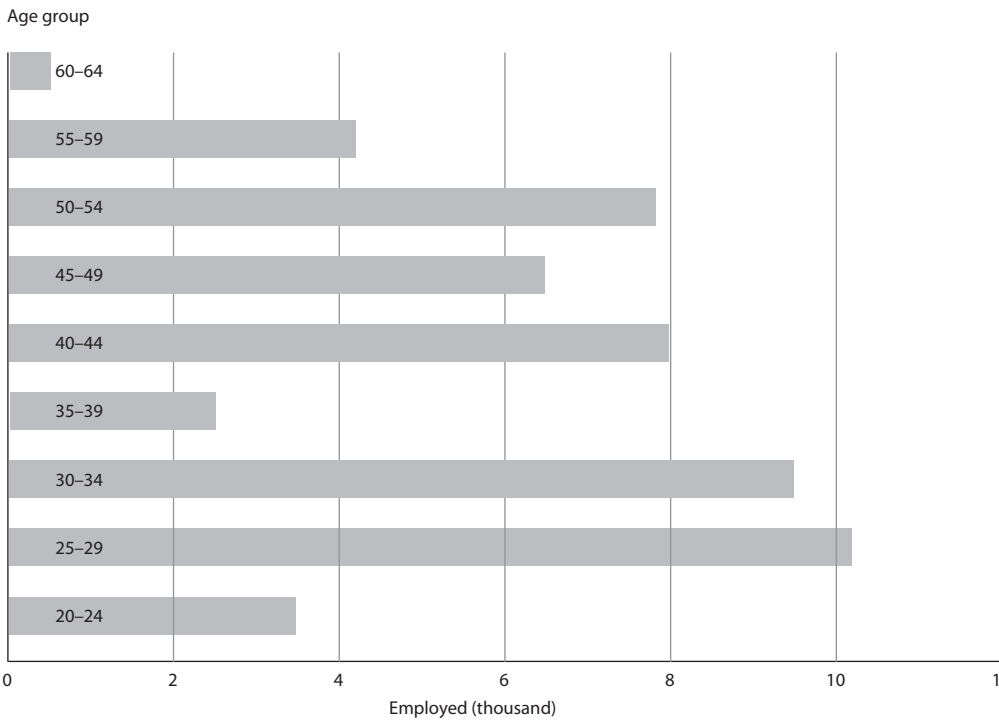
Source: Data supplied by the GCB

Councils. Note that this increase takes into account advocates leaving the Bar Councils. More recently, as Figure 8.9 shows, the rate of increase of advocates at the Bar Councils has declined slightly.

The data give an indication of strong growth in the employment of law professionals, albeit off quite low bases. In most cases, this growth trend becomes steeper over the past year or two. If the economy continues to grow at current rates the demand for law professionals will probably increase further.

There is a further factor that is important in analysing the demand for law professionals, namely, the age profile of the profession. In Figure 8.10, numbers of law professionals are presented in terms of age categories. The figure shows that there are a large number of law professionals in the 25–34-year age categories. This suggests that there is a healthy demand for qualified law professionals coming into the profession and that the profession is willing to employ young graduates with limited experience. There is a sharp drop in numbers in the 35–39 age category for which it is difficult to account. However, thereafter the size categories decline smoothly and as one would expect. The overall impression gained from the figure is that there are more than adequate supplies of law professionals to replace those retiring from the profession.

FIGURE 8.10: *Employment of law professionals, by age, 2005*



Source: Stats SA 1996–1999; 2000–2005

The data for the legal profession in the public sector are not broken down in a way that allows for detailed analysis by specific occupational category within the overall legal professional category. However, the data show that the DoJ has expanded significantly over the last few years and it appears that it is set to continue growing. At the end of March 2002, the DoJ had a staff of 11 066. Data were not provided for the number of professionals, but there were 1 669 magistrates and 73 state law advisers (DoJ 2002: 11–12). By 2006/07, the staff of the DoJ had increased to 16 879 (an increase of 52 per cent over 5 years). About one-fifth of the staff was categorised as professional, including 1 826 magistrates, 205 judges, 198 attorneys, 67 advocates and 5 prosecutors (note that state advocates and prosecutors fall under the NPA and are not included in the above; the advocates referred to above are probably, in the main, family advocates and legal advisers, while it is unclear where the prosecutors are employed). The numbers in almost every one of these categories had increased over the previous year, with the exception of judges and prosecutors. Projections for most of the professional categories show that further increases are in the pipeline. The DoJ did not anticipate any difficulties in filling new positions (DoJ 2007a: 235, 238–239, 249; SASSETA 2005–2006: 5, 9–10, 74).

Data on vacancies confirm the growing demand for law professionals, but are particularly useful in shedding light on the expansion of employment in the public sector. Drawing on a database maintained by the Department of Labour (DoL 2007) that records advertisements in the *Sunday Times* for law professionals (Erasmus 2008), we are able to examine advertisements for law professionals for the period April 2004–March 2007 (categorised according to the Organising Framework for Occupations).

The data show that the vast majority of advertisements are for positions in the public sector. Across the 3 years, there were 470 advertised positions (15 per cent of the total) in the private sector as against 2 596 (85 per cent) in the public sector. This is to be expected. The nature of the main branches of the legal profession in the private sector is such that people are seldom recruited via advertisements in newspapers. When one breaks down the advertisements, one finds that most were for advocates, followed by 'judicial and other legal professionals'. The former must refer to state advocates, while the latter refers to judges and magistrates as well as registrars and legal researchers. Significantly, the number of advertisements for advocates increased enormously over the period, which reflects the drive by the DoJ and other government departments to recruit law professionals. We shall examine this drive further below with respect to vacancies and recruitment at the DoJ.

One of the most interesting aspects of the advertisements is that the majority did not stipulate a great deal of experience as a requirement (Table 8.1). This mirrors the picture in Figure 8.10, which shows that a large proportion of law professionals are young, and confirms the suggestion that there is strong demand for young and relatively inexperienced law professionals.

The number of advertisements for positions in the public sector corresponds to the steady whittling down of the number of vacancies reported by the DoJ. Since 2004, the DoJ has filled vacancies across all occupational categories, with the exception of judges (Table 8.2). The latter is partly explained by the doubling of the number of approved judge posts, with the result that there is a very high vacancy rate (SASSETA 2005–2006: 32). Professional occupations that are still experiencing relatively high vacancy rates are listed in Table 8.2 (note that this does not include vacancies in the NPA).

Table 8.2 does not necessarily reflect the extent of expansion planned by the DoJ because the table shows current vacancies only. Further expansion could see the creation of new posts, which would require additional recruits. In the meantime, the DoJ appears to be moving quite quickly to fill the vacancies. For example, at the time of writing this chapter, all the vacancies for senior magistrates had been advertised and the process was under way to select people to fill the positions. Another advertisement was about to be placed for entry-level magistrates. This would eliminate all the vacancies for magistrates.

Scarce and critical skills in the legal profession

In this section, we shall sum up the data in respect of the supply of and demand for law professionals. We will then analyse the data in respect of race and gender. Thereafter, we shall draw on other sources to identify a number of key issues regarding skills in the legal profession.

Investigating absolute scarcity in the legal profession

There is a healthy supply of law professionals emerging through the university and vocational training pipeline. There are some fluctuations but these are probably accounted for by the discontinuation of the BProc degree when the switch was made to the four-year LLB. However, the negative impact of the changeover lasts only about three to four years, after which the data reveal an upturn at almost every point in the pipeline.

The four-year LLB has proved popular and the number of registrations has risen over the past 10 years. But there is a high dropout rate between registration and graduation. This is shown in Figure 8.11, in which an attempt is made to establish what proportion of first-year students who register for an LLB will enter practice as an attorney. It must be stressed that this is a very rough exercise. Students may take more than four years to complete their degrees, while others will go to the School for Legal

TABLE 8.1: *Experience required in advertisements for law professionals, 2004–2007*

Years of experience required	Number of advertisements
Up to 3 years	457
Up to 5 years	202
Up to 10 years	80
More than 10 years	6

Source: Erasmus 2008

TABLE 8.2: *Professional occupations in the Department of Justice with high vacancy rates, 2006–2007*

Occupation	Number of posts	Posts filled	Vacancy rate (%)
Judges	1 012	205	80
Magistrates	2 088	1 826	13
Advocates	80	67	16
Attorneys	339	198	42

Source: DoJ 2007a: 238–239

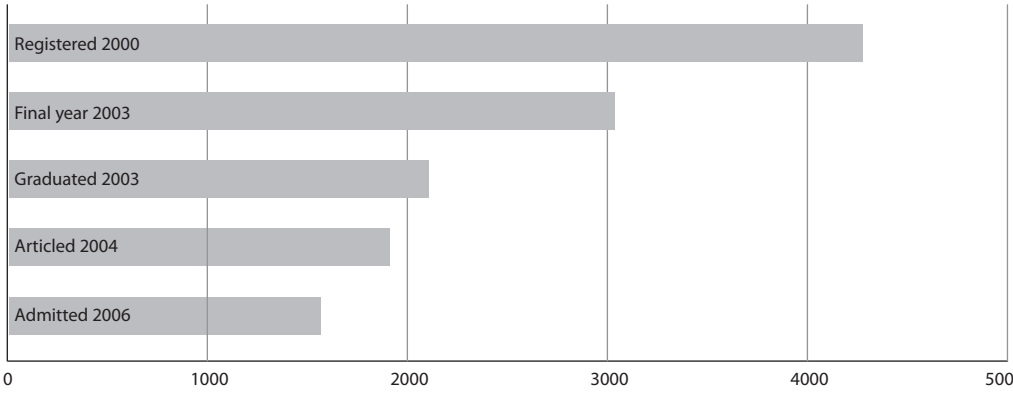
Practice before entering articles. These and other factors would influence the proportions presented in the figure. However, it does provide some indication of the throughput in the supply pipeline into the attorneys' profession.

The top bar represents all those students that registered for the first year of an LLB for the first time in 2000. The next bar shows all students enrolled in their final year in 2003; that is, this is the proportion (71 per cent) of first-year students in 2000 who had reached their final year in 2003. The next bar shows the number of those students who graduated in 2003. This is almost half (49 per cent) of the number of first-year registrations in 2000. The next bar shows the number of articles of clerkship registered in the year following graduation; this is 45 per cent of the first-year students in the top bar. If these students did their two years of articles and passed their admission examination they would be admitted to practise in 2006, which is represented in the lowest bar. The figure indicates that a little over a third (37 per cent) of the students registering for their first year of an LLB will end up practising as an attorney.

What Figure 8.11 suggests is that most of the people who leave the pipeline that runs from universities through to the attorneys' profession do so in the course of their university studies (51 per cent). Once they have completed their LLB degree, the vast majority of graduates register for articles (91 per cent) and thereafter become admitted as attorneys (82 per cent). The four-year LLB degree therefore still appears to be a problem for many students who might wish to become attorneys, while articles and the attorneys' admission examination seem to be less of an obstacle. The latter is probably a tribute to the training provided by the LEAD.

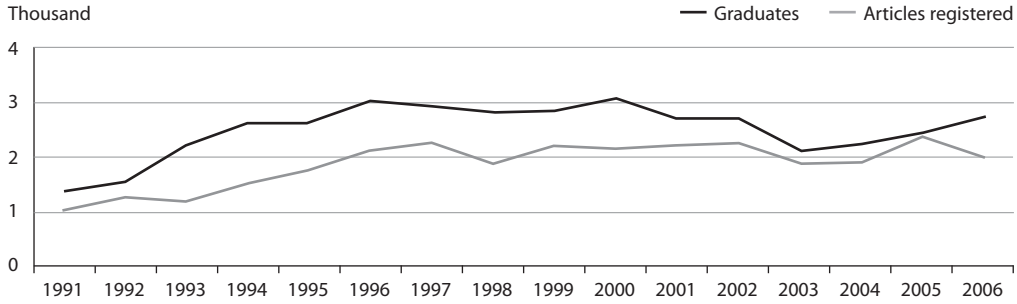
Despite the high dropout and failure rate, the number of LLB graduates has been rising, which has resulted in a quite steep increase in the registration of articles of clerkship over the past 15 years. This indicates a healthy demand for articled clerks. The question is whether supply and demand are aligned. There is anecdotal evidence that there is a shortage of demand for articled clerks, which leads to many

FIGURE 8.11: *The Class of 2000 – from registration to admission*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.12: *LLB graduates and articles registered, 1991–2006*



Source: Data supplied by the LEAD (see Footnote 4)

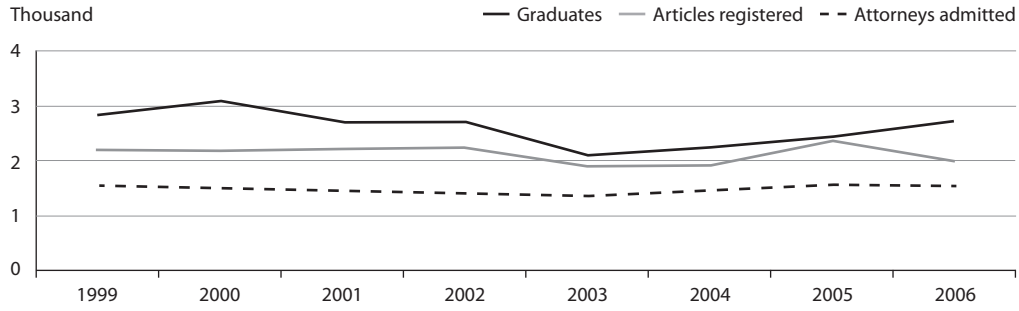
graduates who are not able to get articles going to the School for Legal Practice. However, the growing number of articled clerks tends to discount this evidence.

In Figure 8.12, we compare the number of LLB graduations in the years 1991–2006 with the number of articled clerks registered in those years. Ideally the data for articles should be staggered by a year, but the figure provides a clear indication of relative proportions.

The figure shows that the number of articles registered tracks the number of graduates quite closely, but from about 1999, the gap narrows significantly, which is an indication that the number of positions being taken up is increasing relative to graduates. One explanation for this is the employment of very large numbers of candidate attorneys by the Legal Aid Board. Given that some graduates will seek to practise as advocates or go directly into the public or commercial sectors, the narrowing gap tends to contradict the perception that articles of clerkship are in short supply, forcing many graduates to enter the School for Legal Practice before they obtain articles. It might be that the perception has arisen because graduates are not able to get articles at the premier law firms (that pay much better) and are reluctant to take up articles at smaller firms or the Legal Aid Board.

There is a gap between the number of articled clerks registered and the admission of attorneys. As noted above, the registration of articled clerks increases across the period 1991–2006, albeit with

FIGURE 8.13: *LLB graduates, articles registered and attorneys admitted, 1999–2006*



Source: Data supplied by the LEAD (see Footnote 4)

fluctuations. Over the period 1995–2006, the number of registrations stays well above 2 000 per year for most years. However, over much the same period, the number of attorneys admitted hovers around 1 600 per year, except for a drop between 2001 and 2003. This is shown in Figure 8.13.

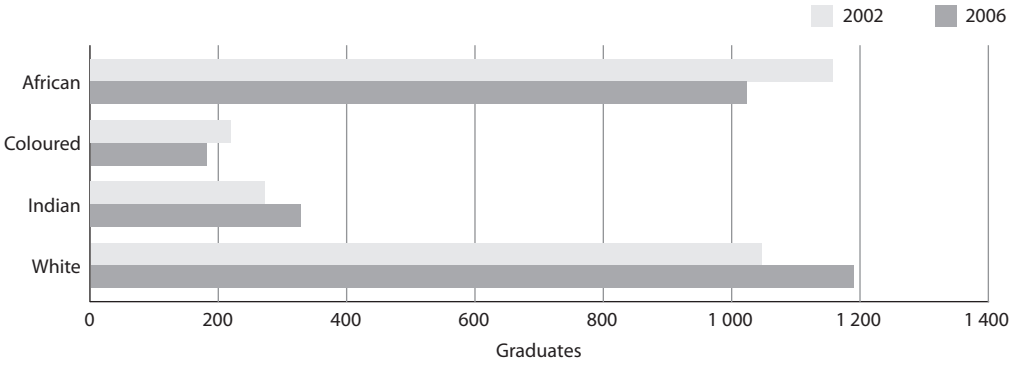
Over the period, about 500 articled clerks per year do not proceed to be admitted as attorneys. On the face of it this suggests a significant misalignment of supply of aspirant attorneys and the demand for admitted attorneys. However, there might be a number of other explanations related to the supply side. Some articled clerks might fail the admission examination and leave the profession, while others might leave the profession in the course of their articles. Others might leave after passing their admission examination and completing their articles and some might decide to practise as advocates and move over to a pupillage or go across to the public sector.

Figure 8.13 shows that the demand for attorneys is increasing steadily, although perhaps not as rapidly as the supply of articled clerks. But, given the supply-side factors sketched above, the gap between supply and demand is likely to be less than 500 per year. This means that there is demand for attorneys in the private sector, but it is probably on the weak side.

The position of advocates is somewhat different because they work for their own account rather than being employed. Demand therefore emanates directly from the amount of work there is available for advocates. We noted above that numbers of LLB graduates have increased, albeit with fluctuations, which means that the supply to the advocates profession should have increased. However, there has been a sharp drop in the number of prospective advocates because the period of the pupillage increased in 2004 and the number of intakes was reduced. Furthermore, there was also a decline in the number of pupils who completed their pupillage and a slight drop in the number of pupils who passed the Bar examination.

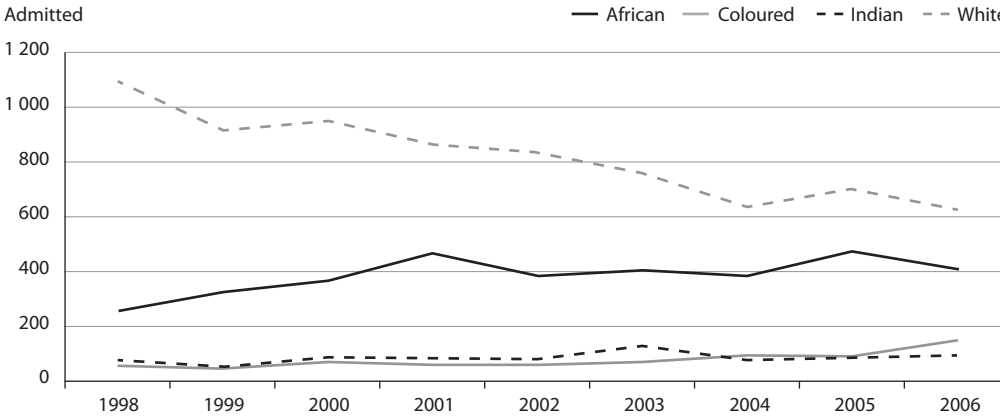
While there has been a decline on the supply side of the advocates profession, the number of practising advocates has increased steadily over the period 1994–2006 (see Figure 8.9). However, this increase (roughly 30 advocates per year) is well below the supply, even the reduced supply after 2004. This suggests that many pupils either do not practise as advocates once having completed their pupillages or are unable to sustain a viable practice. But it must be noted that the above data refer only to those advocates who are members of one of the Bar Councils. It is conceivable that some pupils and advocates leave the Bar Councils and practise as advocates on the 'outside' (what one interviewee referred to as 'the rebel Bar'). It is therefore difficult to come to a definite conclusion about the alignment of supply and demand for the advocates profession, although the data suggest that supply is exceeding demand.

FIGURE 8.14: *LLB graduates, by race, 2002–2006*



Source: Data supplied by the LEAD (see Footnote 4)

FIGURE 8.15: *Attorneys admitted, by race, 1998–2006*



Source: Data supplied by the LEAD (see Footnote 4)

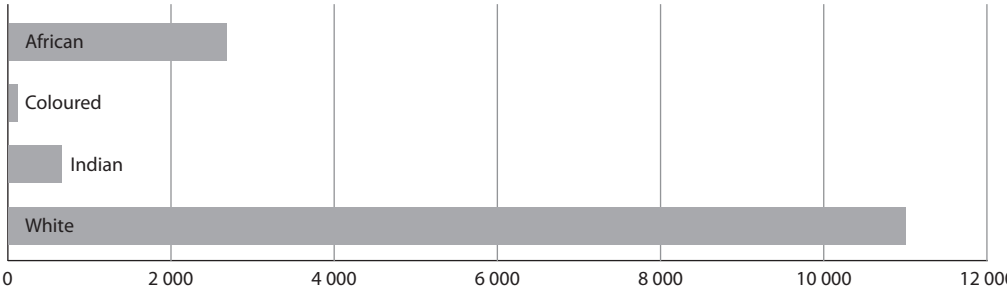
The discussion above has focused narrowly on supply of and demand for attorneys and advocates. The demand emanating from the public sector should also be factored in. The expansion of the DoJ, particularly the NPA and the Legal Aid Board, has considerably increased demand for law professionals. Interviews indicate, however, that there is an adequate supply of graduates to meet this demand.

Race and the supply of and demand for law professionals

Given that there appears to be an adequate supply of skills to the profession, both at the entry level and in terms of continuing and specialist education and training, has transformation had an impact on the labour market for law professionals? This question is examined below, with a focus on African law professionals. Unfortunately, not all of the time series data we obtained are broken down by race, which makes it difficult to compare trends to the extent done above. However, the data do give some useful pointers.

First-year LLB registrations of Africans increased significantly over the period 2003–2007. The increase was matched by a quite steep rise in the number of final-year enrolments. However, the number of

FIGURE 8.16: *Number of practising attorneys, by race, 2007*



Source: Data supplied by the LEAD (see Footnote 4)

African LLB graduates declined between 2002 and 2006, while the numbers of white and Indian graduates increased (see Figure 8.14).

We noted above that there is a significant dropout rate between registration for an LLB and graduation. African students contribute a lot to the number of dropouts. There were 3 178 first-time first-year registrations of African students in 2003 and 1 027 African graduates 4 years later in 2006. This represents a dropout rate of 68 per cent, which is considerably higher than the overall rate of 51 per cent calculated above (albeit for a different period).

Unfortunately, we are not able to extend the above exercise to include the registration of articles or the admission of attorneys, because the KwaZulu-Natal Law Society did not supply data to the LEAD on articles and admissions by race. We also do not have time series data for the registration of articles by race. However, data for 2006 (although with data for Kwa-Zulu-Natal missing) show that the registration of African articled clerks is well below that of white articled clerks. On the other hand, Africans are by far the biggest group attending the School for Legal Practice over the period 1999–2006, and there is also a steady increase in the number of African attorneys admitted over the period 1998–2006, while the number of whites declines steeply (see Figure 8.15).

It is unclear why there is such a steep decline in the number of whites being admitted as attorneys, given that the number of white LLB graduates is increasing and the number of white articled clerks is high. On the other hand, the number of African graduates is decreasing and the number of African articled clerks is relatively low, but the number of Africans admitted as attorneys is increasing. One explanation that more or less fits the data is that African graduates are successfully using the School for Legal Practice to ensure a rising pass rate in the attorneys' admission examination. But, whatever the explanation, the figure indicates that the composition of the supply of attorneys is changing.

However, the rising number of Africans being admitted as attorneys has made little impact on the composition of the attorneys' profession. Figure 8.16 shows that the vast majority of practising attorneys are white.

The question is whether the problem lies with weak demand for African attorneys or is a case of insufficient supply. It is difficult to come up with a definitive answer. Clearly there is a problem on the supply side with the high dropout rate, but there are significant numbers of Africans graduating with an LLB. Demand for African articled clerks appears to be weak, hence the high numbers attending the School for Legal Practice (although this might be by choice, in some cases). But the number of African attorneys being admitted is increasing steadily, although the absence of data on KwaZulu-Natal makes it

impossible to say much more. Demand for African attorneys, however, is not making much impact on the demographics of the profession, which means that it is relatively weak.[5]

The position with regard to African advocates is worse than that for attorneys. Africans make up a small proportion of the total number of pupils passing the Bar examination, and their number declines from 2001 to 2005. In 2005, only 17 per cent of those who passed the Bar examination were African. Moreover, the majority of African pupils who sit the Bar examination fail. One reason for this appears to be the number coming direct from historically disadvantaged universities. The implication is, first, that African pupils are not getting the right preparation at these universities, and second, that an intervening period of vocational training or work experience might assist them. The end result is a Bar dominated by white advocates.

The preponderance of white advocates has caused serious tensions with regard to the slow pace of transformation of the judiciary. The furore that has surrounded the Cape Judge President, John Hlophe, for the past year or two has thrown this issue into stark relief. The controversy has divided the profession, particularly the Bar, along racial lines. Part of the fall-out has been the Johannesburg Bar's recent election of an all-white council.[6] These events have put the spotlight on the composition of the judiciary, the Bar and the attorneys' profession.

The Bar is of particular importance because it has traditionally provided the pool from which judges are drawn. However, African advocates are in a small minority at the Bar. Furthermore, an interviewee at the GCB pointed to the fact that many African advocates find it difficult to build and sustain a practice because the major (predominantly white) law firms continue to brief white advocates. Lack of transformation in the attorneys' profession and the entrenchment of historical briefing patterns therefore undermine transformation of the Bar. A greater supply of law graduates from universities, a shorter pupillage, and an easier Bar examination are unlikely to make much impact on the racial composition of the Bar in the long term, given this problem. This then impacts on transformation of the judiciary.

To some extent, employment of African law professionals in the public sector is ameliorating the above bias. As noted above, in 2006/07, 51 per cent of professionals employed by the DoJ were African, while 7 per cent were Indian and 6 per cent were coloured. But, while there might be stronger demand in the public sector for African law professionals, this does not detract from the size of the problem in the private sector.

Other perspectives on scarce and critical skills

In broad terms, the above data indicate that there is an adequate supply of law professionals. There is, however, a relative scarcity of African law professionals. We also know from secondary sources that there is a relative scarcity of law professionals in rural areas. Policy changes will probably have a positive impact in regard to these areas of relative scarcity, but it is unclear whether this will be sufficient. The SASSETA could also play a role in this regard by targeting discretionary grants to address these areas of scarcity (SASSETA 2005–2006: 57).

The SASSETA Sector Skills Plan identifies trade mark practice lawyers as scarce skills. In the public sector, it identifies a scarcity with respect to the following: constitutional litigation and all other forms of litigation, except criminal work; international trade law; civil magistrates; trade mark practice lawyers;

5 It should be noted that the gender picture is very similar. Women have made even more progress in catching up (and sometimes exceeding) men at a number of points in the supply pipeline to the legal profession. However, they remain a small minority of practising attorneys and advocates.

6 Race resentments continue to divide Jo'burg bar, *Sunday Independent* 18 November 2007

and state legal advisers (SASSETA 2005–2006: 48). Other positions are also likely to record shortages as the DoJ continues with its expansion programme and creates new posts. However, the DoJ does not predict any difficulties in filling new positions, which confirms that supply is not a problem (SASSETA 2005–2006: 9-10, 33, 49).

However, while the number of LLB graduates has increased, a lot of criticism has been directed at the quality of graduates, in particular, poor literacy and numeracy skills. This raises the spectre of critical skills and the adequacy of the four-year LLB. The complaints have emanated from various sources. The Director-General of the DoJ has referred to the poor quality of law graduates, who, he alleged, were unable to draw affidavits and pleadings. He called on the profession to engage with universities regarding the declining standards. In the debate that ensued, an argument was made that the LLB needed to be upgraded (Van der Merwe 2007: 2).

The shortcomings of the LLB were highlighted again by Bernard Ngoepe, the Judge President of the Transvaal High Court, who called on the government and universities to consider the re-introduction of a five-year LLB. He argued that too many courses had been dropped in making the shift to the four-year LLB and even suggested that the period of articles had become too short.[7] Professor Rob Midgley, the chairperson of the South African Law Deans Association, has taken a more nuanced position. He recognises that there is a need for a firmer academic foundation for graduates, including expanding the non-law components of the LLB curriculum (Midgley 2007: 22, footnote 117), but cautions that it is premature to jettison the four-year LLB and revert to the five-year format:

> We need to give the four-year programme a chance because the reasons to do it in the first place still outweigh those that suggest that it should be taken back to five years.[8]

Muzi Msimang, the president of the BLA, has a different view, arguing that the blame does not lie with the LLB degree but with the vocational training received after the degree. However, he disagrees with the claim that the period of articles is too short.[9]

The implication of the debate is that the four-year LLB has not got the balance right between maintaining high academic standards and making the profession more accessible (that is, increasing supply). But it does not appear that the four-year LLB will be dropped in the short term. In the meantime, a number of initiatives have been launched to address the problems. The Attorneys Fidelity Fund, which has a particular concern regarding numeracy skills, commissioned research on the numeracy programmes in law faculties at all universities in the country. It found that most universities were offering numeracy courses in the first year of the LLB. Those that are not will be assisted by the Fidelity Fund to introduce such courses. The Fund is also directing funding to those university projects that attempt to improve the numeracy and practical skills of graduates (Van der Merwe 2007: 2).

Interviews conducted with legal practitioners suggest that the problem lies with the quality of school education rather than with the LLB curriculum and vocational training. This is beyond the scope of universities to address, but at the same time, universities and the legal profession have to find a way of dealing with the consequences. Related to this problem is one key informant's view that there are sharp differences in the quality of the education between different universities. In short, many historically black universities are not producing LLB graduates of the required standard. This was also alluded to in the DoJ's 1999 discussion document (DoJ 1999: 9). This is an important point, because it could provide an explanation for the low number of African articled clerks and weak demand for African

7 Quality of law degrees questioned, *Mail & Guardian Higher Learning* November 2007
8 Quality of law degrees questioned, *Mail & Guardian Higher Learning* November 2007
9 Quality of law degrees questioned, *Mail & Guardian Higher Learning* November 2007

attorneys. Unfortunately, however, most of the data that we obtained do not provide a breakdown by university, which would allow for a quantitative examination of this contention.

Conclusion

The research shows that there is not an absolute scarcity of law professionals but that African attorneys and advocates are relatively scarce. There is a similar but less severe relative scarcity of African law professionals in the public sector. There is also a relative scarcity of law professionals in rural areas, although this is not quantifiable. The SASSETA Sector Skills Plan and interviews reveal other critical skills, such as experienced corporate lawyers and patent and trade mark attorneys, as well as specialists in the public sector. But the numbers needed do not appear to be high; it seems that it is more a case of a longer search for suitable candidates rather than a total absence of such law professionals. The most important critical skill relates to the numeracy and literacy abilities of LLB graduates. There also appears to be unevenness in the quality of graduates across universities (which we were unable to explore in more detail).

One question these findings raise is whether the existing legal education and training infrastructure will be adequate to address these problem areas. A second set of questions also arises in relation to transformation: has transformation contributed to some of these shortages, or are these shortages slowing transformation?

There is no hard and fast answer to the first question. On the face of it, the legal profession has an extensive education and training system comprising, on the one hand, law faculties at 19 universities, and on the other hand, the LEAD, the BLA's Legal Education Centre, the Bar Councils, and the Justice College (which will soon be joined by the South African National Justice Training College). In addition, a number of professional bodies in the private and public sectors provide specialist training in, amongst other things, corporate law, intellectual property law, and public financial management. These institutions provide education and training that cover generic skills needed across the legal profession as well as a wide range of specialist skills. There are also training initiatives to address problem areas such as numeracy and literacy.

The above appears to be an adequate education and training infrastructure. It certainly seems to be sufficient to compensate for the historical tendency of law firms not to do any training, other than on-the-job vocational training.

The second of the above questions is much more difficult to answer. Transformation, including the introduction of the four-year LLB, appears to have increased supply to the profession. Then the picture begins to get complicated. It seems that the quality of graduates being supplied is not the same, mainly because of differences in the capacities of universities. Given historical patterns of university attendance, the quality difference assumes a racial guise, that is, historically black universities are producing African LLB graduates who are not as well prepared as graduates from the other universities. While demand has been increasing, it appears to be well below supply, which means that legal firms have the luxury of picking articled clerks and admitted attorneys who are perceived to be the best qualified. In other words, African graduates from historically black universities are forming a surplus. Increased supply is therefore not changing the demographics of the profession.

It is ironic that this has led to a backlash against the four-year LLB. The LLB does not appear to be the main problem. Neither does the period of vocational training. The root causes are a school system that is not functioning properly and a university system that remains unequal. While demand increases

moderately relative to supply, these factors will hamper transformation, whether demand is based on perception or reality.

References

Asgisa (Accelerated and Shared Growth Initiative for South Africa) (2007) A summary. Accessed 11 December 2007, www.thepresidency.gov.za/docs/reports/Asgisa.

DoJ (Department of Justice and Constitutional Development, South Africa) (1999) Discussion paper on transformation of the legal profession. Pretoria: DoJ

DoJ (2002) *Annual report 2001/2002*. Pretoria: DoJ

DoJ (2007a) *Annual report 2006/2007*. Pretoria: DoJ

DoJ (2007b) Draft for discussion: 3rd Draft Legal Services Charter. Pretoria: DoJ

DoL (Department of Labour, South Africa) (2007) Job vacancy database April 2004 to March 2007. Pretoria: DoL

Erasmus JC (2006) Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Research proposal prepared for the Department of Labour, Pretoria

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Report commissioned by the Department of Labour, Pretoria

GCIS (Government Communication and Information Service) (2007) *South Africa yearbook 2006/2007*. Accessed 4 December 2007, www.gcis.gov.za/docs/publications/yearbook.htm.

Iya PF (2000) Legal system and legal education in Southern Africa: An overview of past influences and current challenges. Paper delivered at the Conference of Legal Educators, Florence, 24–27 May. Accessed 9 November 2007, http://www.aals.org/2000international/english/southafrica.htm.

Midgley R (2007) South Africa: Legal education in a transitional society. Paper presented at a Joint Meeting of the Law and Society Association and the Research Committee on the Sociology of Law of the International Sociological Association, Humboldt University, Berlin, 28 July

Ministry of Justice, South Africa (1995) *Justice vision 2000: Five year national strategy for transforming the administration of justice and state legal affairs*. Pretoria: DoJ

SASSETA (Safety and Security Sector Education and Training Authority) (2005–2006) Skills for a safe and secure society: A skills plan for the policing, private security, legal, justice, correctional service, defence and intelligence sector. Sector skills plan submitted to the Department of Labour. Midrand: SASSETA

Stats SA (Statistics South Africa) (1996–1999) *October Household Survey*. Pretoria: Stats SA

Stats SA (2000–2005) *Labour Force Survey*. Pretoria: Stats SA

Umhlaba Skills Services (2007) National Skills Authority – Briefing paper: Scarce and critical skills. Paper commissioned by the Department of Labour, South Africa and German Technical Co-operation (Gesellschaft für Technische Zusammenarbeit (GTZ)), Eschborn, Germany

Van der Merwe P (2007) 'The trouble with LLB graduates…' Editorial. *De Rebus* 463: 2

CHAPTER 9

ICT professionals and associate professionals

Joan Roodt and Andrew Paterson

Public discussion about information and communications technology (ICT) skills shortages is peppered with multiple claims as to the size of current shortages and the magnitude of future skills shortfalls. The scale of claimed ICT skills shortages varies substantially from source to source, as do persistent claims of over-supply and unemployment among ICT graduates.

Estimates of shortages are regularly published in the public domain, suggesting a current or likely future ICT skills crisis. Considering the centrality of ICT skills to sustaining economic growth across the South African economy, this is perturbing. However, claims that are openly based on the 'gut-feel' of industry insiders, or localised circumstantial evidence, have quite limited value.

In other instances, advocates for improving ICT skills supply cite evidence from research studies as to the nature and size of skills shortages. While such privately funded research data may be potentially useful, there is seldom sufficient information given about the methodology through which such data were obtained. It is fundamentally important to have access to such information, because without it, there is no way of knowing whether two studies of the same phenomenon – in this case the size of the ICT workforce – are comparable.

For these reasons we begin this chapter by providing descriptions of the data sources we employ, as well as our occupational definitions of ICT workers. The data we use are from the October Household Survey (OHS) of 1996–1999 and the Labour Force Survey (LFS) of 2000–2005. Both of these surveys are designed and administered by the South African government's national statistics agency, Statistics South Africa (Stats SA). The reason why data from two different data sources, the OHS and the LFS, are used is because Stats SA terminated the OHS after 1999.

A challenge arising from the data is high annual fluctuations in the number counts for the key occupational categories to be discussed. This is a product of the process of weighting raw data obtained through a sample to approximate national parameters. Both of the surveys on which this analysis depends – the OHS and the LFS – are based on samples of the national population.

In order to smooth out the effects of these fluctuations in both datasets, we decided to create an average for the period covered by each survey. Thus, for the OHS, which ran for a period of four years from 1996 to 1999, we generate an annual average employment number per occupational group. Similarly, for the six-year period from 2000 to 2005, we create an average employment number. In so doing, we are in a position to establish trends in employment for the 10-year period 1996–2005. It should be apparent that there is not an even split in the number of years of data between the period before the

millennium and the second period post-millennium. This is because we considered it more important to retain the integrity of each series of survey data (OHS 1996–1999 and LFS 2000–2005) than to group one year of LFS data with the OHS series to create an even five-year split for each period.

Knowing how many workers are currently employed in a particular occupation, and having additional information about their ages and qualification levels, should make it possible to generate estimates of how many such occupational workers are likely to cease working and need to be replaced. Calculation of replacement rates involves an estimate of how many similarly – or better – skilled people must be produced through education and training in order to sustain the size of an occupational group, whether it is stable, expanding or contracting in response to economic growth and labour market forces. An investigation of the shape and size of the ICT workforce can generate information about the relative size of this workforce in relation to employment in particular economic sectors or within the whole labour market.

In estimating the size of the ICT workforce, the investigator must generate a definition that is appropriate to his or her purposes and can be operationalised. By appropriate, we mean a definition that accords with the investigator's intention to estimate the size of the entire ICT workforce or to estimate the size of a particular sub-category of ICT worker. There are challenges faced in each approach. Adopting a definition that encompasses all ICT workers in an economy presents the challenge of deciding on what basis a worker is or is not an ICT worker. The more inclusive this definition becomes, the larger the apparent size of the ICT workforce. A fundamental challenge in estimating the size of the entire ICT workforce is how to judge which occupations should or should not be included in the category of ICT workers. For instance, in a number of work environments the core functions and activities central to occupational identity (for example, graphic design) have been migrated almost entirely from the traditional analogue environment into a digital workspace. The flexibility and adaptability of ICT supports the continued diffusion of ICT applications into occupational work environments. Rising levels of integration of ICT into the day-to-day work of different occupations and increased intensity of use of ICT tools continue to impact on the question: what is an ICT worker?

A researcher could design and implement his or her own survey to gather data, in which case a sample frame, and kinds of data that are required, can be defined. But because this kind of survey is very expensive and time-consuming, researchers are more typically limited to sourcing data from national statistical agencies which undertake regular labour market surveys. Moreover, national statistical agencies are uniquely positioned to conduct surveys on a regular annual or sub-annual basis, and are frequently the only source of datasets that make longitudinal trend analysis possible.

In the latter case, the researcher is restricted to working with data elements as received from the national statistics agency, the nature of which the researcher would not ordinarily be able to influence. All survey datasets have limitations. The following analysis is therefore limited to what is permitted within the parameters of the OHS and LFS datasets obtained from Stats SA.

Thus far, we have deliberately used a broad generic term – 'ICT worker' – to refer to the multiple occupational categories in which people create and produce ICT products and services, or intensively use ICT in the process of fulfilling their particular occupational role.

The South African Standard Classification of Occupations (SASCO) list gives information on how occupational data are captured in the OHS and LFS surveys. It therefore serves as the framework according to which the occupational analysis in this chapter is undertaken (Stats SA 2005).

There are two core occupational categories employed by the SASCO that can be taken to refer to ICT workers: computer professionals, and computer associate professionals. The SASCO describes the two categories as follows:

- computer professionals: include computer programmers, system analysts/software engineers, and other computer science professionals;
- computer associate professionals: include assistant system analysts, computer peripheral equipment operators, and robot controllers.

This primary categorisation distinguishes between the high-level strategic functions of 'computer professionals' and the intermediate-level activities of 'computer associate professionals'.

Another category refers to workers in the field of electronics and telecommunications engineering. The SASCO refers to 'electronic and telecommunications engineers' and 'electronic and telecommunications engineering technicians' which comprise the following occupations:

- electronic and telecommunications engineers: include electronic engineers, telecommunications engineers, computer hardware design engineers, and aerospace engineers;
- electronic and telecommunications engineering technicians: include computer technicians, aerospace technicians, computer hardware design technicians, electronic technicians, and telecommunications technicians.

The SASCO separates electronic and telecommunications engineers from technicians. This is an important distinction to make, as it reflects that within occupational fields related to ICT, there are different *skills levels*.

If we were to count the employment data of only computer professionals, computer associate professionals, electronic and telecommunications engineers, and electronic and telecommunications technicians, we could claim to have made good progress towards estimating the overall size of the South African ICT workforce. Such a claim would be valid in two important dimensions.

First, in selecting the above four occupational categories, we would be accounting for a large number of the workers employed in the ICT sector, which comprises enterprises operating in the field of electronics, enterprises operating in the field of telecommunications, and enterprises operating in the field of information technology (IT).[1] In the latter case, enterprises focus on providing software and IT products and services.

Second, the people employed in the four occupational categories would be identified across the economy, irrespective of economic sector. The analysis could therefore reveal the numbers employed in these occupations in every sector of the economy, such as mining, manufacturing, electricity, construction, trade, transport, finance and services. In other words, in adopting this approach, this study focuses on workers of specified occupations across all sectors of the economy. This is different to focusing only on workers employed in the ICT sector.

Although this approach does provide a sound basis from which to proceed, we must accept that our estimate of the overall national ICT employment numbers, based on the number of workers in the above four categories, will still be incomplete. It is quite easy to under-estimate the size of the ICT workforce if the growing impact of ICT on the business processes and occupational structures of particular industries is not taken into account. We argue that there are a number of occupational categories that

1 These enterprises would fall largely within the domain of the South African Information Systems, Electronics and Telecommunications Technologies (ISETT) Sector Education and Training Authority (SETA), which categorises the sector in three sub-sectors: Electronics, Telecommunications and Information Technology.

in the past two decades have been radically affected by a transformation of the medium within which they work from analogue to digital. The effects of this change are strongly apparent in the media fields of photography, digital broadcasting (including radio and television), multimedia, graphic design and industrial design.

Even though the occupations related to these fields cannot be defined fully as ICT occupations, we should consider them as hybrid occupational forms in which the original skills sets are reshaped by and practised in a powerful digital environment that provides the substantial benefits arising from convergence of networks, telecommunications services, and content. Consequently, we propose to include in our estimate of the ICT workforce the following 'hybrid occupations', which combine high usage of ICT applications, and high information intensity, with 'traditional' skills associated with largely defunct analogue practices:

- photographers and image and sound equipment (including television, motion picture, radio, recording, disc, tape, wire and sound mixing) operators;
- broadcasting and telecommunications equipment (including telegraphers and morse code) operators, transmitting equipment (television, radio, video and telecine) operators, and cinema operators;
- graphic or industrial designers, including inter alia designers of graphic, commercial, industrial, jewellery, fashion, interior, textile, package, dress, furniture, motion picture set, display, exhibition, scenery, stage set, poster and advertising products, and illustrators of books.

In addition to the inclusion of media-linked occupations, we also recognise that ICT has impacted on demand for certain skills that reside in traditional categories. For example, within the broad occupational category of mathematical professionals are people who are specialised in operations research, which has increasingly been applied in the development of ICT-related systems:

- Mathematical professionals, as an occupational category, includes 'operations researchers'. Operations research is used *inter alia* 'to improve an entire system' and is strongly applicable in the following ICT-related activities: construction of telecommunications networks at the lowest cost, designing the layout of a computer chip to reduce manufacturing time, and automating human-driven operations processes (Hamdy 2006).

While there is strong evidence that a proportion of mathematicians are operations researchers whose work is dedicated to the design and evolution of various types of ICT systems and products, we cannot include the total numbers of mathematicians counted in the Stats SA surveys. Unfortunately, the OHS and LFS data cannot provide sufficiently disaggregated data which can show what proportion of all persons whose occupation is as mathematicians fall into operations research as a sub-category of mathematicians. The way around this problem was to establish whether any other data source from Stats SA had disaggregated mathematicians. According to the Manpower Survey of 1996, a quarter of all mathematical professionals were operations researchers (Stats SA 1996). We presume that the demand for operations research from the ICT sector has increased since 1996, but will incorporate in our calculations a quarter of the number of mathematicians in our workforce estimates.

In the following sections of the chapter we will build our estimate of the total ICT workforce in accordance with the foregoing discussion.

Computer professionals and associate professionals (CPAPs) constituted over 40 per cent of the ICT workforce within our broad definition of ICT workers, as discussed above. The next-largest occupational group was electronic and telecommunication engineering technicians, at 26.6 per cent, whereas the related electronic and telecommunication engineers group constituted only 1.9 per cent of the ICT workforce. Media-related occupations constituted only 29.3 per cent of all ICT workers.

The drivers of demand for 'computer professionals' and for 'electronics and telecommunication engineers' (which are the two largest groups) still differ, notwithstanding levels of convergence. For these reasons, the detailed analysis of ICT workers focuses exclusively on two occupational categories, namely *computer professionals* and *computer associate professionals*.

In the course of the analysis in part one below, we have been able to make limited inferences about possible shortages of computer professionals. In the second part of the analysis, we present an analytic overview of graduate production from higher education (HE) in the fields of study which are considered to be the main source of qualified computer professionals outside of the private ICT training industry. Drawing on *data from a survey of vacancies* in part three, we formulate some tentative hypotheses about labour shortages in the computer professional occupational fields. Furthermore, in applying a standard economic theory to an analysis of *data on the remuneration* of professionals and of computer professionals in South Africa, we examine changes in remuneration of computer professionals in order to obtain some evidence of a labour shortage in these occupations.

Finally, we attempt to bring together in part three the data that we have assembled and analysed in the first two parts of this chapter. In doing this, we attempt to *bring the demand and supply sides together to produce a projection model* that projects possible demand into the future and predicts a graduate output curve into the future. The curves of demand and supply are then juxtaposed so that a putative shortage/over-supply figure is produced.

Part one: An overview of the CPAP sector

Sub-sectors in which computer professionals and associate professionals engage

In looking at the various sub-sectors in which CPAPs worked, it was found that more than 7 in every 10 computer *professionals* were absorbed into the financial and business services sector. The only other sector which attracted more than 10 per cent of the population of CPAPs was manufacturing. In 1996–1999, 10.3 per cent of computer professionals worked in manufacturing and this increased slightly to 11.8 per cent in 2004–2005. In contrast, there was a sharp decrease in the proportion of computer *associate* professionals employed in manufacturing (Table 9.1). The factors contributing to this shift would need to be investigated further.

In the financial and business services sector and in the manufacturing sector, changes occurred in the proportions of employment of high-level and intermediate-level computer professionals. These changes worked in opposite directions. In the financial and business services sector, the number of intermediate-skilled computer associate professionals increased to the point where there was virtually a 1 : 1 relationship with the higher-skilled computer professionals. In the manufacturing sector, in 1996–1999, intermediate-skilled computer associate professionals outnumbered computer professionals by 7 : 3, but by 2004/2005 the situation was reversed and computer associate professionals were themselves outnumbered 7 : 3 by computer professionals.

It is important to seek explanations for these shifts in the skills make-up of sectors which employ large numbers of CPAPs. Did the ICT skills requirements in these sectors change because new technologies adopted across the industry altered the optimal ratio of ICT high to ICT intermediate skills in enterprises, or because enterprises across the industry adopted new business models which reduced/increased the need for intermediate ICT skills, or because changes in the labour market after 2000 affected the balance of professionals to associate professionals, or because enterprises created career path opportunities through which workers were promoted to full professional status, perhaps with

TABLE 9.1: *Distribution of CPAPs, by economic sector, 1996–2005*

	1996–1997		1998–1999		2000–2001		2002–2003		2004–2005	
ICT occupation by economic sector	N	%	N	%	N	%	N	%	N	%
Professionals										
Agriculture	0.0	0.0	239	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Mining	271	1.2	629	1.9	132	0.4	345	1.2	305	1.0
Manufacturing	2 314	10.3	2 788	8.5	3 209	10.2	2 405	8.6	3 538	11.8
Electricity	366	1.6	413	1.3	637	2.0	481	1.7	728	2.4
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trade	1 516	6.8	318	1.0	2 237	7.1	1 362	4.8	610	2.0
Transport	2 047	9.1	2 709	8.2	2 881	9.2	964	3.4	1 085	3.6
Finance	11 397	50.8	23 284	70.9	19 781	63.0	19 738	70.2	22 263	74.3
Services	3 426	15.3	2 475	7.5	2 537	8.1	2 823	10.0	1 437	4.8
Other activities	1 112	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	22 446	100.0	32 857	100.0	31 413	100.0	28 119	100.0	29 967	100.0
Associate Professionals										
Agriculture	0.0	0.0	74	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Mining	703	2.6	484	1.7	1 419	3.2	691	1.8	141	1.1
Manufacturing	5 629	20.9	752	2.6	1 690	3.8	4 778	12.3	1 673	12.7
Electricity	280	1.0	469	1.7	1 041	2.4	470	1.2	109	0.8
Construction	0.0	0.0	626	2.2	0.0	0.0	188	0.5	0.0	0.0
Trade	2 896	10.8	2 531	8.9	3 852	8.7	3 131	8.0	1 008	7.7
Transport	4 732	17.6	1 842	6.5	3 058	6.9	4 429	11.4	937	7.1
Finance	9 990	37.1	18 364	64.7	25 107	56.7	21 464	55.0	9 303	70.6
Services	1 791	6.7	3 237	11.4	7 802	17.6	3 592	9.2	0.0	0.0
Other activities	908	3.4	0.0	0.0	0.0	0.0	258	0.7	0.0	0.0
Unspecified	0.0	0.0	0.0	0.0	316	0.7	0.0	0.0	0.0	0.0
Total	26 927	100.0	28 378	100.0	44 286	100.0	39 002	100.0	13 172	100.0

Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)

access to additional training? Such questions must be posed and adequate explanations need to be found. These are the kinds of questions that will help us to understand the drivers of ICT skills shortages or over-supply and to respond accordingly. Similar questions are relevant also to sectors which employ smaller numbers of computer professionals, such as the 'trade', 'transport storage and communications' and 'social and personal services' sectors.

Over the 2004–2005 period, within the financial and business services sector, the overwhelming majority of CPAPs worked in software consultancy and supply, while 13.6 per cent worked in hardware consultancy, 7.2 per cent worked in monetary intermediation (plus 2.5 per cent in 'other financial intermediation'), and 4.4 per cent worked in legal, accounting, bookkeeping and auditing environments. There is a relatively sizeable share of employees in 'other computer-related activities', but further investigation would be required to establish what constitutes this group.

Turning to the manufacturing industry, the bulk of CPAPs working in manufacturing were employed in motor vehicle manufacture, with a further 16.9 per cent working in the manufacture of office, accounting and computer machinery industry. Relatively small numbers were employed in the manufacture of basic iron and steel and of electronic components. The latter statistic gives some indication of how small the electronic component manufacturing sector is in South Africa, while the much larger percentage working in the manufacture of office accounting and computer machinery sub-sector are engaged largely in assembly of computers rather than in manufacturing.

Provincial distribution of computer professionals and associate professionals

The spatial distribution of CPAPs provides a sense of the broad labour market situation within which ICT skills shortages and over-supplies are contextualised. Nine in every 10 computer professionals is located in either Gauteng, the Western Cape or KwaZulu-Natal. In each of the other six provinces, the share of computer professionals is below two per cent (Table 9.2). Difficulties in filling computer worker vacancies will be experienced in the provinces which have smaller GDPs and an even smaller computer

TABLE 9.2: *Provincial distribution of CPAPs and GDP, 2000–2005*

Province	Average employed p.a. (2000–2005)		GDP
	N	%	%
Gauteng	34 246	55.2	33.4
Western Cape	14 241	23.0	14.5
KwaZulu-Natal	6 625	10.7	16.5
Free Sate	1 789	2.9	5.4
Mpumalanga	1 598	2.6	6.9
Eastern Cape	1 335	2.2	8.1
North West	935	1.5	6.5
Limpopo	912	1.5	6.5
Northern Cape	306	0.5	2.4
Total	61 987	100.0	100.0

Source: Quantec 2007 (Stats SA LFS data for 2000–2005)

professional workforce. The spatial concentration of ICT professionals will be mainly in urban settlements, which will further distort access to ICT professionals in provinces where the population is largely rural. Provinces covering large areas make access to computer professional services difficult, because of travel and time costs. These environments will constrain the capacity of government to upgrade, let alone innovate, in its use of ICT.

Distribution of computer professionals and associate professionals by public and private sector

ICT is an important channel of service delivery for the future. South African provincial and national government departments and institutions, and municipalities at local government level, constitute the single biggest corporate market for computer hardware, software and services in the country. However, there has been a gradual decrease in the number of CPAPs in the public sector over the period 2000–2005. Private-sector employment of CPAPs also declined in the period, though not as sharply.

In 2005, as many as 93.1 per cent of CPAPs worked in the private sector and only 6.9 per cent in the public sector (Figure 9.1). The public sector appears to have shed as many as 10 000 computer professionals in the 5-year period. However, this shift does not necessarily reflect a direct loss of 10 000 computer professionals from the workforce employed to operate government ICT systems. It is more likely to reflect increased resorting on the part of government to outsourcing its IT functions to private companies which design, implement and maintain government IT systems. More workers will be employed by private-sector enterprises as a result, though they are actually working on government projects. This can lead to a significant under-estimate of ICT employment that is dependent on government projects.

There are several important issues embedded in government outsourcing of ICT work. Attractive private-sector wages draw former public-sector IT workers into the private-sector labour market. This is a serious concern for sustaining the integrity of government information and decision-making support systems in general. It is also problematic, since certain government information functions cannot be outsourced for reasons of security and sensitivity.

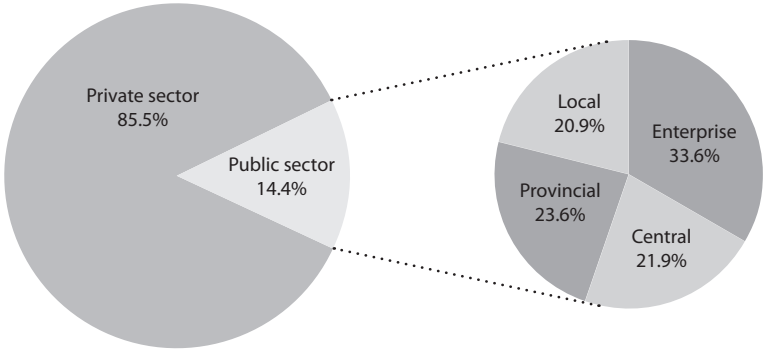
We must also question whether private-sector enterprises which are benefiting from outsourced public contracts are paying sufficient attention to training appropriately skilled people to fulfil their contracts. Claims by private-sector companies (which are contracted to government) about skills shortages may reflect a combination of an already existing poor government skills base and a continuing low propensity for private companies to train.

State-owned enterprises employ the largest number of ICT professionals, followed by provincial, central and local government. Provinces employ only 23.6 per cent of government computer workers, yet there are nearly 100 provincial-level departments with massive service delivery responsibilities including education, health and social welfare in this sphere. This suggests that ICT outsourcing is mainly resorted to in the provincial and national spheres.

Computer professionals and associate professionals according to level of skill

The general pattern of recruiting associate computer professionals with intermediate skills and recruiting computer professionals with high skills was retained across the 1996–1999 and 2000–2005 periods (Table 9.3). The fact that a marked increase in proportions of professionals with high skills occurred over the 2000–2005 period suggests that the education and training supply-side institutions did contribute substantially to raising skills among professionals.

FIGURE 9.1: *Distribution of CPAPs, by private sector and detailed public sector, 2000–2005*



Source: Quantec 2007 (Stats SA LFS data for 2000–2005)

This does not necessarily mean that complaints about a shortage of IT skills were unfounded. Table 9.3 shows that while high skill levels are required, the highest proportion of computer professionals (58.8 per cent) were at intermediate skill level in the period 1996–1999. By 2000–2005, the largest proportion was at high skill level (59.5 per cent) but the proportion that had only attained intermediate level was still high (36.4 per cent), indicating an ongoing shortage of appropriately trained professionals. Among computer associate professionals, where intermediate skills are predominantly required, there was a decline at the intermediate level (from 85.4 to 77.1 per cent), an increasing proportion at the low-skill level (from 10.6 to 16.3 per cent) and very small percentages at high skill level (from 3.1 to 5.9 per cent). These trends all indicate shortages of appropriately trained computer associate professionals.

TABLE 9.3: *CPAPs according to level of skill, 1996–2005*

Level of skill	1996–1999		2000–2005	
	Average p.a.	%	Average p.a.	%
Computer professionals				
Low	3 464	12.5	959	3.2
Intermediate	16 270	58.8	10 863	36.4
High	7 776	28.1	17 752	59.5
Unspecified	141	0.5	259	0.9
Total	27 651	100.0	29 833	100.0
Computer associate professionals				
Low	2 937	10.6	5 243	16.3
Intermediate	23 626	85.4	24 803	77.1
High	848	3.1	1 891	5.9
Unspecified	242	0.9	217	0.7
Total	27 652	100.0	32 154	100.0

Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)

TABLE 9.4: *CPAPs, by race and gender, 1996–2005*

Gender and race	Average employed per annum				Average annual growth
	1996–1999		2000–2005		
	N	%	N	%	%
Black males	13 278	24.2	16 583	26.9	2.5
White males	24 634	44.8	30 102	48.8	2.3
Black females	6 802	12.4	5 785	9.4	−2.2
White females	10 233	18.6	9 267	15.0	−1.1
Total	54 946	100.0	61 737	100.0	1.3

Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)

The computing professionals category turned out to be the best stocked in terms of appropriate skill levels. Because the skills range of computer associate professionals ranges quite widely, we are less confident in pointing to specific shortages in this category.

Employment of computer professionals and associate professionals by race and gender

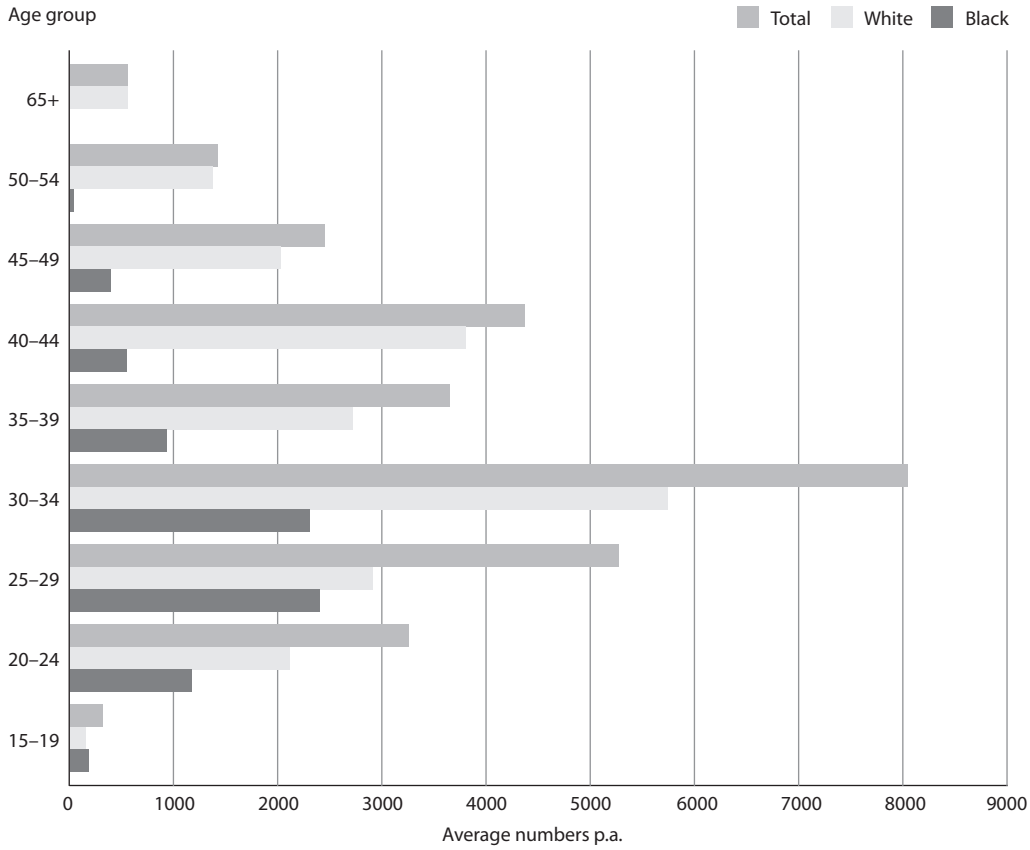
A key question in the post-apartheid labour market is the extent to which employment equity has taken root. In the case of computer professionals, there was an overall increase of 7.9 per cent in employment over the 1996–1999 and the 2000–2005 periods. Among computer associate professionals, there was a more substantial 16.3 per cent increase in employment over the same period. There was a 1.8 per cent increase in the proportions of black (i.e. African, coloured and Indian) computer professionals and a 2.2 per cent decrease in the percentage of white computer professionals between the two periods (Table 9.4). Even though there was an increase in the real numbers of all racial groups among the associate professionals, the real and proportional gains were made among white associate professionals, representing a regressive shift in terms of equity needs.

In regard to gender balance, the gender composition of the computer professional occupational categories worsened between 1996–1999 and 2000–2005. There was an increase in the numbers of women working as computer professionals, but a decline in the employment of women in the associate professional category. Conversely, there was growth in both the male computer professional category and the male associate professional category over the same period. Clearly, conditions privileged male employment.

Employment of computer professionals and associate professionals according to age

The distribution of CPAPs according to age is an important parameter to bring into the reckoning from a labour market supply and demand perspective. The population distribution of computer associate professionals appears far healthier than that of computer professionals. The proportion of computer professionals employed who are younger than 30 is much smaller than that for computer associate professionals (Figure 9.2).

FIGURE 9.2: *Average number of computer professionals p.a., by age and race, 2000–2005*

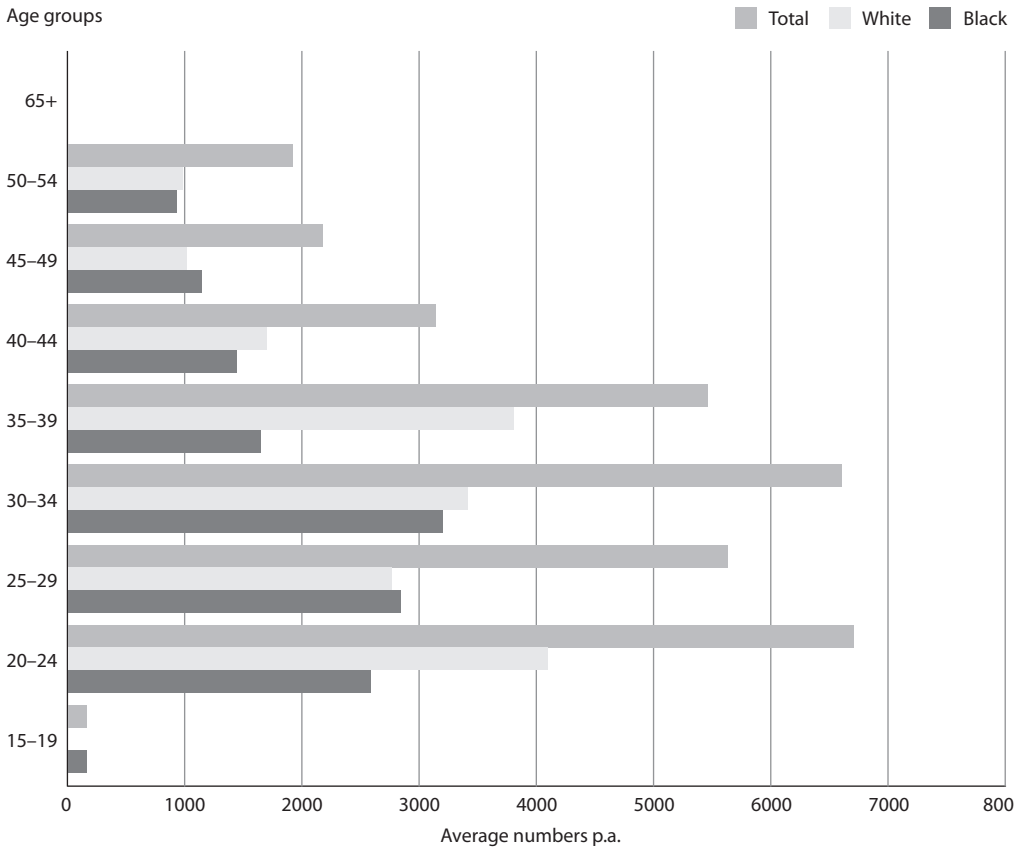


Race	Age group									
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–64	65+	Total
Black	2.1	14.7	29.9	28.8	11.9	7.0	5.0	0.6	0	100
White	0.7	9.8	13.6	26.9	12.7	17.8	9.5	6.5	2.7	100
Total	1.1	11.1	18.0	27.4	12.5	14.8	8.3	4.9	2.0	100

Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)
Note: 'Black' comprises the African, coloured and Indian groups.

Furthermore, transformation has occurred to a greater extent among computer associate professionals than among computer professionals, as there were quite a number of black computer associate professionals in both the lower as well as higher age cohorts; this trend will continue in the future, as almost two-thirds of black computer associate professionals are younger than 35 years of age, while 42.3 per cent of white computer associate professionals are older than 35 and will retire in the near future (Figure 9.3).

FIGURE 9.3: *Average number of computer associate professionals p.a., by age and race, 2000–2005*



Race	Age group									
	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–64	65+	Total
Black	1.3	18.6	20.3	22.8	11.9	10.3	8.2	6.7	0	100
White	0.0	23.0	15.6	19.1	21.4	9.5	5.8	5.6	0	100
Total	0.6	21.1	17.7	20.7	17.2	9.9	6.8	6.1	0	100

Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)
Note: 'Black' comprises the African, coloured and Indian groups.

Part two: Supply of computer professionals and associate professionals

Given the demand challenges, we move to the current supply of CPAPs who are needed to address demand challenges. The main contributor to ICT skilling in terms of volume and variety of learning opportunities is the private sector, as three-quarters of those with intermediate skills will have acquired these skills from private training providers (Moleke et al. 2003). As a very small proportion of learn-

ing opportunities at private ICT training institutions could be said to be equivalent to a HE qualification (Roodt 2003), our analysis addresses only the contribution of South African HE institutions to the supply of ICT professionals.

Enrolment

Black candidates dominate enrolment at diploma/certificate level and to a slightly lesser extent at the first (undergraduate) degree level, while white candidates constitute the majority of enrolment at the postgraduate level, which is dominated by white men (Table 9.5). The share of black enrolments decreases as the level of qualification rises. Decreasing black student enrolment at higher levels of qualification can be attributed to the attraction of entering the labour market immediately upon completion of the initial qualification, or to difficulties in completing the study programme because of lack of funding, disadvantaged school background or insufficient academic support.

We need to investigate further the position of the very substantial numbers of diploma and certificate students, who are mostly black. Establishing the academic background of students, whether they are enrolled on a part-time or a full-time basis, what the curriculum of such programmes is, and what the vocational-theory balance of such diploma/certificate programmes is, will assist us in assessing the contribution of such qualifications to broadening the ICT skills base and increasing equity of access to the workplace.

Graduations

With regard to graduations, graduate output yielded an annual average increase of 11.7 per cent over the period. The main locus of growth was with African graduates, whose numbers significantly exceeded those of white graduates for the first time in 2003. The share of white graduates peaked in 2002 and declined over the ensuing years. In effect, African graduate production increased sevenfold over the decade (Figure 9.4).

Changes occurred in the overall distribution of graduates across qualification levels. Graduates holding certificates and diplomas, as a proportion of all graduates, declined from 51 per cent to 34.5 per cent, while the share of graduates with degrees increased from 30.8 per cent to 46.6 per cent between 1996 and 2005. Postgraduates, as a share of all graduates, held the same proportion (Table 9.6). This means that there was an increase in the overall qualification levels per cohort over the period that was available to the labour market.

Very encouraging is that by 2005 the number of black, female graduates with computer science and data processing, across all qualification levels, was greater than the number of white male graduates. However, it is noticeable that the proportion of male holders of certificate/diplomas declined significantly in relation to all other qualifications between 1996 and 2005, whereas this was not as evident for women (Table 9.7).This proportion must be monitored, lest increases in the number of female graduates become concentrated among lower qualification levels.

A snapshot of graduate numbers per sub-field in 2005 reveals that only a few study fields are responsible for a major share of graduate production. The major four contributors are: information and database systems, applications in computer science and data processing, computer operations and operations control, and programming languages. Together, these study fields contribute 75 per cent of all graduates in the computer science and data processing fields. Yet only two, information and database systems, and computer operations and operations control, increased their share of graduates between 1999 and 2005 (Table 9.8). The question is why these patterns emerged, and to what extent the shifts in graduate numbers between the sub-fields resolve or aggravate labour market demand.

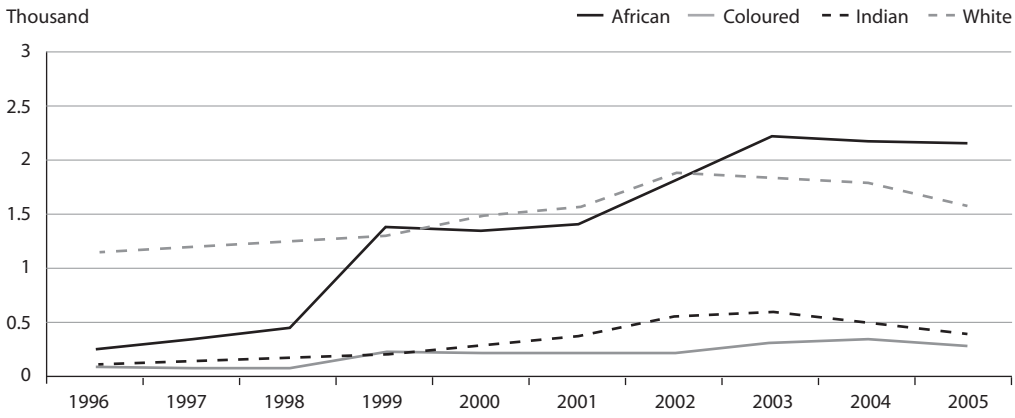
TABLE 9.5: *Enrolment in computer science and data processing, by race group and gender, 1996–2005*

Qualification	Race	Gender	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth (1996–2005)
			N	N	N	N	N	N	N	N	N	N	%
Certificate / diploma	Black	Men	1 535	2 236	2 947	3 658	3 322	2 093	1 936	2 341	2 330	2 544	5.8
		Women	1 101	1 684	2 463	3 243	3 089	1 523	1 551	2 076	1 858	1 934	6.5
	White	Men	1 122	1 101	990	880	664	394	443	407	341	370	−11.6
		Women	431	399	415	430	326	142	175	126	120	109	−14.2
	Unknown	Men	0	0	0	22	0	1	1	1	0	0	0.0
		Women	0	0	0	24	0	1	0	1	1	0	0.0
	Total		4 188	5 420	6 815	8 257	7 401	4 154	4 105	4 952	4 650	4 957	1.9
Degree	Black	Men	396	429	523	616	1 404	1 916	1 988	1 884	1 180	1 164	12.7
		Women	238	344	439	534	1 112	1 454	1 350	1 240	758	708	12.9
	White	Men	543	620	589	558	759	944	1 072	958	678	511	−0.7
		Women	286	300	299	297	278	344	351	257	167	120	−9.2
	Unknown	Men	0	0	0	1	0	1	0	2	5	4	0.0
		Women	0	0	0	0	0	0	0	1	1	3	0.0
	Total		1 464	1 694	1 850	2 006	3 553	4 657	4 761	4 342	2 790	2 509	6.2

Qualification	Race	Gender	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth (1996–2005)
			N	N	N	N	N	N	N	N	N	N	%
Postgraduate	Black	Men	62	94	82	69	77	109	159	234	201	185	12.8
		Women	21	55	52	49	37	58	79	123	104	104	19.2
	White	Men	184	184	164	145	128	217	298	324	264	273	4.5
		Women	73	57	52	47	48	81	100	113	80	55	−3.1
	Unknown	Men	0	0	0	0	0	0	0	3	0	0	0.0
		Women	0	0	0	0	0	0	0	0	0	0	0.0
	Total		341	390	350	311	289	464	636	798	648	618	6.8
Total combined	Black	Men	1 993	2 760	3 552	4 344	4 803	4 118	4 083	4 459	3 711	3 893	7.7
		Women	1 360	2 083	2 954	3 825	4 238	3 035	2 980	3 439	2 720	2 746	8.1
	White	Men	1 850	1 905	1 744	1 583	1 551	1 554	1 813	1 689	1 282	1 153	−5.1
		Women	789	756	765	774	652	566	626	496	367	284	−10.7
	Unknown	Men	0	0	0	23	0	2	1	6	5	4	0.0
		Women	0	0	0	24	0	1	0	2	2	3	0.0
	Total		5 993	7 504	9 015	10 573	11 243	9 275	9 502	10 092	8 088	8 083	3.4

Source: DoE 1996–2005

FIGURE 9.4: *Output at HE institutions in computer science and data processing, by race, 1996–2005*



Race	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average annual growth (1996–2005)
	N	N	N	N	N	N	N	N	N	N	%
African	259	357	457	1 368	1 348	1 423	1 822	2 210	2 158	2 143	26.5
Coloured	86	106	108	215	240	227	235	327	362	316	15.6
Indian	128	189	191	239	312	374	559	605	514	415	14.0
White	1 172	1 263	1 293	1 300	1 488	1 574	1 863	1 841	1 794	1 575	3.3
Total	1 645	1 915	2 049	3 122	3 388	3 598	4 479	4 983	4 828	4 449	11.7

Source: DoE 1996–2005

TABLE 9.6: *Proportionate share of graduate numbers, by qualification level and race, 1996 and 2005*

	1996		2005	
	N	%	N	%
Certificate/diploma: black	310	18.5	1 324	28.9
Certificate/diploma: white	544	32.5	256	5.6
Degree: black	127	7.6	1 293	28.2
Degree: white	389	23.2	846	18.4
Postgraduates: black	65	3.9	398	8.7
Postgraduates: white	239	14.3	472	10.3
Total	1 674	100 .0	4 589	100 .0

Source: DoE 1996–2005

TABLE 9.7: *Proportionate share of graduate numbers, by qualification level and gender, 1996 and 2005*

Qualification	1996		2005		Average annual growth (1996–2005)
	N	%	N	%	%
Certificate/diploma: women	296	17.7	688	15.0	9.8
Certificate/diploma: men	558	33.3	891	19.4	5.3
Degree: women	162	9.7	725	15.8	18.1
Degree: men	354	21.1	1 421	30.9	16.7
Postgraduates: women	86	5.1	262	5.7	13.2
Postgraduates: men	218	13.0	610	13.3	12.1
Total	1 675	100.0	4 598	100.0	11.9

Source: DoE 1996, 2005

It is interesting that three of the smaller sub-fields showed the strongest growth: computer hardware systems, programming systems, and computer operations and operations control reflected average annual growth in graduate output of 20.0 per cent, 17.1 per cent and 13.7 per cent respectively. Notwithstanding its already large share, annual average growth of information and database systems graduates increased by 11.9 per cent.

The number of graduates in programming languages, other computer science and data processing, software methodology, computer hardware, theory of computation, and numerical computations showed negative growth over the seven years. Further research into the factors driving these processes is worth undertaking.

The dynamics of labour demand and labour supply in the field of ICT are quite complex. On the one hand, the fields of knowledge and the kinds of qualifications involving ICT that are offered in HE institutions are overlapping and quite diverse. There is not a direct relationship, for example, between the production of graduates from computer science, and the existence of a particular set of job opportunities only for people with a computer science qualification. An additional factor that contributes to an imprecise relationship between qualifications and job vacancies is substitution. The phenomenon of transferability or mobility of workers between occupations cannot be ruled out in the broad field of ICT.

Thus, to properly understand the broad context of demand and supply among ICT-related occupations, it is necessary to refer to a range of qualifications from study fields that are cognate to computer science which may contribute to supply. Therefore, we have identified several cognate fields of HE study which will contribute to the overall production of high-skill ICT workers. We suggest that changes in the graduate outputs from these study fields could impact on the overall situation regarding demand and supply of high-level ICT-skilled workers.

Other fields of study than those related to computer science and data processing, such as business data systems and computer engineering and technology, may contribute considerably, though unevenly, to the output of ICT-field related graduates into the labour market (Table 9.9). However, at this stage we cannot know how this graduate production impacts on employment and skills shortages.

TABLE 9.8: *Share of graduate production among fields of specialisation in computer science and data processing, 1999 and 2005*

Study field	1999		2005	
	N	%	N	%
Computer Hardware Systems	60	1.8	179	3.9
Programming Systems	115	3.5	296	6.4
Computer Operations & Operations Control	196	6.0	422	9.2
Information & Database Systems	845	25.8	1 656	36.0
Applications in Computer Science & Data Processing	825	25.2	967	21.0
Education, Societal & Cultural Considerations	63	1.9	67	1.5
Programming Languages	417	12.7	404	8.8
Other Computer Science & Data Processing	577	17.6	554	12.1
Software Methodology	49	1.5	45	1.0
Computer Hardware	15	0.5	1	0.0
Theory of Computation	26	0.8	2	0.0
Numerical Computations	83	2.5	4	0.1
Total	3 271	100.0	4 597	100.0

Source: DoE 1996, 2005

TABLE 9.9: *Graduates (percentages), by qualification level in ICT-cognate fields of study, 2005*

Study field	Certificate / diploma	Degree	Postgraduate	Total
Computer Science and Data Processing	36.9	46.7	16.4	100
Computer Engineering & Technology		74.6	25.4	100
Electrical Engineering and Technology	54.7	33.3	12.1	100
Mathematical Sciences	9.0	60.3	30.7	100
Business Data Systems		31.6	68.4	100
Administrative and Office Services	83.9	15.4	0.8	100
Graphic Arts	41.9	58.1		100

Source: DoE 2005

Part three: Supply and demand dynamics

The dynamics of labour demand and labour supply in the field of ICT are quite complex, and therefore it is difficult to determine whether there is a real ICT skills shortage or not. For a start, there is no clear demarcation of ICT work, which is changing continuously, with new ICT occupations developing or others becoming extinct in the context of rapidly emerging and converging technologies. Furthermore, the occupational codes used by Stats SA include a variety of occupations and functions under one code. Migration data are also not readily available that would permit calculation of immigration and emigration figures on the demand side.

On the supply side, the fields of knowledge and the kinds of qualifications involving ICT that are offered in HE are overlapping and quite diverse. There is not a direct relationship, for example, between the production of graduates from computer science and the existence of a particular set of job opportunities only for people with a computer science qualification. An additional factor that contributes to an imprecise relationship between qualifications and job vacancies is substitution. The phenomenon of transferability or mobility of workers between occupations cannot be ruled out in the broad field of ICT. One-in-four graduates in ICT-related fields is employed in work other than an ICT profession or associate profession.

All graduates at South African education and training institutions are also not necessarily South Africans, and foreign graduates return to their home countries on completion of their studies. As a result, output data could be an over-statement of the actual supply from education and training institutions.

It is important to also keep in mind that the pathways to becoming ICT workers are varied. On-the-job training, a qualification obtained at a private or further education and training college, or one obtained at an HE institution can all be stepping stones towards becoming an ICT worker.

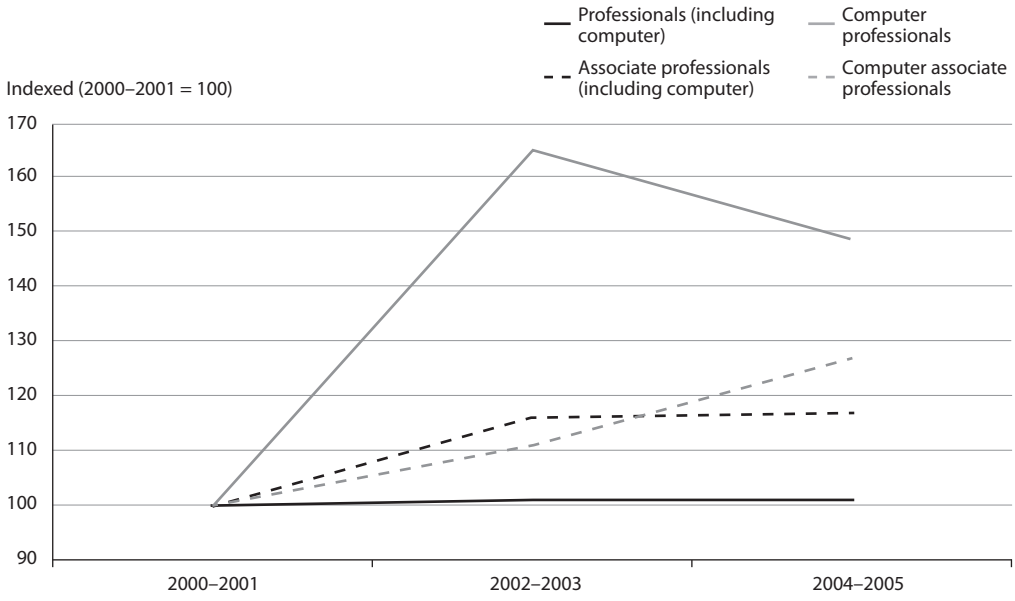
Finally, the rapidly changing technology environment results in knowledge becoming quickly outdated, and it becomes a challenge to match training and supply with demand in the labour market.

Notwithstanding these challenges, data analysis indicates a probable ICT skills shortages. The fact that a marked increase in proportions of professionals with high skills took place over the 2000–2005 period suggests that the education and training supply-side institutions did contribute substantially to raising skill levels among professionals. However, this does not necessarily mean that complaints about an ICT skills shortage were unfounded. The relatively large proportion of intermediate-skilled workers in the computer professional category, and the high proportion of low-skill workers in the computer associate professionals category, indicate that a shortage was in evidence in the second period.

The increase in remuneration of ICT professionals and associate professionals relative to compensation for other professionals and associate professionals can be a further indication that demand exceeds supply (Figure 9.5). Remuneration, however, can also increase as a result of productivity, and the remuneration of other professionals and associate professionals can be low as a result of poor salaries in some categories such as nurses and teachers.

Our projection indicates that a shortage will be experienced in the future if graduate output does not increase. In Table 9.10, the HE computer science and data processing graduate supply is compared to the demand for CPAPs and ICT managers arising from new demand over the period 2005–2015.

FIGURE 9.5: *A comparison of changes in remuneration between all professionals and all associate professionals and ICT professionals and associate professionals, 2000–2005*



Source: Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005)

If *ICT managers are included* (Scenario 1), a shortage of 29 027 CPAPs is predicted by the model over the decade.

If *ICT managers are excluded* (Scenario 2), a shortage of 9 679 CPAPs is predicted by the model over the decade.

The most important element to bear in mind is that the labour market environment is highly complex and there is no simple and direct interaction between supply and demand. It is also important to bear in mind that each method used to obtain a sense of how the labour market is behaving must be understood as limited, and should be considered in the light of other data and interpretations.

According to vacancies as advertised in Career Junction over three years (2005–2007), almost a quarter (24.5 per cent) of vacancies were for ICT workers, 20.1 per cent for financial positions, 8.4 per cent for engineering positions, and lower percentages for vacancies in other positions which could also be an indication of a demand for ICT workers.[2]

In looking at current employment, 5.1 per cent of *all professionals* are computer professionals. Therefore, a 4.4 per cent vacancy rate for computer professionals among all professionals (Erasmus 2008) could indicate that a shortage of computer professionals is experienced. The survey of vacancies reveals that vacancies for ICT professionals were predominantly for business/systems analysts and programmers, ICT network and support professionals, and then also for database and systems administrators, which includes security specialists (Erasmus 2008).

2 Career Junction, Monthly statistics of job adverts on Career Junction from 2005 through to 2007. MS Excel spreadsheets supplied to the authors on request, 21 January 2008

TABLE 9.10: *Comparison between the total number of positions that need to be filled to address demand for ICT workers and output of new graduates, 2005–2015*

Scenario 1		Year	N
A	ICT workers including managers[a]	2005	62 388
B	ICT workers including managers[b]	2015	64 811
C (B – A)	Growth in demand for ICT workers		2 423
D	Demand arising from death and retirement[c]		69 685
E	Demand arising from emigration[d]		21 344
F (C + D + E)	Total number of positions that need filling		93 452
	Total number of new graduates[e]		64 425
	Shortage		29 027
Scenario 2		Year	N
A	ICT workers (excluding managers)[f]	2005	49 688
B	ICT workers (excluding managers)[g]	2015	51 618
C (B – A)	Growth in demand for ICT workers		1 930
D	Demand arising from death and retirement[h]		55 174
E	Demand arising from emigration[i]		16 999
F (C + D + E)	Total number of positions that need filling		74 103
	Total number of new graduates[j]		64 425
	Shortage		9 679

Source: a–d. Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005) and calculations by authors; e. authors' calculations based on HEMIS data over the period 1996–2005 (DoE 1996–2005); f–i. Quantec 2007 (Stats SA OHS data for 1996–1999; Stats SA LFS data for 2000–2005) and calculations by authors; j. authors' calculations based on HEMIS data over the period 1996–2005 (DoE 1996–2005)

It seems as if there is more of a shortage for computer associate professionals than for computer professionals, as 9.7 per cent of vacancies among *all* associate professionals were specifically for *computer associate professionals* (Erasmus 2008). Current employment reveals that only 1.2 per cent of *all* associate professionals are *computer associate professionals*. The demand for computer associate professionals is thus higher than the current employment in proportion to other associate professionals.

Our survey of vacancies further reveals that the demand for ICT managers is not as high as that for CPAPs. Only 1.2 per cent of all managerial vacancies was in ICT management (Erasmus 2008), while 14.3 per cent of all managers that are currently employed are ICT managers. It must, however, be kept in mind that ICT managers are usually being headhunted.

The literature cites various skills shortages, but ICT managerial skills and business skills to co-ordinate various processes and systems seem to be an important overarching shortage that impacts on other ICT skills shortages. It is, for instance, argued that business skills need to be acquired first, before ICT-related qualifications are pursued. In line with this argument, our survey of employers also indicated

that relatively low proportions of the total numbers of applicants were considered suitable for vacant positions (Erasmus 2008).

Conclusion

Our projection model indicates that a shortage will indeed be experienced in the future if graduate output does not increase. A greater ICT shortage will be experienced as a result of a demand for ICT managers. ICT managerial skills, however, require not only training and education but also experience, which is hard to come by.

A prominent argument is made to the effect that a gap exists between the skills sought by employers and those found in the workforce, mainly because of rapidly changing skills requirements. However, these conditions may be exacerbated by sectoral growth. In other words, even if skills needs driven by technology change were taken care of, economic growth in ICT-using sectors would in its own right add further pressure for skills such as business and managerial skills.

Finally, the role of knowledge workers and information workers will become increasingly significant, and the demand for these skills will grow, as the diffusion of ICT throughout all sectors will increasingly require ICT skills.

References

DoE (Department of Education, South Africa) (1996–2005) *Higher Education Management System (HEMIS) annual databases*. Pretoria: DoE

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Commissioned by the Department of Labour, Pretoria

Hamdy AT (2006) *Operations research: An introduction*. Eighth edition. Cambridge: Prentice Hall

Moleke P, Paterson A & Roodt J (2003) ICT and associated professionals. In *Human resources development review 2003: Education, employment, and skills in South Africa*. Cape Town: HSRC Press

Quantec (2007) *RSA Regional indicators database*. Accessed September 2007, www.quantec.co.za/data

Roodt J (2003) *Survey of industry standard courses in information and communication technology*. Pretoria: HSRC

Stats SA (Statistics South Africa) (1996) Manpower survey. Pretoria: Stats SA

Stats SA (2005) *South African standard classification of occupations (SASCO)*. Pretoria: Stats SA

CHAPTER 10

Educators

Thobeka Mda

This study on scarce and critical skills in education is part of a larger study by a Human Sciences Research Council (HSRC) team to ascertain the nature and extent of scarce skills needed in South Africa. The case of educators is one of 12 case studies of selected professions/occupations regarded to be experiencing skills shortages.

Two HSRC studies both look at the demand for teachers: i) a multiple source identification and verification of scarce and critical skills in the South African labour market (Mda & Erasmus forthcoming); and ii) a study by the Teacher Education Project (TEP) (Arends & Chisholm forthcoming). The first study, out of which this chapter arose, also examines the supply of teachers. Of importance to this chapter is that both studies conclude, firstly, that deficiencies, inconsistencies and contradictions in and between the databases preclude any definitive conclusions about teacher demand on the basis of these databases alone, but that it is clear that the issue is primarily distributional rather than a question of the existence of any absolute shortages. Secondly, the studies conclude that the priority lies in improving teacher quality.

For the purposes of this study, the term 'educators' will be limited to those who impart knowledge or educate in the schooling system. The two terms, 'educators' and 'teachers', will therefore be used interchangeably.

The discourse on skills – identification, shortage, development – has, until recently, excluded educators and the education profession. In fact, it may still be argued that educators and the education profession do not belong in this discourse. This argument is based on the view that educators are professionals, while 'skill' is associated with mechanical tasks and occupations; it may in turn be dismissed as being based on a very narrow view of skills and professionals. The questioning of whether educating or teaching is a skill may further be accused of elitist leanings, whereby a profession is characterised as implying formal education – associated with mental capabilities – while mechanical occupations are associated with handwork and training, which may simply require drilling in specific actions, and unthinking, reflex actions.

A dictionary definition of 'professional' includes words such as 'specialist', 'expert' and 'skilled'. The implication therefore is that a professional is assumed to have the necessary skills of the profession, or, put the other way, that being skilled is embedded in expertise and professionalism. Skill is described as ability, expertise, proficiency, aptitude and competence, all words that are clearly applicable to educating or teaching, although some dictionary synonyms of skill, such as 'dexterity' and 'handiness', may be associated with mechanical occupations, and not really seem applicable to educating.

In this study, skill is defined as an ability, expertise, proficiency, aptitude and competence in doing something well, usually gained through training or experience.

The question of scarce skills in the education profession arises in the context of skills shortages in South Africa. The importance of production of sufficient skilled students and workers addresses the 'growing demand for technically qualified personnel required to keep the economy on a strong growth trajectory'.[1] This discourse on raising the level and increasing the quantity of skills in South Africa features at the top of the priority lists of the Ministries of Labour, Science and Technology, Trade and Industry, Education, and the deputy president's Accelerated and Shared Growth Initiative for South Africa (Asgisa) programme and Joint Initiative on Priority Skills Acquisition (Jipsa) (The Presidency 2006a, 2006b), and has received attention in the minister of finance's budget speeches (Manuel 2008).

The skills shortage in South Africa is directly related to the quality and quantity of education provided to the majority of South Africans, especially in the past. The shortage reflects the type of education that was made available to the majority, the exclusivity of quality education for a few, and the general lack of access to education for many.

The concepts of absolute and relative scarcity, as defined in the definitions and classification of scarce and critical skills by the Department of Labour (DoL) (DoL 2007: 62), are relevant for our study. Scarcities in the education profession can be argued to cover both absolute and relative scarcity. In some areas of the profession, the scarcity can be seen as absolute, in that the lack of skilled education professionals prevents implementation of planned growth strategies and results in quality problems. However, it can also be shown that most scarce and critical skills in the education profession fall under the concept of relative scarcity: scarcity pertaining to geographical location, equity considerations and replacement demand. Nonetheless, while the scarcity of the skills might be relative, the skills may still be critical if they are 'key, generic or fundamental…such as cognitive skills…language and literacy skills, mathematical skills, ICT skills…' (DoL 2007: 63) as these particular skills are fundamental in the education profession.

Who says there is a shortage of teachers in South Africa?

Accounts of teacher shortages abound in government and national media statements. There are regular reports in the print and electronic media that rural schools and disadvantaged communities have great shortages of teachers, especially qualified (and quality) teachers. During teacher mass demonstrations, and through statements by teacher union leaders, teachers complain of having overcrowded classrooms, which implies a shortage of teachers. The South African Democratic Teachers Union (SADTU), the biggest union in the public service and biggest teachers' union in South Africa, consistently argues that there are shortages of teachers, based on members' experience of large classes,[2] whereas the Department of Education (DoE) and DoL, using data sets, consistently argue that there are no teacher shortages, but nonetheless agree that there are skill issues that need to be addressed. What these skill issues are, is the question.

At the launch of Jipsa in March 2006, the deputy president of South Africa also highlighted the question of teacher shortages. On this occasion, she promised that the Jipsa project would support poor schools and increase 'efforts to support maths, science and English language skills in schools' (South

1 Merit in incentives for teachers, *Education Herald, The Herald* 8 February 2006
2 Bell T, Thousands more needed at blackboards: Statistics are, however, no surprise, *The Star* 9 November 2007

African Government Information 2006). She said that Jipsa would also be focusing specifically on teachers of these subjects.

A number of agencies have identified where critical teacher shortages lie, in the process of identifying skills in short supply. The skill that is seen as most scarce is that of teachers of specific subjects, especially mathematics and science. Thus, for example, when the Education Training and Development Practices Sector Education and Training Authority (ETDP SETA) submitted its updated Sector Skills Plan (SSP) on 30 November 2006, it included in its list of scarce and critical skills 'School teachers: Maths', 'Early Childhood (Preprimary school teachers)', 'School teachers: Natural sciences', 'School teachers: Technology (includes ICT)', 'School teachers: Languages', 'Special Needs teachers' and 'School teachers: Economic and Management Sciences' (ETDP SETA 2006). In the list of postgraduate scarce skills compiled by the National Research Foundation (NRF), out of the 18 identified areas, 13 were from the natural sciences (for example, actuarial sciences, biotechnology, engineering, information systems, mathematical sciences, microbiology) (NRF 2002). The 2006 National Scarce Skills List identified the following as in short supply: early childhood workers; school teachers: mathematics, science; and, as in the NRF list, higher education lecturers in natural sciences such as engineering, astronomy, marine biosciences, African origins and physics (DoL 2006).

The Ministry of Education is investing in educating more mathematics, science and technology (MST) teachers, and in equipping schools to offer these subjects and improve performance of learners in them. This ministry has also announced that it is planning to introduce a programme that will see MST teachers being paid higher salaries than their counterparts who are offering subjects not seen as critical, or (by implication) subjects where there is an over-supply of teachers.

While language skills, and especially English-language skills, are critical, their scarcity has not attracted the same attention as the scarcity of skills in mathematics and science.

There is a significant and large body of articles, columns and commentaries in the media on skills shortages in education. While some of these can be classified as sensationalist writing, the regularity of these writings does reflect the passion and great concern of the public about the state of education in the country. The media and unionists regularly report on classrooms where there are 50 : 1 and higher teacher-learner ratios. In these statements, actual numbers of teachers needed are given (for example, statements in various media in January 2008). The figures may be given in terms of provinces, grade levels, or urban versus rural situations. For instance, an HSRC study (Paterson & Arends 2007) was cited as reporting that South Africa needs 30 000 new teachers every year, but only slightly more than 5 000 had graduated in 2006.[3]

Comparisons are also made by juxtaposing the loss of educators (through HIV/AIDS, changes in careers, and migration of teachers to other countries and continents), with the number of teachers who enter the profession every year. The verdict seems to be that the scales are weighted more heavily on the side of the former than the latter.

Is there actually a shortage? What do the available data tell us?

Considering whether there actually is a shortage of teachers means looking at perceptions versus reality. There is a need to interrogate the interpretation of 'scarcity' and 'shortage'. As stated above, there does not seem to be any absolute shortage of teachers. Evidence from research and various databases suggests that, in terms of numbers, there may be enough teachers in South Africa, but that there is a

3 Bell T, Thousands more needed at blackboards: Statistics are, however, no surprise, *The Star* 9 November 2007

problem related to distribution according to geographic areas, provinces, regions/districts, grade levels, subjects, qualifications, skills, quality, race and language. This section of the chapter, using available data, illustrates what seems to be the fallacy that there is a shortage of teachers.

While there are official figures from government data sources such as the Education Management Information System (EMIS) and the Personnel and Salary Information System (PERSAL), these are variously viewed by researchers in the field as problematic and not reliable (Peltzer et al. 2005: 32–3). One therefore has to cross-check figures from various databases, for example, the database of the South African Council for Educators (SACE), the DoE's Higher Education Management Information System (HEMIS), the Labour Force Survey (LFS) prepared by Statistics South Africa (Stats SA) and the National Learners' Records Database (NLRD) of the South African Qualifications Authority (SAQA).

Learner-educator ratios

The number of educators needed in South Africa is informed by the need to maintain predetermined levels of educators relative to the learner population. The current target of the DoE is 1 educator for every 40 learners in ordinary primary schools and 1 educator per 35 learners in ordinary secondary schools (DoE 2005: 35). It is generally accepted that the lower the learner-to-educator ratio (L-E-R), the more contact an educator may have with a learner during the learning and teaching process.

In its report, *Teachers for the future: Meeting teacher shortages to achieve education for all*, the DoE acknowledged that 'research on teacher demand and supply has indicated no quantitative shortages at the present time' (DoE 2005: 9). This assertion is supported by analyses of figures from the various databases used in this chapter for educator numbers in relation to learners, which indicate that there is currently an over-supply of educators in South Africa.

If the national figures published in *Education statistics in South Africa at a glance 2005* (DoE 2006a: 19) are used, and the targeted L-E-R is applied, then there was a surplus of 49 707 educators in the ordinary public schooling system of South Africa in 2005 (Table 10.1). If educators and learners from ordinary private schools are added to the equation, then there was a surplus of 60 487 educators in the country in 2005.

If the same calculations are applied to 2006 figures published in the DoE's *2006 School realities* information sheet (DoE 2006b: 1), and an across-the-board L-E-R of 38 : 1 is used, then the surplus becomes 52 394 educators in public schools and increases to 62 852 if private schools are included.

In 2005, the national average L-E-R at ordinary public schools in the country was 32.8, ranging by province from 29.7 in the Free State to 34.4 in KwaZulu-Natal (DoE 2006a: 18–19). In between were Limpopo with 34.1 learners for every educator in the province, Mpumalanga with a ratio of 33.6 : 1, the Eastern Cape with 33.0 : 1, the Northern Cape with 31.9 : 1, Gauteng with 31.6 : 1, the Western Cape with 31.5 : 1 and North West with 31.1 learners for every educator.

According to the DoE (2006a: 15), the national L-E-R stayed fairly consistent between 2001 and 2004, but decreased between 2004 and 2005, due to the fact that all school governing body (SGB)-paid educators at public schools were included for the first time in 2005. Six provinces (the Eastern Cape, the Free State, Gauteng, KwaZulu-Natal, Mpumalanga and the Western Cape) showed a decrease in L-E-R from 2001 to 2005, while Limpopo, the Northern Cape and Mpumalanga indicated an increase.

From 2005 to 2006, the national average L-E-R at ordinary public schools in South Africa and in some of the provinces stayed relatively constant (a net increase or decrease of one percentage point or

TABLE 10.1: *Comparison of the number of educators needed according to the targeted learner-to-educator ratio and the number of educators reported in the 2005 SNAP Survey*[a]

	Learners	Educators needed	Targeted L-E-R[b]	Reported educators[c]	Reported L-E-R	Surplus
Ordinary public schools						
Primary	7 588 987	189 725	40	224 439	33.8	34 714
Secondary	3 769 255	107 693	35	120 377	31.3	12 684
Combined	385 018	11 001	35	12 857	29.9	1 856
Intermediate	159 056	4 544	35	4 997	31.8	453
Total	11 902 316	312 963	38	362 670	32.8	49 707
Ordinary independent schools						
Primary	92 337	2 308	40	4 518	20.4	2 210
Secondary	59 450	1 699	35	3 570	16.7	1 871
Combined	163 662	4 676	35	11 375	14.4	6 699
Intermediate	0	0	0	0	0.0	0
Total	315 449	8 683	36	19 463	16.2	10 780
All ordinary schools						
Primary	7 681 324	192 033	40	228 957	33.5	36 924
Secondary	3 828 705	109 392	35	123 947	30.9	14 555
Combined	548 680	15 677	35	24232	22.6	8 555
Intermediate	159 056	4 544	35	4 997	31.8	453
Combined total	12 217 765	321 646	38	382 133	32.0	60 487

Source: DoE 2006a: 19

Notes: a. The SNAP Survey is a headcount survey conducted on the 10th school day of the new school year.
b. L-E-R = learner-to-educator ratio
c. Reported educators included all school governing body (SGB)-paid educators at public schools.

less between 2005 and 2006). The highest net increase between 2005 and 2006, namely 6.6 per cent, occurred in Gauteng. Other provinces that showed increases include Mpumalanga (2.7 per cent) and the Eastern Cape (1.0 per cent). Ordinary public schools in six of the provinces indicated a net decrease in their L-E-Rs. The provinces' L-E-R decreases, from the highest to the lowest percentage, are: North West (–5.3 per cent); KwaZulu-Natal (–4.5 per cent); Limpopo (–2.2 per cent); the Western Cape (–1.4 per cent); the Free State (–0.7 per cent) and the Northern Cape (–0.3 per cent).

Despite the DoE's (2005: 35) 'successes in reducing class sizes in historically disadvantaged schools,' it expressed distress (2005: 46) about the uneven distribution of educators across the provinces and specifically worried about rural areas that experience quantitative shortages.

According to the DoE's (2006b) *School realities,* there are proportionally more educators deployed in the Western Cape, the Northern Cape, North West, Gauteng and in the Free State compared to the national distribution of learners. It is indeed the more rural provinces such as Mpumalanga, Limpopo, KwaZulu-Natal and the Eastern Cape in which educators are under-represented.

The fact, however, that there are proportionally fewer educators in some provinces than in others does not necessarily mean that there is a shortage of educators in these provinces. If the targeted ratios of 40 : 1 for primary schools and 35 : 1 for secondary schools are applied to the number of learners and educators who were in the ordinary school sector, then all provinces had a surplus of educators in 2005 (DoE 2006a).

If the current ratios of 35 : 1 for primary schools and 30 : 1 for secondary schools are applied to the number of learners and educators who were in the ordinary school sector, then KwaZulu-Natal, Limpopo and Mpumalanga had a shortage of educators in 2005 (DoE 2006a). Still, overall, there was a surplus of about 13 000 educators in the country.

Although the Eastern Cape showed a surplus of educators in 2005, if the current ratios of 35 : 1 for primary schools and 30 : 1 for secondary schools are applied to the number of learners and educators who were in the ordinary school sector, there were six districts with educator shortages in 2005. Yet, Eastern Cape had a surplus of 1 118 teachers. It is only in KwaZulu-Natal, Limpopo and Mpumalanga

TABLE 10.2: *Number of educators needed at targeted learner-to-educator ratio compared with number of educators in ordinary schools, by province, 2005*

	Learners			Educators				
Province	Primary	Secondary	Total	Primary[a]	Secondary[b]	Need	Have	Surplus
Eastern Cape	1550 900	654 004	2 204 904	38 773	18 686	57 458	67 230	9 772
Free State	405 442	263 482	668 924	10 136	7 528	17 664	23 400	5 736
Gauteng	1 064 806	676 617	1 741 423	26 620	19 332	45 952	60 121	14 169
KwaZulu-Natal	1 720 347	994 784	2 715 131	43 009	28 422	71 431	80 979	9 548
Limpopo	1 154 178	751 290	1 905 468	28 854	21 465	50 320	56 160	5 840
Mpumalanga	571 819	341 825	913 644	14 295	9 766	24 062	27 701	3 639
North West	528 097	317 163	845 260	13 202	9 062	22 264	27 454	5 190
Northern Cape	134 992	74 741	209 733	3 375	2 135	5 510	6 641	1 131
Western Cape	622 706	356 802	979 508	15 568	10 194	25 762	32 447	6 685
National (Total)	7 753 287	4 430 708	12 183 995	193 832	126 592	320 424	382 133	61 709

Source: Calculated from DoE 2006a Table 7, pages 17, 20–21

Notes: a. L-E-R = 40 : 1
b. L-E-R = 35 : 1

that shortages in districts resulted in an overall shortage in each province, once the 35 : 1 and 30 : 1 ratios were applied.

Notwithstanding the evidence above of sufficient educators numerically, the uneven distribution of educators across provinces is cause for concern. This is a pattern in all professions across the provinces. There is reluctance on the part of all professionals, educators included, to go to the rural areas to work, and so professionals are concentrated in the urban areas. The Report of the Ministerial Committee on Rural Education of 2005, cited in the 2007 National Policy Framework for Teacher Education (RSA 2007: 5), confirms the imbalance between urban and rural schools:

> [The Report] noted a shortage of qualified and competent teachers in these schools, problems of teaching in multi-grade and large classes, under-resourced school facilities, and limited access to professional development programmes for teachers.

Gender

In terms of gender balance among educators, the 2005 gender distribution of educators showed that women dominated the profession with respect to numbers (DoE 2006a: 20–21). According to the DoE

TABLE 10.3: *Number of educators needed at current learner-to-educator ratio compared with number of educators in the ordinary school sector, by province, 2005*

	Learners			Educators				
Province	Primary	Secondary	Total	Primary[a]	Secondary[b]	Need	Have	Surplus
Eastern Cape	1 550 900	654 004	2 204 904	44 311	21 800	66 112	67 230	1 118
Free State	405 442	263 482	668 924	11 584	8 783	20 367	23 400	3 033
Gauteng	1 064 806	676 617	1 741 423	30 423	22 554	52 977	60 121	7 144
KwaZulu-Natal	1 720 347	994 784	2 715 131	49 153	33 159	82 312	80 979	−1 333
Limpopo	1 154 178	751 290	1 905 468	32 977	25 043	58 020	56 160	−1 860
Mpumalanga	571 819	341 825	913 644	16 338	11 394	27 732	27 701	−31
North West	528 097	317 163	845 260	15 088	10 572	25 661	27 454	1 793
Northern Cape	134 992	74 741	209 733	3 857	2 491	6 348	6 641	293
Western Cape	622 706	356 802	979 508	17 792	11 893	29 685	32 447	2 762
National (Total)	7 753 287	4 430 708	12 183 995	221 522	147 690	369 213	382 133	12 920

Source: Calculated from: DoE 2006a Table 7, pages 17, 20–21

Notes: a. L-E-R = 35:1
b. L-E-R = 30:1

(2006a: 21), there were 256 782 female educators in the ordinary school sector in 2005. Based on this figure, female educators constituted 67.2 per cent of the 382 133 educators in the country. The DoE reports that attempts to attract male candidates into the teaching profession are failing (DoE 2005: 43).

According to SAQA (2007), 51.3 per cent of the education qualifications awarded in 1995 at National Qualifications Framework (NQF) Level 6, 60.4 per cent of qualifications at NQF Level 7 and 48.3 per cent of qualifications at NQF Level 8 went to women. These rates increased substantially in 2004 (31.8 per cent at Level 6, 11.2 per cent at Level 7 and 11.3 per cent at Level 8). In 2004, 83.1 per cent of the education qualifications awarded at NQF Level 6, 71.6 per cent of qualifications at NQF Level 7 and 59.6 per cent of qualifications at NQF Level 8 went to women.

Although this is a world-wide trend, the growing dominance of female educators concerns the DoE (2005: 42) because it is indicative of 'an inadequate presence of male role models in the field of teaching'. The feminisation of the profession and the small numbers of male teachers may also be contributing to students' behavioural problems currently experienced in schools.

While female educators dominate the teaching profession, women are under-represented in management positions, especially in secondary schools. According to the DoE (2005: 43), it is only the 'pre-primary schools and primary schools [that] are largely under the managerial responsibility of women'.

Age

According to the DoE (2005: 45), only a fifth of 375 000 or 'twenty-one per cent of all South African teachers were under the age of 40' in 2004. A recalculation of the number and distribution of educators by age group published by the DoE (2005: 45) shows that 57.0 per cent of the educators were 41 years or younger in 2004. According to Arends (2007), 47.9 per cent of all educators were 40 years or younger in 2005. A further 37.2 per cent fell within the 41–50-year-old age group and 14.0 per cent within the 51–60-year-old age group.

According to Stats SA, the mean age for all graduates in the field of education and the mean age for practising educators was 41 in 2005 (Stats SA 2006). This is not significantly older than the mean age of 38 for all employed people in 2005 who had obtained a certificate/diploma or higher qualification. The Stats SA figures also show that the mean age for unemployed graduates in the field of education was 35 in 2005.

According to Crouch (cited in Arends 2007), there are two reasons for the small proportion of 21–30-year-old practising educators: (i) more qualified and experienced educators tend to stay in the teaching profession; and (ii) the young, less qualified, leave the profession too soon. A third reason may be that there is no 'space' in the ordinary school system for new graduates, forcing them to find employment elsewhere or to stay unemployed. The DoE (2005: 13) confirms this possibility in saying that 'newly trained educators have difficulty in finding posts (even in rural schools)'.

While the age profile of teachers does not point to teacher shortages, it is of concern that new graduates may be kept out of the profession because there is no space for them. Also, if we consider that the mean age for practising educators was 41 and that only 5.4 per cent (or 19 783) of all practising educators were under the age of 30 in 2005, it can be assumed that only the latter (5.4 per cent of educators) had been prepared in their teacher education for Curriculum 2005 and its later revisions. The implication is that the majority of educators were not prepared for the new curriculum, and in many cases did not have the skills needed to interpret and implement a new curriculum.

Qualification levels of practising educators

In terms of the Norms and Standards for Educators, published in 2000, educators who had obtained a three-year post-school qualification (Relative Education Qualification Value (REQV)[4] 13 level) were regarded as adequately qualified (DoE 2005: 47). The 2007 National Policy Framework for Teacher Education, however, has set the minimum entry level for all new educators joining the teaching profession at REQV 14 level. The two recognised pathways are: i) the four-year professional Bachelor of Education (BEd) degree; and ii) a three-year junior degree followed by a year's study for a postgraduate diploma (RSA 2007: 13–14). Less than half (47.9 per cent or 171 976) of 359 260 educators had an REQV 14 qualification in 2004 (DoE 2005: 48). A further 37.4 per cent (or 134 509 educators) had an REQV 13 level qualification. Only 14.7 per cent (or 52 775 educators) could be regarded as under-qualified because they had an REQV 12 or lower qualification.

Although 14.7 per cent is a small percentage, it is still of concern that in 2004 more than 50 000 teachers were still under-qualified. It is not clear at this stage how much of a dent in this total the National Professional Diploma in Education (for upgrading under-qualified teachers) has made, as the programme is still continuing.

The number of education graduates has more than doubled over 10 years. In 1994, there were 85 220 graduates in the field of education. By 2004, there was a total of 184 827 graduates captured on the NLRD who had achieved an NQF Level 6–8 qualification in the field of education.

If it is considered that 524 159 of the 610 262 education graduates were employed (Stats SA 2006), then there were 86 103 people left in the 'pool of available education graduates' who could have been recruited for employment if there was a crisis in 2005. The mean age for the 63 082 not economically active education graduates was 48 – higher (older) than the mean age (40) of all not economically active graduates and significantly higher than the mean age (30) of the potential labour force. It is therefore doubtful if the older education graduates will be interested in employment, especially if it means they have to be re-skilled (that is, in new curricula and new classroom realities).

The figures above imply that the country had a total of 23 021 graduates in the field of education who were actively looking for a job and who could have been employed if there was a dismal shortage of educators in 2005. The mean age for unemployed education graduates was 36, significantly higher than the mean age (29) of all graduates, and the mean age (30) of all unemployed people. Notably, the mean age for education graduates was, at 41, somewhat higher than the mean age of 38 for all graduates. What the databases do not reveal about the unemployed education graduates is what subjects they were offering, at which school level they were qualified to teach, and the geographical areas in which they were seeking employment.

Education enrolments

The number of students enrolled in initial teacher education programmes sustains the flow of new entrants into the profession (DoE 2005: 68). An analysis of HEMIS data shows that on average a total of 14 386 students started their studies for the first time in the field of education every year at higher education institutions over the period 1996–2005. More than 140 000 students enrolled in education over the 10 years. First-time enrolments in the field of education averaged 12 213 students in the first

4 The REQV is a relative value attached to an education qualification that is based primarily on the number of recognised prescribed full-time years of study. Matriculation value is REQV 10. All honours, master's and doctoral degrees have a REQV level of 15 and above. Higher diplomas and bachelor's degrees have a REQV level of 14. All diplomas are at REQV level 13. Educators are considered to be unqualified or under-qualified if they have a qualification resulting in level 10, 11 or 12, that is, less than 3 years study after matric.

5 years of the 10-year period 1996–2005, but increased to an average of 17 048 over the last 5 years (2001–2005).

First-time enrolments in the field of education showed a compound annual growth rate of 3.9 per cent over the 10-year period. This figure differs considerably across the respective levels of qualifications. About a 10 per cent compound annual growth rate was registered for undergraduate certificates/diplomas or National Higher Diplomas, for professional bachelor's degrees (including BTech degrees) and for master's degrees. There was a compound decline of –11.9 per cent in enrolments in bachelor's degrees. This decline specifically occurred after the minimum entry level for all new educators joining the teaching profession was set at a four-year professional degree by the Norms and Standards for Educators, published in 2000 (DoE 2005).

There was exceptional growth in the number of enrolments in professional bachelor's degrees (including BTech degrees) in 1999, but two years of negative growth in enrolments followed. The year 2002 showed a compound annual growth rate of 25.7 per cent. This also coincided with the incorporation of colleges into universities, which started in 2001. Although growth was registered for the following three years, the growth was slowing down considerably, reaching a compound annual growth rate of only 3.9 per cent by the end of the period in 2005.

An explanation for the growth in numbers of students registering in higher education institutions in 2002 seems to be the incorporation of teacher training colleges. When the teacher colleges were incorporated, college students were therefore transferred (as pipeline college students) to the receiving universities (RSA 2000).

A (HEMIS) comparative analysis (1996 versus 2005) of the race and gender distribution of all students entering higher education institutions for the first time in the field of education shows relative stability in enrolment across the four population groups. A different picture emerges if the race and gender distribution of only those students that entered a professional bachelor's/BTech degree and postgraduate certificate/diploma for the first time in the field of education is considered. The share of African first-time enrolments declined considerably, while the share of white first-time enrolments almost doubled in 2005 compared to 1996 (DoE 2007). Increases occurred particularly among white female enrolments, but also among coloured and Indian female first-time enrolments. There was a decline of 12.2 per cent among African female first-time enrolments.

It has also been noted that once former colleges of education were closed or incorporated into universities in 2001, the numbers of black (that is, African, coloured and Indian) students trained as teachers decreased significantly. Some of the possible reasons for this decline are:

- Bursaries were available to all teacher education students at colleges of education. The closure of the colleges must have excluded a significant group that could not pay for higher education.
- Most black colleges admitted even students with low and very poor matric passes to train as teachers. It could be, therefore, that the majority of black students who went to the colleges were students who did not have university entry qualifications in their matric pass and had gone to the colleges because that was where they were admitted, in which case they now do not qualify for admission since all teacher education is now offered at university level.

The issue of the decreasing number of black students registering for teacher education needs some research.

Implications of race distribution

There are more black schools than white schools because of the demographics of the country. It follows, therefore, that if there is a need for teachers, the need will be felt more in black schools than in white schools. Further, as suggested by HEMIS data, most under-qualified and unqualified teachers are in the African group. Yet, the studies report a drop in the number of Africans enrolling for initial teacher education.

Also, the highly qualified teachers, who may also be white, in most cases live in the cities and city suburbs, and are unlikely to leave the schools and cities with better facilities, access to opportunities for professional development and career ladders, for the impoverished rural and township areas.

South African apartheid history has contributed to the critical skills shortage of qualified teachers being racially based. Apartheid created inequalities amongst races by, for example, offering unequal education to different race groups, and, as a result, the quality of teachers has always been very uneven across the racial groups. Because of that legacy, on the whole, white schools are still better equipped than black schools and therefore attracting better-quality teachers than black schools. White schools' governing bodies are also able to employ and pay more educators.

For those who might question (and some critics do) that more than 10 years after the official end of apartheid, we are still attributing the causes of the low quality of the majority of black teachers, and shortage of qualified and competent black teachers, to apartheid, there is a need for studies which will focus on the links between the discriminatory apartheid system and the current education system's inequalities. Lamberti, cited in Kane-Berman (2007: 1), states: 'Apartheid's most devastating and enduring legacy was that it destroyed the human capital of our nation.' Kane-Berman (2007: 1) further claims, 'Although South Africa has some excellent private and government schools, it will take a generation to fix the rest.'

How many new teachers?

The Education Deans' Forum has estimated that education institutions produced about 9 000 graduates in 2004 towards teacher supply, of whom at least 3 000 may already have been practising educators (Morrow 2007). This means that only 6 000, or 20.6 per cent, of a total of 29 361 students who graduated in the field of education in 2004, could be considered as new supply to the profession (DoE 2006a, 2007).

According to the DoE's Committee on Teacher Education, the total (1st-, 2nd-, 3rd- and 4th-year) Initial Professional Education for Teachers' (IPET) enrolments in the field of education increased from 22 119 students in 2005 to 32 981 students in 2007 (Morrow 2007). The number of students who were expected to complete their IPET studies was predicted to increase from 5 322 in 2005 to 7 392 in 2007 (Morrow 2007). Note that around a fifth of all registrations are considered as possible new teacher supply.

Two scenarios for the future supply of teaching skills can be calculated from trends observed in HEMIS data and from the data provided by Morrow. In the first scenario, the status quo is maintained and no provision is made for interventions to increase the number of enrolments. If the compound annual growth rate of 3.9 per cent (HEMIS data in DoE 2006a; Morrow 2007) for enrolments in the professional bachelor's/BTech degree in the field of education is used to project the number of new teachers over the next five years (2008–2012), then an estimated 34 744 can be produced. In the second scenario, if the compound annual growth rate of 17.9 per cent registered over the 3 years reported by Morrow

TABLE 10.4: *University education registrations per phase, 2006–2007*

	2006		2007	
	N	%	N	%
Foundation phase	6 215	22.7	7 002	21.8
Intermediate phase	3 648	13.3	3 523	11.0
Senior phase	5 259	19.2	7 446	23.2
Further education and training	12 281	44.8	14 102	44.0

Source: Calculated from data supplied by Morrow (2007).

(2005–2007) is applied to calculate projections of future IPET completions, then an estimated 63 430 new teachers could be produced over the next 5 years.

Morrow also provides teacher supply data (2007) from South African universities' registrations per phase (see Table 10.4): foundation phase (FP), intermediate phase (IP), senior phase (SP) and further education and training (FET).

According to the registration figures in Table 10.4, Arends (2007) and Arends and Chisholm (forthcoming), the supply of skills to the education profession is increasing. More educators are qualified, and to higher levels, and a large number of the educator workforce participates in some form of formal training every year. Further expansion in the stock of skills is probable, given the targets currently in place for increased participation in higher education.

Teacher attrition

According to the DoE (2005: 54), the teacher attrition rate is currently estimated at between 5 and 5.5 per cent nationally, which in absolute terms translates to between 17 000 and 20 000 teachers lost to the system each year. While it cannot be denied that many teachers will leave the profession if a better career opportunity comes along, it does seem as if there is currently a large enough pool of educators to fill in for those who leave. There was a decline in the number of educators in the ordinary school system between 1999 and 2001 (a total loss of 11 246). The number of educators increased by 3 894 over the next 2 years, with a slight dip (–758) between 2003 and 2004. Over 5 years, there was a total loss of 8 110 educators.

The upsurge between 2004 and 2005 can be ascribed to the fact that the 2005 SNAP Survey of schools included all SGB-paid educators at public schools.[5] The point, therefore, is that all these teachers had always been in the system as part of a relatively stable pool of educators, but they were not reported in the previous years (DoE 2006a, 2006b). If it is assumed that around 21 000 SGB-paid educators could have been added each year since 1999, then there was no significant difference between the number of practitioners in 1999 and the number of practitioners in 2006.

The approximate percentage of qualified teachers, within the working-age range, who are not working as educators is 41.4 per cent. The pattern of younger teachers leaving teaching after a few years

5 The SNAP Survey is a head count survey conducted on the 10th school day of the new school year, focusing on learner enrolment and educator numbers.

seems to be a common practice worldwide, as the young teachers tend to test their own interest levels, while older teachers would have been in the system for a long time. According to Crouch and Perry (2003: 489), 'the peaks for leaving [the teaching profession] are 59 and 23'. The first age group (59) leaves to retire, while the second age group (23) may have joined the profession 'while awaiting better prospects'.

While we concede that the database of educators includes those who are not currently teaching, still, if it is considered that there were 386 595 educators in the ordinary school system in 2006, then (in terms of supply) there were an additional 96 070 educators eligible to practise their skills available to the country. Based on the figures supplied by these studies and databases, it is doubtful that there will be a shortage (in numbers) of educators in 2008 or in the near future. This assumption corroborates the DoE's (2005: 35) statement that 'it would be reasonable to assert that there will be no shortage of teachers in South Africa, either in the short term or at any stage of the target period for the achievement of EFA [education for all], that is, until 2015'.

Migration

While, according to Appleton et al. (2006), there are no reliable figures from the DoE, the greatest employer of teachers, on how many teachers have left or have been leaving the South African education system for foreign countries, the reports from research (Appleton et al. 2006; De Villiers 2007; De Villiers & Degazon-Johnson 2007; Manik 2007; Morgan 2006), and from teachers who have remained behind, education managers, SGBs and their communities, suggest that qualified educators have been steadily migrating to other countries, with sometimes devastating effects on the classrooms they leave behind.

Apparently there is aggressive recruitment of South African teachers and those from other Commonwealth countries by foreign governments, especially the UK, which has resulted in emigration of qualified South African teachers, reported in studies such as De Villiers 2007, De Villiers and Degazon-Johnson 2007, Manik 2007 and Morgan 2006. These teachers are usually first-language English-speakers, a majority of whom are white, and therefore teachers who would be able to fit in at English schools. According to Manik (2007: 63), the two categories of migrant teachers are 'experienced' teachers and 'novice' teachers. In Manik's study, most experienced migrant teachers were married, female, Indian teachers, and the majority of the novice teachers were unmarried, white, female teachers. Both groups were either English-first-language speakers, or spoke English very well. The majority of African teachers would not meet that basic criterion. The result of this emigration, therefore, is that the highly competent teachers who have left have come mainly from the pool of white teachers, and from the Indian group, often in well-equipped and well-staffed public schools. Emigration of teachers to other countries has not been a factor in the schools with predominantly African learners and teachers. One has to look at other areas for the cause of teacher attrition in these schools. Evidently, in South Africa, even mobility, a common labour market factor anywhere in the world, is racially linked.

More research into the question of migration of South African teachers is needed.

Summary of teacher supply and demand

This section has presented an exploration of the claims that there is, or will be, a shortage of teachers in South Africa. According to data presented and analysed in this study, the shortage of educators is not a shortage in terms of numbers. What seems definitely to be the case is a shortage of critical skills among educators, and that is discussed in the next section.

It has to be noted that the analysis of the teacher supply and demand landscape, and conclusions drawn in this chapter about this landscape, rely heavily on DoE figures, while these figures may not be accurate. The process and procedures of collecting data from schools on profiles of schools and educators are suspect in many cases. The system of reporting is not uniform, and not properly maintained in most cases. Under such circumstances, reports may be manipulated by over-, under- or non-reporting of items and aspects that may have negative effects. With no proper monitoring, therefore, schools may inflate figures to suit specific purposes. DoE officials also may, and do, sometimes gloss over gaps and weaknesses, if the true picture may expose negligence or incompetence.

While, on the whole, data point to the fact that there is no shortage of teachers, there are, however, challenges in terms of the supply of teachers available. The challenges include a reported mismatch between demand and supply of teachers. Some of these challenges are:

- There are few qualified teachers in MST subjects.
- There are more humanities and social science teachers than MST teachers, which results in a great demand for the latter teachers, while there is an over-supply of the former.
- More teachers prefer urban areas to rural areas.
- Most teachers in the classrooms were trained for the previous dispensation (apartheid education, the discredited and discarded curricula, and homogeneous classrooms). It will take time before the new cadres of teachers, who are supposedly well trained and prepared for today's classrooms, make an impact in the classrooms and positively change the education system.
- The teaching profession is an aging profession.
- The number of teachers who leave the profession is not matched by the number of incoming teachers (newly qualified and immigrant) – the scale being heavier on the side of the former.
- Urban schools do not experience shortages of qualified and skilled teachers as severely as rural areas do.
- Former white schools do not experience a shortage of qualified and skilled teachers as much as black schools do.
- Fewer African students than white students register at university to study teacher education. This leads to the African race group, and therefore African schools and African areas, having a shortage of qualified and specialised teachers.
- The bursary scheme, 'Fundza Lushaka', introduced at the end of 2006 for 2007, offering bursaries to students who want to register for teacher education at university, did not attract as many students as were needed.
- The biggest share of the South African government's budget goes towards education, especially towards salaries of educators, with very little returns.

The actual critical skills of educators

The analysis presented thus far in the chapter has led to an assessment of the situation as one in which the scarce or critical skills shortage in the teaching profession is qualitative, not quantitative/numerical. In other words, South Africa has shortages of specific skills and teacher qualities within the current body of teachers, rather than a shortage in the number of teachers available. The skills scarcity varies according to geographical areas, school grades, subjects, race and age groups. It is possible, therefore, that a shortage in the number of teachers may be reported, because qualified/skilled teachers may be concentrated in some areas.

Teacher quality

A lot has been written about the shortage of MST teachers. This is easier to assess and make pronouncements on than some other shortages, as it can be measured by checking how many teachers

have qualified in these subjects, and how many are teaching them. It is the belief of this researcher, however, that the greatest problem is that of the quality of teachers. This is difficult to measure, and therefore it is difficult to assess the extent of this problem.

There is a need to identify what the necessary and desirable teaching skills are, and then measure in the best way possible the nature and extent of the scarcity. The ideal is to have adequate teachers in numerical terms, who are also good at what they do, otherwise the goals and ambitions of the society for a high level of education for all will not be realised. 'The delivery of quality learning in any education system, depends on sustaining the supply of teachers of quality and in sufficient numbers, to meet demand' (Paterson & Arends 2007: 10).

This study argues that the challenge of teacher supply has its origins in pre-1994 South Africa, and is not about the number of teachers in South African classrooms, but about the quality of the teachers who are teaching. The stand taken in this chapter is that, instead of expanding the pool of teachers, the focus should be on improving teacher quality.

Based on available data, the conclusion is that there is a great need for quality teachers to offer quality education. According to Bloch (2007), South Africa has not succeeded in providing quality education and ensuring equality in education. He states: 'If there is one phrase that summarises the failings of the education system, it is poor quality. In failing to achieve quality delivery, the education system is working only for a proportion of the learners who are able to access the relevant institutions' (Bloch 2007: 6). He ascribes this failure to the quality of teaching and teacher support. The areas where teachers are particularly weak are, in his view, 'teacher subject knowledge', 'time on task', and 'discipline' (Bloch 2007: 6).

Metcalfe concurs. She identifies teacher quality as the 'most significant factor affecting learner performance', and then, citing findings from research, states:

> …the conceptual knowledge of our teachers is low; teachers have a poor grasp of the subjects they teach; there is a high level of teacher error in the content and concepts presented in lessons; and teachers have low expectations of learners, who then achieve to these low expectations.[6]

The national DoE accepts these shortcomings, and so the National Policy Framework for Teacher Education and Development in South Africa of 2007 (RSA 2007) seeks to address this problem as it acknowledges the findings of the 1999 President's Education Initiative Research Project. This President's Project 'concluded that the most critical challenge for teacher education in South Africa was the limited conceptual knowledge of many teachers. This includes poor grasp of their subjects as evidenced by a range of factual errors made in content and concepts during lessons' (RSA 2007: 4–5).

According to Bloch (2007: 4), the result of poor quality in education is that '[South Africa] is not able to meet national goals, either around provision of adequate skills for growth, nor in terms of providing access to quality education that would enable equitable sharing of opportunities'. He argues that this affects the country's economy negatively, as the quality of education influences individuals' efforts towards improving their personal efficacy, productivity and incomes. 'Accordingly, the quality of education makes a significant difference to the prospects of achieving a wide range of individual and development goals' (UNESCO – Education For All, cited in Bloch 2007: 3).

6 Metcalfe M, Why our schools don't work…and 10 tips on how to fix them, *Sunday Times* 13 January 2008

In the DoE report, *Teachers for the future*, the impact of quality teachers and quality education on the economy is also established. The report states:

> Qualified teachers are amongst a nation's most valuable resources as they contribute towards ensuring quality education, and a continued flow of skilled young people into the economy. Qualified teachers have a noticeable impact on the quality of education. (DoE 2005: 46)

In the same document, the DoE notes that 'academic skills are not enough to have a positive influence on learners' results, and a broader teaching competence is also necessary' (DoE 2005: 46).

Also critically lacking among South African educators are linguistic skills, an area that seems not thoroughly explored. Experiences as an educator at university, teaching education students and supervising dissertations and theses of education students who are mainly practising teachers registered for higher degrees such as the BEd, honours and master's in education, have shown the lack of language skills that teachers manifest. These are mainly African-language-speaking South African teachers. (It is important to make this distinction because African-language-speaking teachers from other African countries, who were therefore not educated in South Africa, do not seem to have this problem.)

A significant majority of the already-mentioned (South African) African teachers cannot express themselves in the language of learning, which is usually English, even though their schooling and tertiary education may have been through the medium of English. The language weakness is not at the level of sophisticated linguistic styles, or use of colloquial language in formal writing, but is a lack of basic English language skills such as correct usage of tense, agreement between the noun and the verb, and construction of a proper sentence. The poor language skills extend to lack of reading skills, which makes studying for a senior degree very difficult, as this usually entails a lot of reading. It can be assumed, therefore, that the same teachers do not read in their fields, or enrich their teaching by reading extra texts.

It is therefore not surprising that the recent University of Pretoria Progress in International Reading Literacy Study (PIRLS), whose results were released on 29 November 2007, found that South African Grade 5 learners have not mastered basic reading skills and achieved the lowest scores in a literacy study of Grade 4 and 5 pupils in 39 countries (Howie et al. 2007: 60). There clearly is a link between the performance standard of the South African learners and the South African schools and the teachers who produce these learners. The study also found that 'in most schools insufficient time is spent on reading activities or formal reading instruction' and the study confirmed that 'South African teachers read less often in their spare time compared to those in the highest achieving countries in PIRLS 2006' (Howie et al. 2007: 61).

The age of the teachers seems to be a variable in the problem of lack of linguistic skills. For example, teachers in their fifties and sixties are more likely to have a better command of the language than their younger colleagues. It seems that the weak teachers are also predominantly teachers who were trained in colleges. This may need to be investigated.

Another critical skill that seems to be lacking among the teachers is that defined as a requirement by the national DoE, namely, that teachers should also be 'mediators of curriculum'. The launch in South Africa in 1997 of Curriculum 2005, using the outcomes-based education (OBE) approach, turned the spotlight on teacher training and the readiness of schools to implement the new curriculum. Of course, much criticism has been directed at the government and the Ministry of Education of that time. The introduction of this curriculum was strongly criticised for being an improper transplant of an approach

that is not suitable for the country, with inadequate preparation of teachers and rushed implementation of the curriculum.

While the criticisms above would apply to the whole country, it has been argued by analysts of the curriculum and the South African education system that the introduction of this curriculum emphasised the inequalities among schools and teachers. Schools that had better facilities, and 'better' teachers, were not derailed by the new curriculum. Some analysts argue that excellent and properly qualified teachers were comfortable with the approach that required them to be creative, and allowed them some choice with regard to teaching material (Harley & Wedekind 2004; Jacobs 2000; Jansen 1999). Some teachers, mainly in the previously white schools, reported that the approach advocated in the new curriculum was in line with the approach they had been using in their teaching anyway.

The picture in the rural, township and under-resourced schools in general is a disturbing one. The inadequate training of teachers in Curriculum 2005 and OBE had disastrous results in these schools. The teachers were mainly lost and could not apply the approach. On the other hand, the message teachers seemed to have received was that they could not continue to teach using the methods they had been using. So, even though they did not actually understand how they were supposed to teach using OBE, many abandoned the methods they understood and tentatively and half-heartedly started applying the new approach (Jansen 1999). There was a lot of confusion in schools. Most importantly, the confidence of the teachers in their teaching ability was destroyed.

Listening to teachers describe the difficulties they have with the OBE approach and with Curriculum 2005, it is evident that this is less about how they were prepared for the new curriculum than about the shortcomings of their pre-service training. The fact that inadequate preparation of all teachers in the new curriculum affects sections of the teacher/educator population differently, points to deficiencies and inequalities in the teaching profession that existed before the new curriculum was introduced.

The deficient teacher skills discussed above translate into weaknesses in learners who leave school after completing both the General Education and Training (GET) and FET phases. For those who leave for higher education and for the world of work, the complaints are that they (the learners) are not well prepared for the next phases – higher education or the workplace. Questions are then raised about the schools and teachers who produced these learners. The ill-preparedness of school-leaving students is then linked to the economy of the country. For instance, on the shortage of properly qualified MST teachers and the few students leaving school with good passes in these subjects, it is alleged that the economy of the country will be negatively affected:

> One of the greatest challenges currently facing this country is to produce sufficient skilled students in the field of mathematics and science to meet the growing demand for technically qualified personnel required to keep the economy on a strong growth trajectory.[7]

Linked to the needs already identified above, there are certain qualities that society values, and that every teacher should possess. Ideally, only prospective teachers who displayed these qualities would be admitted to the profession. However, not only is it difficult to assess whether teacher education applicants possess these qualities or dispositions, but the need for qualified teachers leads to admission of every teacher education applicant who meets the minimum academic requirements for admission into the teacher programme.

7 Merit in incentives for teachers, *Education Herald, The Herald* 8 February 2006

The problem of non- and under-qualification among white teachers, and to an extent, Indian and coloured teachers, seems minimal. The majority of teachers from these groups, and their schools – the former House of Assembly (Education Department for white people) schools, former House of Delegates (Education Department for Indian people) schools, and former House of Representatives (Education Department for coloured people) schools – seem to be competent teachers in their subjects/areas and the language of teaching, which may be their first language (English or Afrikaans) or second language (English or Afrikaans). For these teachers, the skill that is most needed in post-1994 South Africa is the skill of teaching diverse learners in the same classroom, usually referred to as Skills, Knowledge, Attitudes and Values. This seems to be a skill that has become very important for these teachers, as learners of different races, ethnicities and language groups are migrating to these schools. Research shows that the learner population has changed significantly to a very diverse learner population, while the teachers have remained largely mono-racial and monolingual. Media reports and experiences of South Africans, especially black people, are that these schools are finding it difficult to either shake off their racial policies, or to effectively integrate the different racial groups. What usually happens is assimilation of the incoming groups (Mda 2000; Moletsane et al. 2004; Soudien 1998).

Recent and current improvements in teacher quality

Since 1994, the DoE has introduced a number of programmes to increase the supply of qualified teachers, and to improve the quality of the currently practising teachers. The developments have included upgrading of non- and under-qualified teachers, and supplementary teacher education. Bursaries have also been made available to teacher education students, for example, the Fundza Lushaka (Teach the nation) bursaries, to address the question of decreasing numbers of students entering the teaching profession, with the aim of deploying these teachers in needy schools such as those in rural areas. Many of the developments have been in the area of MST teaching. The developments and support mechanisms have come from government departments and non-governmental organisations.

What still needs to be done?

Some of the actions that still need to be taken or efforts to be increased are:

- upgrading teachers in language skills, literacy, numeracy and computing skills. The pronouncement on the poor performance of South African learners in literacy and numeracy, placing them at the bottom internationally (Howie et al. 2007), is a reflection of the quality of their schools, teachers and learning environments;
- retraining/re-educating teachers currently in the system to enable them to cope with the demands of new curricula and new classroom realities – diverse classrooms, inclusive classrooms, social ills such as drugs, child-headed households, and the increasing numbers of orphans and vulnerable children;
- supplying educators to replace educators dying from AIDS-related illnesses, and those who have emigrated from the country and from the profession;
- improvement of working conditions of teachers, including their salaries;
- having enough teachers in all classrooms to maintain healthy teacher-learner ratios;
- providing and sustaining expertise and continuous lifelong learning, which should be infused in teacher development programmes;
- a strong investment in upgrading poor schools and their infrastructures, so that all schools have basic necessities, to reduce the need to migrate to former white and city schools;
- provision of schools and training of teachers that can produce students who are ready for higher education and to contribute to the economic development of the country; and
- investment in safety and security in schools by all parties, including the DoE, the private sector and community organisations.

Conclusion and recommendations

In this study, the issue of supply and demand among educators has been discussed at length. This last section specifically focused on teacher quality as a scarce and critical skill. From this analysis, questions for further research arise:

- How can educators be re-skilled in the required skills/competencies?
- Are long-practising educators re-educable?
- How do we improve the quality of education with the current cadre of teachers?
- Is the focus and emphasis on MST, to the exclusion of other subjects or specialisation areas, justified? Aren't literacy and numeracy the basic skills teachers should be competent in and teaching effectively, and should they not be the focus of our attention?
- What is the link between the actual critical teacher/educator skills needed and the economy of the country?
- What skills do educators think and say they need, as compared to what researchers think they need?

References

Appleton S, Morgan WJ & Sives A (2006) Should teachers stay at home? The impact of international mobility. *Journal of International Teacher Development* 18: 771–786

Arends F (2007) The employment status of educators. Paper presented at Research and Development Programme on Teacher Education in South Africa, 28–29 May 2007, Kopanong Hotel, Benoni

Arends F & Chisholm L (forthcoming) *Understanding teacher demand in South Africa*. Cape Town: HSRC Press

Bloch G (2007) The persistence of inequality in education: Policy and implementation priorities. Paper for Knowledge Week 20–22 November 2007, Development Bank of Southern Africa

Crouch L & Perry H (2003) Educators. In *Human resources development review 2003: Education, employment and skills in South Africa*. Cape Town: HSRC Press

De Villiers R (2007) Migration from developing countries: The case of South African teachers to the United Kingdom. *Perspectives in Education* 25(2): 67–76

De Villiers R & Degazon-Johnson R (2007) The political dichotomy of teacher migration. Editorial. *Perspectives in Education* 25(2): vii–xii

DoE (Department of Education, South Africa) (2005) *Teachers for the future: Meeting teacher shortages to achieve education for all*. Pretoria: DoE

DoE (2006a) *Education statistics in South Africa at a glance 2005*. Accessed 5 December 2007, http://www.education.gov.za/EMIS/emisweb/05stats/DoE%20Stat%20at%20a%20Glance%202005.pdf.

DoE (2006b) *2006 School realities*. Accessed 4 December 2007, http://www.education.gov.za/EMIS/emisweb/flyer/School%20Realities%202006.pdf.

DoE (2007) *Higher Education Management Information System (HEMIS) database 1999–2005*. Pretoria: DoE

DoL (Department of Labour, South Africa) (2006) *National scarce skills list (Asgisa aligned) 2006*. Accessed 17 October 2007, http://www.labour.org.za/download/11694/useful%20Document%20%20NSF%20%20National%Scarce%20Skills%20list%20(ASGISA%20Aligned)%202006.doc

DoL (2007) *State of skills in South Africa, 2006/07*. Pretoria: DoL

ETDP SETA (Education Training and Development Practices Sector Education and Training Authority) (2006) *Skills planning*. 30 November 2006. Accessed 17 October 2007, http://www.etdpseta.org.za/modules.php?op=modload&name=News&file=article&sid=877 2007/10/17

Harley K & Wedekind V (2004) Political change, curriculum change and social formation, 1990–2002. In L Chisholm (ed.) *Changing class: Education and social change in post-apartheid South Africa.* Cape Town: HSRC Press

Howie S, Venter E, Van Staden S, Zimmerman L, Long C, Scherman V & Archer E (2007) *Progress in International Reading Literacy Study (PIRLS) 2006 summary report: South African children's reading achievement*. Centre for Evaluation and Assessment, University of Pretoria

Jacobs M (2000) Curriculum. In E Lemmer (ed.) *Contemporary education: Global issues and trends*. Sandton: Heinemann Higher and Further Education

Jansen JD (1999) Setting the scene: Historiographies of curriculum policy in South Africa. In J Jansen & P Christie (eds) *Changing Curriculum: Studies on outcomes-based education in South Africa*. Cape Town: Juta

Kane-Berman J (2007) The skills deficit looks permanent. *Fast Facts* 12/2007: 1. South African Institute of Race Relations

Manik S (2007) To greener pastures: Transnational teacher migration from South Africa. *Perspectives in Education* 25(2): 55–65

Manuel T (2008) Budget Speech, 2008 Minister of Finance, 20 February 2008. Pretoria: National Treasury

Mda TV (2000) Integrated schooling. In TV Mda & MS Mothata (eds) *Critical issues in South African education: After 1994*. Cape Town: Juta

Mda TV & Erasmus J (forthcoming) Scarce and critical skills: Educators. Report on the project: *A multiple source identification and verification of scarce and critical skills in the South African labour market*, prepared for the Department of Labour. Pretoria: HSRC

Moletsane L, Hemson C & Muthukrishna A (2004) Educating South African teachers for the challenge of school integration: Towards a teaching and research agenda. In M Nkomo, C McKinney & L Chisholm (eds) *Reflections on school integration*. Colloquium proceedings. Cape Town: HSRC Press

Morgan J (2006) Is teacher migration a 'brain drain' or a positive move? *Id21 education: Communicating development research*. Accessed 4 March 2008, www.id21.org/education/e3jm2gl.html

Morrow W (2007) Teacher supply data (2005, 2006, 2007). Unpublished data supplied to the HSRC

NRF (National Research Foundation) (2002) Scarce skills studies at postgrad level. *National Research Foundation News*. Accessed 17 October 2007, http://www.NRF.ac.za/news/scarceskills.stm.

Paterson A & Arends F (2007) Teacher graduate production in South Africa, 1994–2005. *The teacher labour market: Problematising teacher supply and demand*. Unpublished report. Pretoria: HSRC

Peltzer K, Shisana O, Udjo E, Wilson D, Rehle T, Connolly C, Zuma K, Letlape L, Louw J, Simbayi L, Zungu-Dirwayi N, Ramlagan S, Magome K, Hall E & Phurutse M (2005) *Educator supply and demand in the South African public education system*: *Integrated report*. Report prepared for the Education Labour Relations Council. Cape Town: HSRC Press

RSA (Republic of South Africa) (2000) Declaration of colleges of education as subdivisions of universities and technikons. Amendment to Higher Education Act (Act No. 101 of 1997). Government Notice No. 1383. Pretoria: Government Gazette No. 21913, 15 December

RSA (2007*)* The national policy framework for teacher education and development in South Africa. Cape Town: Government Gazette No. 29832, April

SAQA (South African Qualifications Authority) (2007) *Trends in public higher education in South Africa 1995 to 2004. Analysis of the national learners' records database report 2*. Pretoria: SAQA

Soudien C (1998) 'We know why we are here': The experiences of African children in a 'Coloured' school in Cape Town, South Africa. *Race, Ethnicity and Education* 1(1): 7–29

South African Government Information (2006) Address delivered by the Deputy President, Phumzile Mlambo-Ngcuka, at the launch of the Joint Initiative for Priority Skills Acquisition (Jipsa), Presidential Guest House. Accessed 17 October 2007, http://www.info.gov.za/speeches/2006/06032810451001.htm

Stats SA (Statistics South Africa) (2006) *Labour Force Survey September 2005*. Accessed 21 December 2007, http://www.statssa.gov.za/PublicationsHTML/P0210September2005/html/P0210September2005.html

The Presidency (Republic of South Africa) (2006a) *Annual report of the Accelerated Shared Growth Initiative for South Africa (Asgisa)*. Pretoria: The Presidency

The Presidency (2006b) *Annual report of the Joint Initiative on Priority Skills Acquisition (Jipsa)*. Pretoria: The Presidency

CHAPTER 11

Artisans

Jeffy Mukora

In order to understand the nature of artisans in South Africa, it is important to consider what artisan skills are and the main sectors with which they engage. The term 'artisan' has a long history. Derived from the Latin word '*artire*' meaning 'to instruct in the arts', the term was used originally to apply to a skilled worker who makes things by hand. Up to the end of the middle ages, artisans were basically skilled labourers and training was ad hoc, with a 'master' training an 'apprentice' who would succeed him (until recently artisans were usually male).

From the 15th century onward, artisans started organising themselves in guilds and recognition as an 'artisan' became dependent on membership of a guild. Training became formalised under the aegis of the guilds and different hierarchical 'levels' of artisanship became part of the structure of guilds. With the onset of the industrial revolution, the range and scope of work undertaken by artisans became increasingly broad and complex as new technologies required new skills, and the governance and regulation of artisans shifted from independent guilds to state control, leading to the definition of an artisan being extended to include skilled workers who use tools and machinery in a particular craft.

The pathway to becoming an artisan was through an 'apprenticeship' with the aim of increasing the pool of people trained to intermediate-level skills. The defining feature of apprenticeships is that they involve both on- and off-the-job training. Thus, most apprentices (85 per cent) have a contract of employment with their sponsoring firm, and work in that firm, learning while they do so. The off-the-job component is supplied by 'learning providers'. These are typically either private training companies, employers themselves, or colleges of further education and training (FET). The result obtained will be a National Certificate at the appropriate level (N1–N6).

Current apprenticeships contain various elements, and all must be completed to obtain an apprenticeship certificate. These conditions are prescribed by the minister of labour (as set out in Government Gazette No. 2527 of 9 September 1977):

- *Entry requirements:* 'The minimum age and educational qualifications for commencing apprenticeship shall be 16 years and Standard 7' – although section 17 allows for 15-year-old persons to become apprentices.
- *Period of apprenticeship:* This lasts from three to five years depending on the designated trade.
- *Formal qualifications:* National Certificate, Part 2 (NATED 190/191-N1-N6).
- *Workplace experience:* as prescribed by the minister and linked to the period of apprenticeship.
- *External assessment:* This takes the form of successful completion of a qualifying trade test.

In the South African context, the legal framework regulating artisans and apprentices emanates from the Manpower Training Act (No. 56 of 1981) and subsequent regulations under the Act. This Act

superseded the Training of Artisans Act (No. 38 of 1951) and the Apprenticeship Act (No. 37 of 1944). The Manpower Training Act defines an apprentice as:

> …any person employed in terms of a contract of apprenticeship registered or deemed to be registered in terms of the provisions of section 16(3)(d) or section 18(1)(c) or (3) and, for purposes of sections 42, 50, 51, 54, and 56, and includes any minor employed in terms of the provisions of section 15 (Manpower Training Act 1981: xxxiv).

The person who successfully completes an apprenticeship is considered to be an artisan. This can be achieved through the two routes of the Manpower Training Act of 1981: S(13) MTA and S(28) MTA:

- Chapter 2, section 13 of the Manpower Training Act of 1981 refers to people who have been formally indentured as apprentices, who meet the age criteria, who serve the full time period and who pass the trade test as prescribed by the minister.
- Chapter 2, section 28 of the Manpower Training Act of 1981 refers to people not indentured under section 13 but who satisfy the Registrar of Training that they have gained sufficient work experience over an adequate period of time, and can therefore write a trade test, after which (if they pass), they can become qualified artisans.

Traditionally, apprenticeships were seen as providing the training for skilled manual workers, being used first in artisan trades and then later in manufacturing. In the latter part of the 20th century, however, the apprenticeship system declined, as these sectors themselves became less important in the South African economy.

Apprenticeships reached their low point in the 1980s, when employers ceased to offer them in the numbers previously offered, due to recession, the removal of support and the commercialisation and privatisation of the state-owned enterprises (SOEs).

The promulgation of the Skills Development Act (No. 97 of 1998) introduced the concept of a learnership. The Act proposed that learnerships would incorporate apprenticeship but did not say that apprenticeship would no longer be allowed. This was due to the increasing recognition of the shortage of intermediate (National Qualifications Framework (NQF) Level 2 and Level 3) vocational skills in the South African labour market. As a result, apprentices continue to be trained via the two routes of the Manpower Training Act of 1981, section 13 and section 28.

In addition to apprenticeship training, the Skills Development Act witnessed a massive growth in the number of participants enrolled in learnership programmes from the start of the four-year period (1 April 2001–31 March 2005) of the first phase of the implementation of the National Skills Development Strategy (NSDS). According to Kraak (2007), a total of 134 223 learners enrolled for learnerships in the period between 1 April 2001 and 31 March 2005. Research has revealed that most of these learnerships are in non-technical fields and until recently, have tended to be focused at very much lower skill levels than those that would be required for artisanal work. As a result, this learnership initiative has not sufficiently resolved the shortage of technical skills at the intermediate level.

This shortage of artisans in South Africa also exists alongside a massive expansion of FET college enrolments in engineering studies (in the FET context, artisan-related skills are clustered under engineering). According to Patel (2007), a total of 280 000 individuals graduated in engineering studies in 2000 but only 34 per cent found jobs in industry. This is primarily because most of these engineering students are not employer-sponsored and FET courses are not aligned to industry requirements. A recent development in this regard is to put these unemployed graduates into a skills programme or an internship contract that ends in a trade test.

Kraak (2007: 480) argues that these differing pathways for the production of technically skilled labour at the intermediate level '[constitute] a highly malfunctioning labour market'. Meaningful interventions and corrective measures are needed to enable greater co-ordination and articulation between these pathways to artisan skills development.

The government's Accelerated and Shared Growth Initiative for South Africa (Asgisa) has identified skilled artisans and vocational skills as critical for sustained growth (The Presidency 2006a). In a period of growth it is evident that the South African labour market lacks sufficient skilled professionals, managers and artisans, and that those aspects of the legacy of apartheid remain a contributory factor.

The expansion of intermediate artisan and technical skills for the growing economy has been identified as one of the five main areas for targeted intervention by the Joint Initiative on Priority Skills Acquisition (Jipsa) which was launched by the government on 27 March 2006. The Jipsa initiative argues that for both the public infrastructure and the private investment programmes, the single greatest impediment is the shortage of technically skilled labour at the intermediate level (The Presidency 2006b). This is being worsened by the government's massive investment in the infrastructure sector in preparation for the 2010 FIFA World Cup. The shortage of skills in key technical fields has been fuelled by a drastic decline in numbers of trained artisans over the last decades.

The demand for artisans

The demand for skills can be derived from changing patterns of sectoral employment due to shifts in the demand for goods and services, and changes in ways of producing goods and services (LSC 2005). For the purposes of quantifying the demand for artisans, a dataset of employment statistics[1] for the 'Major occupational group 7: Craft and related trades workers' in terms of the South African Standard Classification of Occupations (SASCO) (Stats SA 2005) was created from October Household Survey (OHS) and Labour Force Survey (LFS) data.[2] Spanning a 10-year period (1996–2005), the information extracted from the OHS (1996–1999) and the LFS (2000–2005 September cycle) is presented in the following sections. The overview covers the distribution of workers with regard to occupations and sectors, race and gender, and level of education.

The number of workers reportedly employed as craft and related trades workers increased from 1.2 million in 1996 to nearly 1.8 million in 2005, constituting a compound annual growth rate (CAGR) of 4.36 per cent in employment over the 10-year period (Table 11.1). The increase in demand occurred across all broad occupational categories, but more so for 'extraction and building trades workers' (4.88 per cent) and for 'metal, machinery and related trades workers' (4.62 per cent) than for 'other craft and related trades workers' (3.15 per cent) and for 'precision, handicraft, printing and related trades workers' (2.97 per cent).

However, it has to be noted that job growth occurred mainly in the informal sector of the economy (one reason for this is the increasing use of casual labour). Formal employment of craft and related trades workers fluctuated over the period under review: from 1.1 million in 1996, down to 0.92 million in 2001, and up to nearly 1.2 million jobs in 2005 (at a CAGR of 0.87 per cent). Employment growth in the formal sector of the economy was lower than the overall growth rate for extraction and building trades workers (1.05 per cent) and for metal, machinery and related trades workers (2.35 per cent), while formal employment for other craft and related trades workers and for precision, handicraft, printing

1 The number of people employed is used as a proxy for the demand for labour.
2 Labour force statistics are collected by Statistics South Africa (StatsSA) through its household surveys (OHS annually 1994–1999 and LFS twice-yearly since 2000).

TABLE 11.1: *Total numbers of craft and related trades workers from the OHS and the LFS databases, 1996–2005*

	Major group	Sub-major group			
Year	7: Craft and related trades workers	71: Extraction and building trades workers	72: Metal, machinery and related trades workers	74: Other craft and related trades workers	73: Precision, handicraft, printing and related trades workers
1996	1 205 170	560 057	334 929	239 364	69 310
1997	1 329 353	606 246	393 274	267 479	62 354
1998	1 348 203	641 658	386 314	245 500	74 730
1999	1 391 384	703 232	401 601	223 960	62 591
2000	1 535 889	754 953	438 922	271 747	70 267
2001	1 448 963	712 621	434 776	239 235	62 331
2002	1 416 671	661 786	443 903	243 265	67 717
2003	1 455 731	704 804	458 741	225 751	66 435
2004	1 554 683	786 578	443 328	252 593	72 184
2005	1 769 253	859 764	502 790	316 537	90 163
Distribution (average 1996–2005)					
Growth across sector					
Formal	0.87	1.05	2.35	–0.87	–3.87
Informal	20.09	23.44	20.54	14.10	23.02
Total	4.36	4.88	4.62	3.15	2.97
Employment across sector					
Formal	71.11	70.15	78.29	62.58	68.01
Informal	28.89	29.85	21.71	37.42	31.99
Occupation within sector					
Formal	100.0	47.57	32.34	15.45	4.63
Informal	100.0	49.83	22.07	22.74	5.36
Total	100.0	48.37	29.32	17.47	4.83

Source: Quantec 2007

and related trades workers showed negative growth. Informal-sector employment of craft and related trades workers showed significant growth across all sub-major group level occupations (at a CAGR of around 20 per cent). On average, more than a quarter of all craft and related trades workers were employed in the informal sector between 1996 and 2005.

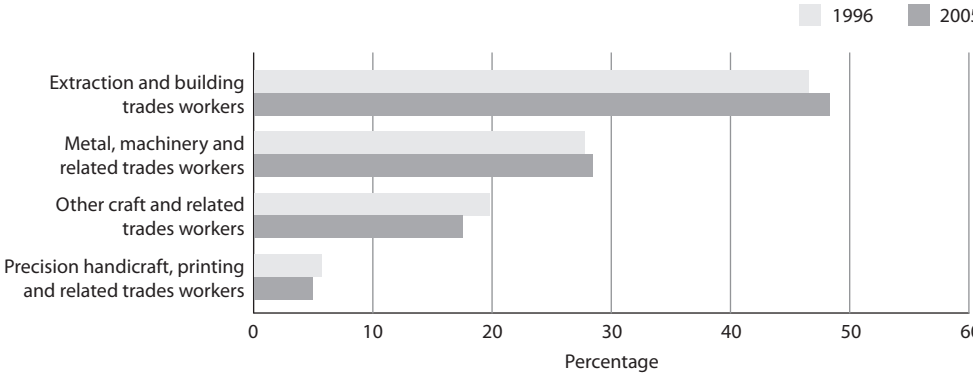
Figure 11.1 shows that nearly half of all craft and related trades workers were classified as extraction and building trades workers (of which the majority were building trades workers). Around a third of all craft and related trades workers were employed as metal, machinery and related trades workers (of whom nearly two-thirds were machinery mechanics and fitters). Less than a fifth fell into the category of other craft and related trades workers and around five per cent worked as precision, handicraft, printing and related trades workers.

Table 11.2 provides an overview of trends in employment opportunities for craft and related trades workers in different industry sectors. Strong growth in the employment of craft and related trades workers occurred in the construction sector and in wholesale and retail trade: repair of motor vehicles, motor cycles and personal and household goods; hotels and restaurants (at a CAGR of above 8 per cent). The agriculture, hunting, forestry and fishing sector, manufacturing sector and mining and quarrying sectors also showed growth in the demand for craft and related trades workers. The number of employment opportunities for craft and related trades workers in electricity, gas and water supply and in financial intermediation, insurance, real estate and business services declined at a compound annual rate of 4 per cent between 1996 and 2005. The number of craft and related trades workers declined marginally in the transport, storage and communication sector and stayed relatively constant in the community, social and personal services sector.

Strong growth in certain sectors and slower growth or decline in other sectors resulted in shifts in the distribution of craft and related trades workers across the different sectors. For example, in 1996, the manufacturing sector was the largest employer (one-third of all craft and related trades workers) but by 2005, the construction sector employed two-thirds of all craft and related trades workers. A fifth of all craft and related trades workers were employed in the wholesale and retail trade sector (mainly in the repair of motor vehicles, motor cycles and personal and household goods) in 2005, while in 1996, it was 14 per cent.

Nearly two-thirds (63.90 per cent) of all extraction and building trades workers were employed in the construction sector in 2005 (Table 11.3). A further 12.45 per cent were employed in the manufacturing sector and 10.41 per cent in mining and quarrying. Forty-four percent of all metal, machinery and related trades workers were employed in the wholesale and retail trade sector (mainly in the repair of motor vehicles, motor cycles and personal and household goods), followed by the manufacturing sector (32.32 per cent). The majority (76.69 per cent) of precision, handicraft, printing and related trades

FIGURE 11.1: *Occupation distribution at sub-major group level of craft and related trades workers, 1996 and 2005*



Source: Quantec 2007

TABLE 11.2: *Sectoral distribution of craft and related trades workers, 1996–2005*

Year	Total (N)	Agriculture, hunting, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction
1996	1 201 157	14 383	109 642	395 858	49 563	287 643
1997	1 324 940	21 156	123 605	405 753	46 346	331 620
1998	1 331 947	23 447	157 306	384 186	32 692	356 726
1999	1 383 963	29 227	172 173	390 196	22 332	375 152
2000	1 535 889	17 639	176 660	463 332	24 100	450 454
2001	1 448 963	15 432	173 033	440 801	24 049	429 673
2002	1 416 671	14 555	161 967	469 953	25 758	400 682
2003	1 455 731	20 631	162 978	460 271	26 172	414 307
2004	1 554 683	20 114	134 159	463 543	27 153	524 051
2005	1 769 253	20 404	120 171	545 192	32 807	581 571
CAGR	4.40	3.96	1.02	3.62	−4.48	8.14
Percentage distribution						
1996	100.00	1.20	9.13	32.96	4.13	23.95
1997	100.00	1.60	9.33	30.62	3.50	25.03
1998	100.00	1.76	11.81	28.84	2.45	26.78
1999	100.00	2.11	12.44	28.19	1.61	27.11
2000	100.00	1.15	11.50	30.17	1.57	29.33
2001	100.00	1.07	11.94	30.42	1.66	29.65
2002	100.00	1.03	11.43	33.17	1.82	28.28
2003	100.00	1.42	11.20	31.62	1.80	28.46
2004	100.00	1.29	8.63	29.82	1.75	33.71
2005	100.00	1.15	6.79	30.81	1.85	32.87

Source: Quantec 2007

Wholesale and retail trade: repair of motor vehicles, motor cycles and personal and household goods; hotels and restaurants	Transport, storage and communication	Financial intermediation, insurance, real estate and business services	Community, social and personal services	Private households, exterritorial organisations, representatives of foreign governments and other activities not adequately defined	Not applicable and unspecified
172 876	36 900	36 139	58 627	39 526	0
210 058	38 206	47 616	61 515	39 065	0
237 526	38 507	32 157	50 692	16 868	1838
249 461	47 238	24 574	58 077	15 170	363
307 174	31 005	20 263	42 596	2 667	0
272 444	38 562	17 288	37 527	155	0
253 633	31 753	14 643	39 476	4 250	0
277 712	23 341	24 258	44 754	967	340
273 296	32 931	30 038	46 996	2 166	236
354 993	31 873	24 379	57 097	766	0
8.32	–1.61	–4.28	–0.29		
14.39	3.07	3.01	4.88	3.29	0.00
15.85	2.88	3.59	4.64	2.95	0.00
17.83	2.89	2.41	3.81	1.27	0.14
18.03	3.41	1.78	4.20	1.10	0.03
20.00	2.02	1.32	2.77	0.17	0.00
18.80	2.66	1.19	2.59	0.01	0.00
17.90	2.24	1.03	2.79	0.30	0.00
19.08	1.60	1.67	3.07	0.07	0.02
17.58	2.12	1.93	3.02	0.14	0.02
20.06	1.80	1.38	3.23	0.04	0.00

TABLE 11.3: *Craft and related trades workers, by sub-major group occupation and sector, 2005*

	Extraction and building trades workers
Agriculture, hunting, forestry and fishing	875
Mining and quarrying	89 472
Manufacturing	107 043
Electricity, gas and water supply	25 530
Construction	549 396
Wholesale and retail trade: repair of motor vehicles, motor cycles and personal and household goods; hotels and restaurants	42 336
Transport, storage and communication	5 005
Financial intermediation, insurance, real estate and business services	5 371
Community, social and personal services	33 971
Private households, exterritorial organisations, representatives of foreign governments and other activities not adequately defined	766
Not applicable and unspecified	0
Total	859 764
Percentage distribution	
Agriculture, hunting, forestry and fishing	0.10
Mining and quarrying	10.41
Manufacturing	12.45
Electricity, gas and water supply	2.97
Construction	63.90
Wholesale and retail trade: repair of motor vehicles, motor cycles and personal and household goods; hotels and restaurants	4.92
Transport, storage and communication	0.58
Financial intermediation, insurance, real estate and business services	0.62
Community, social and personal services	3.95
Private households, exterritorial organisations, representatives of foreign governments and other activities not adequately defined	0.09
Not applicable and unspecified	0.00
Total	100.00

Source: Quantec 2007

Metal, machinery and related trades workers	Precision, handicraft, printing and related trades workers	Other craft and related trades workers
7 139	194	12 195
28 665	1 640	393
162 515	69 145	206 490
7 203	75	0
25 601	5 338	1 236
222 227	6 567	83 863
26 868	0	0
10 465	4 090	4 453
12 107	3 113	7 906
0	0	0
0	0	0
502 790	90 163	316 537
1.42	0.22	3.85
5.70	1.82	0.12
32.32	76.69	65.23
1.43	0.08	0.00
5.09	5.92	0.39
44.20	7.28	26.49
5.34	0.00	0.00
2.08	4.54	1.41
2.41	3.45	2.50
0.00	0.00	0.00
0.00	0.00	0.00
100.00	100.00	100.00

workers were employed in manufacturing. Two-thirds of all other craft and related trades workers have worked in the manufacturing sector and a quarter in wholesale and retail trade.

It can be deduced from the above information that the greatest (and growing) demand for craft and related trades worker skills is for extraction and building trades workers in the construction sector. This can be ascribed to the infrastructure boom in preparation for the 2010 FIFA World Cup. This includes building or improving the 10 stadiums to be used, and investment in the environs and access routes to the stadiums.

The second-largest demand is for metal, machinery and related trades workers in the repair of motor vehicles, motor cycles and personal and household goods and in the manufacturing sector. This can be attributed to the massive increase in new car sales in the South African motor industry for the past three years. Manufacturing, Engineering and Related Services Sector Education and Training Authority (MERSETA) CEO Raymond Patel said that, with 35 000 new vehicle units hitting South African roads every month, it would be a difficult task to ensure that there were enough skilled people to service them.[3]

We will see in the supply-side section of this analysis that the demand in these areas is reinforced by the government's allocation of R1.9 billion to the re-capitalisation of FET colleges over the period 2006/07–2008/09. R50 million is provided for the planning of the re-capitalisation of the colleges. This planning includes the development of curricula for 11 priority skills programmes to be offered from 2007, replacing the N1–N6 programmes. The 11 programmes or vocational fields of study fall into the priority areas identified by Asgisa, including civil engineering and building construction, electrical infrastructure construction, engineering and related design.

Demographic profile in terms of race, gender and age

The race and gender profiles of employed craft and related trades workers are presented in Tables 11.4, 11.5 and 11.6. The share of African craft and related trades workers increased by 14 percentage points from 60.79 per cent in 1996 to 74.55 per cent in 2005 (Table 11.4). Consequently the share of coloured, Indian and white craft and related trades workers declined. The share of African craft and related trades workers in the formal economy increased by 8 percentage points, from 60.07 per cent in 1996 to 68.35 per cent in 2005. The table also shows that there are more African craft and related trades workers than those of other races active in the informal economy. This can be ascribed to South Africa's historically deep-seated inequalities, with Africans being the most marginalised section of the population.

Women have increased their share amongst the employed from 39.93 per cent in 1996 to 42.55 per cent in 2005 (Table 11.5). In comparison with total employment, only 16.75 per cent of all craft and related trades workers were women in 2005 (down from 17.97 per cent in 1996) (Table 11.6). It is only as other craft and related trades workers that women dominate. By far the majority of extraction and building trades workers (94.47 per cent), metal, machinery and related trades workers (96.34 per cent) and precision, handicraft, printing and related trades workers (62.51 per cent) are men.

The age distribution of crafts and related trades workers is reported in Tables 11.7 and 11.8.

In general, craft and related trades workers are relatively young: around 80 per cent are younger than 50. This can be attributed to the large number of matriculants and FET college graduates entering the artisan occupational category and this will be highlighted in the supply section. From Table 11.7 it can

3 Personal communication, 17 July 2007

TABLE 11.4: *Craft and related trades workers, by race (%), 1996–2005*

Formal sector	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
African	60.07	62.21	64.53	64.42	64.13	61.08	63.45	61.77	65.33	68.35
Coloured	16.71	14.59	14.08	14.02	14.07	13.75	14.41	17.39	14.27	14.37
Indian	4.46	4.02	3.22	3.23	3.81	4.73	3.19	3.14	3.03	2.56
White	18.76	19.18	18.03	18.30	17.82	20.24	18.95	17.61	17.32	14.47
Unspecified	0.00	0.00	0.14	0.03	0.18	0.20	0.00	0.10	0.05	0.25
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Informal sector	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
African	67.81	77.91	76.83	78.18	81.35	84.41	86.22	85.79	85.79	87.30
Coloured	11.50	11.29	8.68	9.83	10.42	7.59	6.42	5.26	5.51	6.41
Indian	4.64	1.55	3.50	3.01	1.57	1.61	1.61	3.32	2.31	1.99
White	16.04	9.24	10.98	8.97	6.06	6.27	5.75	5.64	6.30	4.23
Unspecified	0.00	0.00	0.00	0.00	0.60	0.12	0.00	0.00	0.10	0.07
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
African	60.79	65.66	67.25	68.73	69.65	69.53	70.63	69.52	72.44	74.55
Coloured	16.23	13.85	12.89	12.73	12.80	11.56	11.83	13.51	11.21	11.74
Indian	4.48	3.53	3.37	3.15	3.01	3.61	2.66	3.23	2.76	2.38
White	18.51	16.96	16.38	15.37	14.23	15.13	14.88	13.67	13.53	11.15
Unspecified	0.00	0.00	0.10	0.02	0.32	0.17	0.00	0.07	0.06	0.19
Combined total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Quantec 2007

TABLE 11.5: *Gender distribution (%) of all employed people, 1996–2005*

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Male	60.07	61.01	60.22	57.96	54.50	55.91	56.18	55.44	58.32	57.41
Female	39.93	38.99	39.78	41.97	45.49	44.09	43.79	44.56	41.64	42.55
Unspecified	0.00	0.00	0.00	0.07	0.01	0.00	0.03	0.00	0.04	0.04
All employed	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 11.6: *Craft and related trades workers, by gender (%), 1996–2005*

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
7: Craft and related trades workers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Male	82.03	82.70	85.76	84.56	84.74	83.42	83.53	84.20	84.65	83.25
Female	17.97	17.30	14.24	15.40	15.26	16.58	16.47	15.80	15.35	16.75
Unspecified	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
71: Extraction and building trades workers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Male	93.29	94.61	97.02	95.95	95.45	93.69	94.80	92.49	94.55	94.47
Female	6.71	5.39	2.98	3.96	4.55	6.31	5.20	7.51	5.45	5.53
Unspecified	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
72: Metal, machinery and related trades workers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Male	94.40	96.15	97.84	95.94	97.68	96.99	96.83	96.21	96.58	96.34
Female	5.60	3.85	2.16	4.06	2.32	3.01	3.17	3.79	3.42	3.66
Unspecified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73: Precision, handicraft, printing and related trades workers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Male	72.32	70.54	70.82	70.19	72.52	62.33	61.96	55.70	62.06	62.51
Female	27.68	29.46	29.18	29.81	27.48	37.67	38.04	44.30	37.94	37.49
Unspecified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74: Other craft and related trades workers	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Male	41.10	38.75	41.89	32.41	37.22	33.65	34.60	42.30	39.38	37.89
Female	58.90	61.25	58.11	67.59	62.78	66.35	65.40	57.70	60.62	62.11
Unspecified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Quantec 2007

TABLE 11.7: *Age distribution of all craft and related trades workers, 1996–2005*

Age category	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
15–19	1.24	0.98	1.64	1.80	1.16	1.35	1.51	1.76	0.97	1.52
20–24	10.06	9.07	8.70	9.12	8.72	7.78	8.56	7.75	9.75	10.37
25–29	14.82	14.85	17.53	14.83	14.40	13.74	14.56	13.68	14.85	15.25
30–34	18.17	18.97	18.21	17.36	16.20	16.84	16.32	15.55	18.27	19.37
35–39	16.23	17.34	17.20	18.65	17.27	17.03	17.61	17.08	14.33	13.71
40–44	13.02	15.26	14.20	13.91	14.79	14.53	15.46	15.43	13.08	12.22
45–49	11.46	10.37	9.88	10.77	11.78	12.83	11.72	12.78	10.79	10.87
50–54	7.02	6.98	6.53	6.39	7.91	7.77	7.13	7.58	9.54	7.36
55–59	4.60	3.87	3.93	4.22	4.78	4.25	4.07	4.83	4.79	5.13
60–64	2.11	1.34	1.28	1.54	1.87	2.49	1.82	2.69	2.15	2.43
65–69	0.84	0.87	0.51	0.67	0.69	0.72	0.62	0.41	0.98	0.92
65+	0.44	0.11	0.39	0.44	0.33	0.51	0.34	0.42	0.34	0.49
Unspecified	0.00	0.00	0.00	0.30	0.12	0.18	0.28	0.05	0.15	0.35
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Younger than 40	60.51	61.21	63.28	61.76	57.75	56.73	58.56	55.81	58.18	60.22
40+	38.21	37.82	35.82	36.83	41.12	41.87	40.20	43.31	40.35	38.00

Source: Quantec 2007

be seen that about 60 per cent of all craft and related trades workers were younger than 40 years of age between 1996 and 2005.

'Qualified' artisans are relatively young: 67.14 per cent were younger than 40 years old in 2005 (Table 11.8). This may relate to the FET output discussed further in the supply section of the chapter. However, Indlela data on the apprentices who have passed their trade test (see supply section) show that artisans are aging: it is estimated that nearly three-quarters (72.94 per cent) of artisans are 40 years and older.[4]

The fact that artisans are aging mainly applies to white craft and related trades workers. The mainly white individuals who were allowed to qualify as artisans before blacks (that is, African, coloured and Indian people) were allowed to do so are indeed getting old now (Table 11.8). It is encouraging to see that the majority of African and coloured craft and related trades workers are younger than 40 (although there have been no increases in recent output of artisans, but rather increases in FET output); this does point to black people getting opportunities to qualify as artisans.

4 Joe Lishman, Institute for the National Development of Learnerships Employment Skills and Labour Assessment (Indlela), personal communication, July 2007

TABLE 11.8: *Percentage of 'qualified' craft and related trades workers younger than 40, 2000–2005, by race*

'Qualified' and younger than 40	2000	2001	2002	2003	2004	2005
African	69.49	77.30	78.12	56.93	81.58	78.64
Coloured	52.05	70.45	74.33	65.09	71.07	92.71
Indian	42.36	60.74	49.61	73.40	96.34	64.79
White	60.62	52.90	33.32	44.89	48.43	49.83
Total	61.67	62.95	52.46	53.10	65.46	67.14

Source: Quantec 2007

Supply of artisans

This section of the chapter investigates trends in enrolments and graduations of people qualifying as artisans, and factors that may influence future supply. It also considers those people who had been working as artisans for many years but whose skills had never been developed beyond the jobs they did.

The supply of artisans in the South African labour market is considered in terms of the three current routes to artisan formation. The first one is the traditional apprenticeship route comprising sections 13 and 28 of the Manpower Training Act of 1981. The historical decline of the apprenticeship training system will be demonstrated and the factors behind the demise will be discussed.

The second route to artisan formation is the learnership route, which was established through the Skills Development Act of 1998. The learnership programmes established in terms of this Act were meant to overcome the problems associated with the old traditional apprenticeship system. However, there is insufficient evidence as to the total number of learners who have gone through the learnership route, passed the trade test and qualified as artisans.

The third route is the FET N1–N6 qualifications route (without employer sponsorship). Beneficiaries of this route exit the college system with artisanal-type skills but face unemployment after graduation.

The apprenticeship system

Apprenticeship training has a long history in South Africa. It is not the object of this section to repeat the complete history, but selective references will be made to aspects of it that are considered relevant to the present discussion.

It is well documented that South Africa's racially based policies of separate development led to the exclusion of the majority of black workers from opportunities for technical education and training (Bird 2001; McGrath 1996; Mukora 2006). Several Acts were passed to bring the training system closer to the policy of separate development, including but not limited to the Apprenticeship Act of 1922, which set down high educational standards as prerequisites for entering apprenticeships. Because of the low level of education that black South Africans received, these requirements effectively precluded and prevented most black youths from being able to enter apprenticeships.

The provisions of the Apprenticeship Act of 1944 and the Training of Artisans Act of 1951 were made more accessible to whites than to any other racial groups. This differentiated treatment of black education

and training placed blacks in the structural position within the economy of being a vast resource of unskilled labour. In summary, the apartheid training policy was shaped by a few opportunities for black workers and an emphasis on training and skilling for whites, given the racially defined craft model of apprenticeship.

The major trends of the period that commenced late in 1974 and lasted until 1979 were deepening economic recessions, a fall in the price of gold in 1975, a high rate of inflation, increased black unemployment and yet acute shortages of skilled manpower. Many commentators (Bird 2001; Chisholm 1992; Davies 1984) saw the skilled labour crisis as a result of restrictions placed on the training of blacks, due to the apartheid education and training policies. Even though these policies were suitable for the needs of the capitalist system of production of the time, they become less functional under conditions of increased economic growth (Mukora 2006).

In South Africa, the conditions of 'increased economic growth' speeded up moves by capital to tackle the skilled labour crisis, which had been created by defining skill as a quality that white workers possessed and could acquire. Reforms were introduced to the labour and training legislation, which resulted in the passage of the Manpower Training Act of 1981.

This Act replaced a large number of laws which had created racially segregated institutions for the training of employees. It was the first consolidated law to regulate and promote training in all sectors of the economy under a single, non-racially defined Act. For the first time, Africans could be indentured as apprentices. However, few blacks were given artisan and technician status, while white workers continued being the recipients of company and state training programmes. In 1982, 92.9 per cent of artisans and 87.6 per cent of technicians employed in the industrial sector in South Africa were white, while 3.1 per cent of artisans and 6.9 per cent of technicians were black (Kraak & Von Holdt 1990: 17).

Between 1970 and the mid- to late-1980s, there was a significant increase in the overall number of apprentices qualifying as artisans. In 1985, for example, 13 500 apprentices graduated as artisans. However, by this time, fundamental questions were being asked about the future validity of apprenticeships in many countries, such as the UK, Australia and South Africa. These concerns triggered a dramatic decline in apprenticeship training in South Africa, from the early 1990s to the present period (Table 11.9).

Table 11.10 highlights a continuation of the decline in the number of newly indentured apprentices, with the metal, motor and railways sectors being the most affected.

Between 1991 and 1999, the number of new apprentice contracts showed a significant decline. It fell from 10 758 in 1991 to 7 492 in 1992, 6 247 in 1993, and down to 5 545 in 1995. In 1999, the number was at 3 129.

As mentioned earlier, the promulgation of the Skills Development Act of 1998 retained certain clauses relating to apprenticeship training. As a result, apprentices continue to be governed by sections 13 and 28 of Chapter 2 of the Manpower Training Act.

Table 11.11 thus highlights the number of apprenticeships enrolled via these two routes during the period 1 April 2001–31 March 2005. This period constitutes the 4-year period of the first phase of the implementation of the NSDS. A total of 21 237 learners were indentured as apprentices in this 4-year period, and counted together with the number of employed people enrolled in apprenticeships in terms of section 28 during the same 4-year period, gives a grand total of 36 703. These figures confirm a continued decline in apprenticeship training in the current period.

TABLE 11.9: *Total number of apprentices qualifying as artisans, 1970–2004*

Year	Arranged	Passed	Year	Arranged	Passed
1970	14 500	5 500	1988	18 000	11 000
1971	16 500	6 050	1989	15 500	8 000
1972	16 000	7 000	1990	15 000	7 500
1973	15 950	7 000	1991	14 900	7 200
1974	18 100	8 000	1992	15 050	8 000
1975	18 500	8 050	1993	16 000	9 550
1976	17 000	8 050	1994	11 800	7 000
1977	18 000	8 500	1995	9 000	5 000
1978	19 000	9 500	1996	5 000	3 000
1979	18 400	9 600	1997	8 910	4 874
1980	18 400	10 000	1998	9 403	4 933
1981	18 300	10 500	1999	9 517	5 145
1982	19 500	11 000	2000	7 826	3 703
1983	22 100	12 000	2001	5 790	3 527
1984	22 500	12 000	2002	6 448	2 916
1985	26 000	13 500	2003	5 280	2 779
1986	24 950	13 100	2004	7 004	2 833
1987	23 000	13 000	Total	527 128	269 310

Source: Joe Lishman, Institute for the National Development of Learnerships Employment Skills and Labour Assessment (Indlela), personal communication, July 2007

Note: a. 'Arranged' refers to the total number of apprentices who sit for the trade test in a particular year after having undergone the necessary training.

Race and gender profiles of artisans

Tables 11.12 and 11.13 show a historical and current dominance of white male artisan graduates.

Table 11.12 provides racially classified figures from 1977 to 1981. In 1977 there were no Africans registered as apprentices. Of the 10 527 indentured apprentices in 1980, 8 568 were white (81 per cent), 1 406 were coloured (13 per cent), 471 were Indian (4 per cent) and 82 were African (0.8 per cent).

Trends in supply from public FET colleges

FET colleges are another important avenue for technical skills development at the intermediate level, with Minister of Education Naledi Pandor describing them as having taken a central role in the delivery of priority skills needed in South Africa (Pandor 2007). The new curriculum for FET colleges that

TABLE 11.10: *Numbers of new apprenticeship contracts prior to the learnership era, 1991–1999*

Industries	1991	1992	1993	1994	1995	1996	1997	1998	1999	% change: 1991–1999
Aerospace	259	257	43	63	85	76	158	81	176	–32.05
Automobile	187	109	105	77	59	56	47	58	15	–91.98
Building	417	348	222	230	254	263	269	170	107	–74.34
Carbonated soft drink	0	0	0	0	0	0	12	14	7	–
Chemical	126	64	58	32	62	0	91	127	5	–96.03
Dairy	0	0	0	0	0	0	2	4	0	–
Diamond cutting	7	1	3	1	1	0	0	4	5	–28.57
Electrical contracting	162	322	150	277	230	177	231	226	197	21.60
Eskom	225	156	126	71	93	133	28	27	203	–9.78
Furniture	179	136	199	70	61	70	112	34	27	–84.92
Government	202	208	100	86	123	57	71	40	29	–85.64
Hairdressing	335	462	733	244	338	397	455	347	341	1.79
Jewellers & goldsmiths	63	21	35	32	54	16	17	7	17	–73.02
Local government	566	296	172	143	164	111	303	122	278	–50.88
Metal	3 911	1 940	1 387	1 227	980	1381	682	320	320	–91.82
Mining	880	1 200	942	976	1 644	840	1 476	815	366	–58.41
Motor	1 855	1 217	1 524	972	1 025	1 349	1 026	684	594	–67.98
Printing	422	400	283	224	186	169	282	22	147	–65.17
Sugar manufacture	43	19	25	9	56	37	52	28	1	–97.67
Textile	0	0	19	11	18	20	22	32	70	–
Transnet (railways)	907	332	113	244	107	140	263	150	224	–75.30
Tyre & rubber	12	4	8	13	5	0	0	0	0	–
Total	10 758	7 492	6 247	5 002	5 545	5 292	5 599	3 312	3 129	–70.91

Source: Moleke 2006

TABLE 11.11: *Total number of apprenticeships (sections 13 and 28), 1 April 2001–31 March 2005*

SETA	Apprenticeships enrolled between 1 April 2001 and 31 March 2005	Apprenticeships enrolled between 1 April 2001 and 31 March 2005	Total number of apprentices enrolled between 1 April 2001 and 31 March 2005
	MTA section 13	MTA section 28	Sections 13 and 28
FASSET	0	0	0
BANKSETA	0	0	0
CHIETA	929	929	1 858
CTFL	88	35	123
CETA	351	0	351
DIDTETA	1 529	0	1 529
ETDPSETA	0	0	0
ESETA	568	191	759
FOODBEV	90	0	90
FIETA	586	55	641
HWSETA	0	0	0
ISETT	0	0	0
INSETA	0	0	0
LGWSETA	1 991	619	2 610
MAPPP	1 408	167	1 575
MQA	3 494	402	3 896
MERSETA	6 935	5 642	12 577
POSLEC	0	0	0
PAETA	5	92	97
PSETA	20	5 887	5 907
SETASA	38	0	38
SERVICES	808	789	1 597
THETA	0	0	0
TETA	2 397	658	3 055
W&RSETA	0	0	0
TOTAL	21 237	15 466	36 703
Average enrolment per annum	5 309	3 866	9 175

Source: DoL 2006

Note: MTA = Manpower Training Act

TABLE 11.12: *Apprentices registered (N), 1977–1981*

Year	1977			1980				1981			
	W	C	I	W	C	I	A	W	C	I	A
Total	10 066	871	323	8 568	1 406	471	82	9 232	1 595	645	495

Source: Bird 2001

Note: W = White, C = Coloured, I = Indian, A = African

TABLE 11.13: *Total stock of apprentices (%), by race and gender, 2000–2005*

Black		People with disabilities		White		
Male	Female	Male	Female	Male	Female	Total
48.5	6.9	0.1	0.0	40.9	3.5	100

Source: DoL administrative data supplied to the author, September 2006

Note: 'Black' comprises the African, Indian and coloured groups.

will lead to National Certificate (Vocational) (NC(V)) qualification is a comprehensive and co-ordinated response to this skills development agenda.

Department of Education (DoE) research shows that the previous programmes have had some value, but are generally outdated, including the National Technical Education programmes, better known as NATED (N1–N6), some of which have not been revised since the 1980s.

Other programmes to be replaced are the National Certificate Orientation or N1, which was the orientation programme used to bridge the mathematics and science gap that some students might suffer from; the National Intermediate Certificate, which is parallel to Grade 11, and the National Senior Certificate, parallel to the high school Senior Certificate, and commonly known as 'matric'.

The NC(V) has been 'marketed' by the DoE as the solution to the lack of artisan development in South Africa, although no workplace training exists that is currently required within the NC(V) training curriculum. This makes it difficult to make an assessment of the actual contribution of FET colleges to artisan development. This has led to a further blurring and confusion as to what the training routes or pathways are to becoming an artisan.

The situation has also been further complicated by the fact that the introduction of the NC(V) and the phasing out of the NATED programmes (N1 and N2) negates the traditional path to becoming an artisan. In the old system, apprenticeships acquired their theoretical component through the National Certificates Part 1 and 2 (NATED N1 and N2).

The DoE is currently updating FET colleges, mostly by modernising workshops and physical resources. It is aiming to finalise the updating of training programmes for 22 priority artisanships by the end of 2008 and to set aside R600 million for bursaries for FET students between 2007 and 2010. Partnerships are actively encouraged to ensure that colleges are responsive to industry demand.

The 22 priority artisanships are:

- engineering: welders, electricians, fitters, turners, millwrights, sheetmetal workers, boilermakers, mechatronics, mechanics, toolmakers, patternmakers;
- construction: bricklayers, plumbers, carpenters, joiners, shutterhands, steel fixers, glaziers, plasterers, tilers;
- other: sound technicians, instrumentation and electronics technicians.

Private and public FET colleges are already contributing to the development of artisan skills. Comprehensive data on the number of learners who have completed a *qualification* in a particular field of study are not available. No data are available for private colleges. With regard to public FETs, the only data available from the DoE on FET colleges relate to *subjects* (called instructional offering) entered and passed. It is impossible to quantify FET output in terms of artisan skills. However, an overview of trends in the total number of learners who have passed an exam in a particular occupational field (for example, Construction Trades) does provide an indication of the contribution made by the FET colleges.

In the FET context, artisan-related skills are clustered under engineering studies. According to Vinjevold (2007), a total of 211 000 learners were enrolled at FET colleges in engineering studies in 2004 (Table 11.14). Learners in engineering studies constituted more than half (56.57 per cent) of total enrolment at FET colleges in 2004. Nearly two-thirds (62.09 per cent or 131 000) of engineering learners were enrolled at N1–N3 Level and 54 000 were enrolled in N4–N6 courses. The key issue here is that most of these graduates do not have employer sponsorship, and face unemployment as a result. If all these engineering learners can be channelled into skills programmes in the workplace, then FET colleges can make a massive contribution towards the training of 50 000 artisans by 2010.

Table 11.15 shows the total number of learners who have passed engineering studies at Level 1–Level 3. A total of 604 081 learners passed Level 1, 536 134 passed Level 2 and 419 780 learners passed Level 3.

The Level 4–6 graduates are significant because they are offered at a level higher than that required for artisanal labour. However, these graduates are not qualified artisans because of lack of workplace experience and they still have to pass the trade test.

It seems from Tables 11.14–11.16 that public FET colleges do provide artisan-type skills. Nonetheless, employers continue to report a shortage of qualified artisans. The explanation is that employers perceive FET output as not providing the kind of skills that they require in industry. The FET college problem arises because many learners who are currently undertaking college studies within the priority areas do so with insufficient or no access to workplace experience. With only limited opportunity or none at all for access to workplace experience, these learners learn theory as theory, mainly for examination purposes and for access to further studies (Young & Gamble 2006).

Elliott (2006) elucidates the college problem by arguing that the current FET colleges' learning outcomes are not aligned with industry needs. The quality of FET graduates, as she puts it, is not what is required in the workplace. According to Gamble (2004), workshop training and workplace experience are crucial to vocational preparation. Workshop training assists in the transmission of general principles (trade theory), while workplace training, on the other hand, teaches the procedures of a particular workplace and situation-specific competence.

Whyberd (2007) also affirms that it is in the interest of young people, employers and the country that those who seek to follow a vocational qualification through the further education route in the UK

TABLE 11.14: *Enrolment in FET colleges, 2004*

	Business	Engineer	Other	Total
Programme	N	N	N	N
NIC/NSC	20 000	9 000	4 000	33 000
N1–N3	13 500	131 000	6 500	151 000
N4–N6	73 500	54 000	6 000	133 500
Other	9 500	17 000	29 000	55 500
Total	117 000	211 000	45 000	373 000
	Business	Engineer	Other	Total
Programme	%	%	%	%
NIC/NSC	17.17	4.27	8.79	8.85
N1–N3	11.59	62.09	14.29	40.48
N4–N6	63.09	25.59	13.19	35.79
Other	8.15	8.06	63.74	14.88
Total	100.00	100.00	100.00	100.00
Distribution	31.23	56.57	12.20	100.00

Source: Vinjevold 2007

and the FET route in South Africa should choose options that deliver the skills that employers need. For these learners, progression to skilled employment, rather than qualifications achieved, is the true measure of success.

However, there are also some indications from research that some big construction companies are saying that although there is a boom in the industry, and although there is a shortage of skills, they are working with the skills that are available and will complete their projects (for example, stadiums) on time. We have seen from the LFS data, which indicate that there are a large number of people working as craft and related trades workers and who may have passed exams in artisan-related occupation fields, coupled with Indlela's data on exams that have been arranged but not passed, that there may be a large number of individuals who do not have the artisan's ticket but are working as artisans. Most employers will prefer this situation, because basically they are paying their employees less than if they were qualified, and the work still gets done.

Learnerships

As part of the Department of Labour's (DoL) commitment to ensuring the implementation of a skills revolution, it drafted an initial Green Paper on skills development in 1997. The Green Paper proposed the introduction of a national levy/grant system (which was strongly contested by employers) so as to increase investment and employer involvement in training; the establishment of Sector Education and Training Authorities (SETAs) to drive implementation; and the introduction of learnerships which sought to go beyond the racially restrictive apprenticeship system to cover all skill levels and sectors. The learnership system was seen as an intervention to redress the inequities of the old apprentice-

TABLE 11.15: *Occupation fields in which Level 1–3 learners in engineering studies have passed exams, accumulated total 1996–2005*

Occupation fields	Level 1		Level 2		Level 3	
	N	%	N	%	N	%
Mechanical Engineering	265 802	44.00	180 976	33.76	168 648	40.18
Electronics and Telecommunications	103 353	17.11	118 160	22.04	143 434	34.17
Telecommunications	12 183	2.02	34 885	6.51	34 008	8.10
Construction	45 189	7.48	37 179	6.93	28 880	6.88
Automotive Electricians and Mechanics	41 220	6.82	34 118	6.36	12 588	3.00
Electrician	84 001	13.91	74 746	13.94	10 340	2.46
Manufacturing	4 588	0.76	2 523	0.47	6 757	1.61
Chemical Technician	7 767	1.29	5 636	1.05	4 789	1.14
Fabrication Engineering	13 682	2.26	13 310	2.48	2 549	0.61
Mining	6 205	1.03	4 332	0.81	2 075	0.49
Waste Water Plant Operator	1 107	0.18	671	0.13	1436	0.34
Aviation	653	0.11	888	0.17	906	0.22
Wood and Paper Manufacturing	3 447	0.57	1 192	0.22	888	0.21
Panelbeaters and Vehicle Body Builders, Trimmers and Painters	3 162	0.52	2 093	0.39	798	0.19
Horticulturist	657	0.11	584	0.11	547	0.13
Textile, Clothing and Footwear	1 455	0.24	23 202	4.33	415	0.10
Airconditioning and Refrigeration Mechanics	527	0.09	891	0.17	367	0.09
Food	1 123	0.19	437	0.08	222	0.05
Manufacturing Technicians	247	0.04	142	0.03	91	0.02
Painting	11	0.00	17	0.00	30	0.01
Wood	7 702	1.27	152	0.03	12	0.00
Total	604 081	100.00	536 134	100.00	419 780	100.00

Source: DoE 2007

TABLE 11.16: *Occupation fields in which Level 4–6 learners in engineering studies have passed exams, accumulated total 1996–2005*

Occupation fields	Level 4		Level 5		Level 6	
	N	%	N	%	N	%
Electronics and Telecommunications	139 936	48.02	86 919	46.46	53 710	48.93
Construction	24 185	8.30	32 024	17.12	17 295	15.76
Mechanical Engineering	87 283	29.95	25 250	13.50	13 538	12.33
Electrician	2 341	0.80	18 890	10.10	9 212	8.39
Telecommunications	14 641	5.02	9 345	5.00	6 805	6.20
Manufacturing	13 980	4.80	6 442	3.44	4 815	4.39
ICT And Telecommunications	4 053	1.39	2 234	1.19	1 283	1.17
Mining	1	0.00	0	0.00	1 194	1.09
Chemical Technician	2 451	0.84	1 378	0.74	801	0.73
Manufacturing Technicians	0	0.00	0	0.00	538	0.49
Automotive Electricians and Mechanics	90	0.03	391	0.21	301	0.27
Wood and Paper Manufacturing	248	0.09	132	0.07	119	0.11
Textile, Clothing and Footwear	319	0.11	152	0.08	96	0.09
Aviation	360	0.12	49	0.03	41	0.04
Air-conditioning and Refrigeration Mechanics	157	0.05	45	0.02	20	0.02
Cad Draughtsman	0	0.00	2 197	1.17	0	0.00
Fabrication Engineering	1 340	0.46	1 616	0.86	0	0.00
Total	291 385	100.00	187 064	100.00	109 768	100.00

Source: DoE 2007

ship system and create a high-quality dual system of learning. Learnerships would be structured as a combination of unit standard-based structured learning and practical work experience that would lead to a qualification on one of the levels of the NQF and guarantee that the successful candidate was competent for a specified occupation.

The Green Paper stated that learnerships were being proposed as a 'major vehicle for addressing skills development needs'. It argued that traditional apprenticeships had been declining for a decade, which had been attributed to the economic downturn, rising costs, reduced incentives, inflexibility of design in the face of shifting skills requirements linked to technological change, and increased multi-skilling of lower levels in the workforce. The Green Paper pointed out that traditional apprenticeships would remain an important component of the new learnership system, but cautioned: 'However, the real

qualification value of apprenticeships will have to be reviewed in the process of standards setting and qualification restructuring' (DoL 2007: 54).

A learnership does not equate to a full apprenticeship. While traditional apprenticeships had, over the years, been reduced from a statutory seven years to a period of two to four years, employers had remained legally bound to ensure that an apprentice went through all the stages of apprenticeship. Learnerships effectively would allow employers to enter into a learnership contract with an apprentice for only one or perhaps two NQF levels. The learner or trainee has no guarantee that the employer will enter into a second or third learnership contract. Each NQF level is accessed through a new and separate learnership agreement. This would give employers in mass production, who have long complained that all-round expertise is no longer required in their factories, the opportunity to specify that a learner should be trained on only one or two machines, or in restricted but specialised work routines. This would ensure that more people could access training, but fewer would have the opportunity to attain the all-round knowledge and skill offered by the old apprenticeship system.

The Skills Development Act, finally promulgated in 1998, proposed that learnerships would incorporate traditional apprenticeships. It defines two types of learnerships:

- Section 18.1: learnerships entailing employed workers;
- Section 18.2: learnerships entailing unemployed learners.

The social partners made various commitments in this regard and set a target of 80 000 unemployed people to be enrolled on learnerships by 31 March 2005. This formed part of an attempt to use learnerships to address the unemployment problem, and was not necessarily concerned with raising the country's skill profile.

A total of 134 223 learnership agreements were concluded in the 4-year period of the first phase of the NSDS; 88 410 of these covered unemployed learners (exceeding the target set of 80 000), and 45 813 covered employed learners.

The majority of these learnership agreements are in non-technical fields and those that are related to artisan trades qualifications are at levels lower than those required for artisanal labour.

Factors behind the decline of apprenticeship

A historical overview of the evolution of apprenticeship training reveals that until the economy began to contract in the 1970s, the country relied largely on the supply of artisans produced by the SOEs and the importation of skilled (predominantly white) artisans, which would imply that the local supply has always been inadequate. Hence the current shortage, especially in relation to intermediate skills, cannot merely be the 'fault' of a new regulatory regime.

The new education and training dispensation, which emerged post-1994, was a response to a crisis which already existed. There was growing discontent with the traditional apprenticeship training system, viewed as a racially based system, which began to decline in prominence from the 1980s. Various studies have sought to explain the reasons for this; these include growing political instability, an economy in recession (growing at under 1 per cent per annum) but also facing structural changes (which impacted on the country's skills profile) that saw a shift towards services as mining and manufacturing began to decline in prominence. More importantly, the SOEs faced privatisation and commercialisation, and could no longer afford to train apprentices beyond their own needs for the broader economy. The huge capacity within the SOEs to train was mothballed. An International Labour Organisation report compiled by Bird (2001) reveals the extent to which the training of artisans declined in the SOEs.

Following the privatisation of Iscor in 1989, the training of artisans was reduced rather dramatically from 250 per year to 70 by 2000, in just one plant.

As highlighted above, the terrain for artisan training began to change dramatically from the 1980s and by the 1990s, with the drafting of a new education and training dispensation, the focus was not so much on artisan training as on producing skills for a more modern economy. There did not appear to be an appreciation of the value of the artisan, whose role had become intrinsically linked with the apartheid system. Instead, there appeared to be an unrealistic assumption that traditional artisan skills would not be required in the new economy, which would require 'smart skills'.

The decline in apprenticeship training has been exacerbated by the fact that a large number of the learnerships that were initiated from 2001 were at the lower (NQF Level 1) rather than intermediate skill levels. This may partly be a result of a drive by government to meet specific targets to employ unemployed youth, and for redress. The NQF Level 1 learnerships were bridging learnerships, which are critical if workers, previously denied access to training, are to have the opportunity of moving up the skills ladder. This level of learnership did not, however, address scarce or critical skills needs at the intermediate level.

The shortage of artisans in the South African labour market is also worsened by the insufficient co-ordination and relationship between the DoE and the DoL. An example of this disconnect was illustrated fairly recently when the DoE took a decision to change the curriculum of FET colleges.

Whilst there is a need to update current FET courses, business argues that transitional arrangements should be put in place or the new courses phased in, to allow those already in the system to complete their qualifications. The Steel and Engineering Industries Federation of South Africa's skills development head, Janet Lopes, commented that 'it seems problematic that at a time when shortages of skilled artisans present a key constraint to growth, the DoE is introducing new and unpiloted one-year vocational programmes at colleges without proper transitional arrangements for companies indenturing apprentices'.[5]

Concluding remarks

This chapter has shown that South Africa is experiencing a shortage of artisans in key technical fields at a time of economic boom, due to the decline in apprenticeship training over the last two decades. The problem has been worsened by the fact that some interventions, such as learnerships and FET college outputs, have not sufficiently resolved the artisanal skill crisis.

Data on FET exam passes confirm that an increasing number of young people are entering the labour market with artisanal-type skills, but face unemployment after graduation. The explanation is that employers perceive FET output as not providing the kinds of skills they require in industry. The FET college problem arises because many learners who are currently undertaking college studies within the priority areas do so with insufficient or no access to workplace experience. If these unemployed graduates or college learners who are engaged in basic technical and trades courses are put into skills programmes, that might go a long way in solving the skills crisis.

It has been established that there is likely to be an increase in apprenticeship training during economic boom periods and a reverse during recessionary periods. This is due to the fact that South African

5 Personal communication, July 2007

employers' decisions are generally short-term and cost-sensitive, and as a consequence, training plans are likely to fluctuate with changes in each company's economic performance.

It is this disharmony in the labour market which accounts for much of the employer rhetoric about a skills shortage. It is especially during the mini-boom periods that the consequences of cutbacks in training take effect, and cries of skills shortages emerge. The skills shortage crisis is really a by-product of insufficient long-term planning. At present, South Africa is experiencing economic growth ahead of the 2010 FIFA World Cup, hence the cry about acute shortages of skills in key technical fields.

The situation was compounded after 2000 by the apparent confusion surrounding the status of apprenticeship training following the promulgation of the Skills Development Act. In view of the apparent confusion around the status of the apprenticeship system and learnerships, among many other issues, it is questionable whether the proposed Skills Development Amendment Bill 2008 will actually resolve these issues.

References

Bird A (2001) *National monograph on technical and vocational training in South Africa*. Geneva: International Labour Organisation

Chisholm L (1992) South African colleges: Policy options. *Education with Production* 23(1): 195–233

Davies J (1984) Capital, state and educational reform in South Africa. In P Kallaway (ed.) *Apartheid and education: The education of black South Africans*. Johannesburg: Ravan Press

DoE (Department of Education, South Africa) (2007) *FET output 1996–2005*. Pretoria: DoE

DoL (Department of Labour, South Africa) (2006) *National Skills Development Strategy: Implementation report 1 April 2005–31 March 2005*. Pretoria: DoL

DoL (2007) *Green paper on a skills development strategy for economic and employment growth in South Africa*. Pretoria: DoL

Elliot G (2006) *MERSETA metal chamber: Scarce skills workshops April & May 2006 final report* Johannesburg: MERSETA

Gamble J (2004) Tacit knowledge in craft pedagogy: A sociological analysis. Doctoral thesis, School of Education, Graduate School of Humanities, University of Cape Town

Kraak A (2007) Three pathways to intermediate skilling. In A Kraak & K Press (eds) *Human resources development review 2008: Education, employment and skills in South Africa*. Cape Town: HRSC Press

Kraak A & Von Holdt K (1990) The training strategies of business and government: New opportunities for unions? *South African Labour Bulletin* 15(1): 16–21

LSC (Learning and Skills Council) (2005) *Skills in England 2004 Volume 1: Key messages*. UK: LSC

McGrath S (1996) Learning to work? Changing discourses on education and training in South Africa, 1976–96. Doctoral thesis, Edinburgh University

Moleke P (2006) Skill formation of artisans: The state of apprenticeship training in South Africa. Unpublished mimeo, HSRC

Mukora J (2006) Social justice goals or economic rationality? The South African qualifications framework considered in the light of local and global experiences. Doctoral thesis, Edinburgh University

Pandor N (2007) Address by the Minister of Education, Naledi Pandor, to the South African Colleges Principals' Organisation Conference, 30 August 2007, Johannesburg

Patel R (2007) Sectors strategically addressing critical and priority skills by assisting new entrants into employment and entrepreneurships. Powerpoint presentation at the SETA Skills Development Conference, 30 July 2007, Rustenburg

Quantec (2007) *RSA regional indicators*. Accessed September 2007, www.quantec.co.za/data

Stats SA (Statistics South Africa) (2005) *South African Standard Classification of Occupations (SASCO)*. Pretoria: Stats SA

The Presidency (Republic of South Africa) (2006a) *Annual report of the Accelerated Shared Growth Initiative for South Africa (Asgisa)*. Pretoria: The Presidency

The Presidency (2006b) *Annual report of the Joint Initiative on Priority Skills Acquisition (Jipsa)*. Pretoria: The Presidency

Vinjevold P (2007) FET college re-capitalisation. Powerpoint presentation to the Southern African Regional FET Conference of the International Association of Colleges (IAC), 15 November 2007, Boksburg

Young M & Gamble J (2006) *Knowledge, curriculum and qualifications for South African further education*. Cape Town: HSRC Press

Whyberd J (2007) *A strategy for programme-led apprenticeships in England 2007–2010*. Accessed July 2007, http://www.apprenticeships.org.UK/partners/apprenticenewsletter22AprilMay07

CHAPTER 12

City planners

Alison Todes

City planning is a small profession, with only 3 790 graduates by 2004. Data sources on the profession are limited, and there are only a few, mainly qualitative studies. 'Planning', as it is described in the Planning Professions Act (No. 36 of 2002), was designated as a 'scarce skill' in the context of the Accelerated and Shared Growth Initiative for South Africa (Asgisa) and the Joint Initiative on Priority Skills Acquisition (Jipsa) (Berrisford 2006; DoL 2006b). Lack of planning capacity was seen as constraining development in two main ways: through slow processing of land development applications, which was seen as holding up development; and through the lack of transformation of South African cities, perpetuating conditions such as long and costly travel to work, with impacts on labour costs. Further, the focus on infrastructure-led development would also require increased planning capacity.

The nature of planning work has evolved over time in South Africa, as it has internationally. Under apartheid, planning (then usually called 'town and regional planning') was focused largely on the design and layout of settlements, and on the management of land-use change, primarily in areas reserved for whites. Planning in the post-apartheid period is a far broader set of practices, and has diversified in various ways. While settlement design and land-use management are still significant, there is much greater focus on broader development agendas, including developmental and participatory approaches. Considerable attention is now paid to the development needs of the poor and to redressing the spatial effects of apartheid. Thus, strategic planning for the future development of cities, towns and regions is an important focus, as is the revitalisation of historically marginalised areas such as townships, informal settlements and rural areas. Planning of this sort includes not only physical design, but also the integration of policies, programmes and development initiatives within particular areas. Although planning, as defined in the Planning Professions Act (No. 36 of 2002), focuses largely on spatial planning, many planners are involved in far wider arenas. The development of statutory Integrated Development Plans (IDPs), intended to direct the work of municipalities and other agencies in their areas, has become an important focus area for planners, although other professions also work on this terrain. Many planners have moved into areas such as local economic development (LED), environmental management and housing. Planners have also played key roles in many of the area-based development initiatives, such as the special integrated presidential programmes (SIPPs), the urban renewal programmes (URPs), and the regionally based spatial development initiatives (SDIs). Thus planning as a field is relatively diffuse, and overlaps with other areas of skill and training, although there is arguably a fairly clear core.

In the late apartheid era, it was assumed that the demand for planners post-apartheid would grow considerably due to the diversification of the field and a focus on the needs of the majority, rather than the minority. A study of the demand for planners in 2001 (Todes et al. 2003), however, found that this

expectation had not been realised. The fact that planning has been defined as a scarce skill by Asgisa and Jipsa (DoL 2006b) suggests that this situation has since changed – that there might be a growth in the demand for planners which has not been matched by supply.

This chapter explores whether this is the case.[1] It uses data compiled by the South African Qualifications Authority (SAQA) (SAQA 2007) on graduates, supplemented with data from planning schools and previous research, to discuss supply issues. The Municipal Demarcation Board (MDB) and Local Government Sector Education and Training Authority (LGSETA) provide partial figures for conditions in local government, possibly the most important sphere of employment for planners (LGSETA 2006; MDB 2005–2006). Vacancy data, as reflected in advertisements for planners in the *Sunday Times,* provide some indication of trends (Erasmus 2008). Due to the paucity of hard data on the demand side, the research has relied on previous studies, documents and minutes from the Jipsa committee on town and regional planning, and on some 16 key respondent interviews with representatives of the planning profession and registration council, a selection of private consultants, senior planners in some of the metropolitan municipalities and provincial governments, and some researchers and academics who are close to these processes.[2]

An overview of planning and the planning profession

In 2002, the Planning Professions Act defined planning as follows, after much debate:

> the initiation and management of change in the built and natural environment across a spectrum of areas…in order to further human development and environmental sustainability, specifically in the fields of:
> (i) the delimitation, regulation and management of land uses;
> (ii) the organisation of service infrastructure, utilities, facilities, and housing for human settlements; and
> (iii) the co-ordination and integration of social, economic and physical sectors which comprise human settlements, through the synthesis and integration of information for the preparation of strategic, policy, statutory and other development plans within the South African development context.

Planning, according to this definition, is concerned with land development, with the management of change on a day-to-day basis, and with proactive future planning. Its function is to co-ordinate and integrate development.

Many planners work beyond this realm, most importantly in IDP planning, which deals with the overall priorities and development directions of a municipality, and its appropriate management. IDPs are also intended to play a key role in inter-governmental planning and co-ordination. This broader sphere of planning, however, is also occupied by other professionals. Similarly, planners work alongside professionals with other skills bases and training in areas such as LED, housing and environmental management.

In the recent deliberations of the Standards Generating Body (SGB) for planning, spatial planning was seen as the core focus for planning education, and also as the main set of skills that are seen as being in

1 This chapter draws on a longer report by Alison Todes and Nelisiwe Mngadi (Todes & Mngadi 2007). Thanks to Gill Lincoln, Vanessa Watson and Phil Harrison who read and made comments on a version of the longer paper.
2 Details of interviewees are listed at the end of the chapter.

short supply, although commentators also point to a shortage of LED practitioners (Davies interview), and weaknesses in the capacity of those undertaking IDPs (Coetzee interview).

The Planning Professions Act provides for the registration of planners, and allows for work reservation, although none exists at present. The previous Town and Regional Planners Act (No. 19 of 1984) did not reserve work for planners. The South African Council for Planners (SACPLAN) was established in 2004 in terms of the 2002 Act, replacing the previous South African Council for Town and Regional Planners (SACTRP). SACPLAN is responsible for the registration of planners and the accreditation of planning education, inter alia, but has taken some years to be established. By June 2007, 1 300 planners were registered, well below potential. There is little to compel registration or the use of registered planners, although this is likely to change in future. The effective 'deprofessionalisation' of planning is a concern for SACPLAN, and for the South African Planning Institute (SAPI), which represents the profession.

The 2002 Act provides for the registration of two categories of planners: technicians and professional planners. Registration in either category requires education through a SACPLAN-accredited training programme at tertiary level (to National Qualifications Framework (NQF) Level 6 for technicians, and NQF Level 7 for professional planners), two years of practical training, and the passing of a competency test, although this latter provision has not yet been implemented. There are four main educational routes towards registration:

- A three-year national diploma in planning (including a year of supervised on-the-job experience) leads to registration as a technician.
- These graduates may go on to study towards a bachelor of technology (BTech) in planning, which, under the 2002 Act, leads to professional registration. This differs from previous practice, whereby a university degree was required.
- A four-year undergraduate/honours degree in planning leads to professional registration.
- A two-year master's degree in planning, which is open to graduates from other disciplines, leads to professional registration.

Planning educators face a difficult task since the range of skills required for planning is diverse, and the field has broadened significantly over time. A set of broad competencies were developed by planning schools in 2000, and their validity was generally confirmed in a study of employers by Faling (2002). The formal process of defining competencies through a SGB was delayed, and the process is still in its early stages. Thus agreement on the range of skills and competencies required has still to be established, although there seems to be consensus that the focus should be on spatial planning. This is also likely to be the arena in which any job reservation for planning will occur.

Institutionally, SACPLAN and the 2002 Planning Professions Act fall under the Department of Land Affairs (DLA).[3] The DLA is also responsible for the Development Facilitation Act (No. 67 of1995), interim legislation which remains to be replaced by national legislation on spatial planning and land-use management. A White Paper on Spatial Planning and Land Use Management was passed in 2000 (DLA 2002). In the absence of national legislation, the complex, fragmented and unequal system of apartheid land-use management remains – a concern also raised by Asgisa (South African Government Information 2006). Planning is a small component of a department that is concerned primarily with agriculture and land reform. Planning in the form of IDPs has been a major focus of the Department of Provincial and Local Government (DPLG), as has urban renewal, while responsibility for sustainable human settlements falls under the Department of Housing, and environmental impact assessments, which overlap significantly with assessments of planning applications, fall under the Department of

3 This has been the case for historical reasons. Most professions in the built environment fall under the Council for the Built Environment in the Department of Public Works.

Environmental Affairs and Tourism. The effective fragmentation of responsibility for planning, and the lack of a strong institutional base for it, has long been a concern for the profession.

Assessing the shortfall of planners

The size of the planning profession

Some 1 300 planners were registered with the SACPLAN in April 2008 (SACPLAN 2008), while 1 599 people were members of the SAPI in June 2007. The Association of Consulting Town and Regional Planners (ACTRP), representing private firms, had 220 members, and each firm is likely to have at least 2.5 principal planners (Dacomb interview), so firms registered with the ACTRP are likely to have at least 550 planners, in addition to junior planners. No gender or race breakdowns were available for these groups. However, many planners are not registered with any institution. In 1999, for example, a survey of planners known to be operating in KwaZulu-Natal (Harrison & Khan 2002) found that only 63.5 per cent of them were registered with the then SACTRP, and only 44 per cent of planners were members of the SAPI.

The SAQA graduate database provides the best source of data on the likely number of planners in South Africa, incorporating data from 1965 to 2004 (SAQA 2007). In their data, there were some 3 790 graduates by 2004, although not all would have had qualifications that made them eligible for registration. A further 301 planners graduated in accredited, and 31 in non-accredited, programmes in 2005 and 2006, according to data from planning schools. Thus the total number of planners in 2006 would have been about 4 125. These figures do not take into account those who have retired, have left the profession, or have emigrated. There are no available figures on any of these categories. While the numbers of the former are likely to be small, since the real growth of the profession and of graduate numbers has occurred since the 1980s,[4] anecdotal evidence suggests that both the numbers leaving the profession and those emigrating are likely to be significant, particularly since the demand for planners in English-speaking countries such as Australia, New Zealand, Ireland and the UK has been high in recent years.

Some 71 per cent of planners who had graduated in South Africa by 2004 were white and only 19 per cent were African (and 9 per cent were coloured or Indian) (Table 12.1). Although there is an overwhelming dominance of whites in planning, the picture has changed since 1994, at which time 90 per cent of planners who had graduated were white. Under apartheid, Africans had to apply for permits to study planning, since courses were offered by institutions which were designated for whites only, and the first African planner only graduated in 1981 (Badenhorst 1995). Since the early 1990s, however, the number of black (that is, African, coloured and Indian) students in planning schools has increased significantly, rising from 30 per cent in 1994 to 78 per cent in 2003 (Todes & Harrison 2004). This shift is beginning to be evident in graduate numbers, where the proportion of white graduates dropped to 30.7 per cent by 2004 (Table 12.2). The SAQA figures also show a rising proportion of women in planning, although they accounted for only 34 per cent by 2004 (SAQA 2007).

Planners work in a range of spheres, both public and private, but no figures are available on the distribution between the two. Badenhorst's (1995) survey of SAPI members showed a shift away from planning as a predominantly public-sector activity in 1983 towards the private sector in 1993, with 47.7 per cent in the private sector, 40.6 per cent in the public sector, and 11.4 per cent in other organisations. By 2001, this picture had changed, with a decline in the number and size of the private sector (Todes et al. 2003).

4 Several of the planning schools were only established after the late 1970s.

TABLE 12.1: *Cumulative total of planning graduates in South Africa, by race, 1994 and 2004*

	1994		2004	
	N	%	N	%
African	112	5	721	19
Coloured	24	1	148	4
Indian	55	2	172	5
White	2 009	90	2 702	71
Unknown	44	2	48	1
Total	2 244	100	3 791	100

Source: SAQA 2007

TABLE 12.2: *Graduates, by race, 1994 and 2004*

	1994		2004	
	N	%	N	%
African	47	23	85	56
Coloured	3	1	16	10
Indian	9	4	5	3
White	148	71	47	31
Unknown	1	1	0	0
Total	208	100	153	100

Source: SAQA 2007

This situation seems to have changed again, and all private-sector firms interviewed reported a huge growth in demand for their services, and that of the planning private sector in general.

Within the public sector, most planners work in local government, but there are also substantial numbers in provincial planning (and sometimes in housing, environment and economic development) departments, and in national government. Planners are also employed in parastatals, academic and research organisations, and in NGOs. According to MDB material published in 2005–2006, which provides data for the 272 non-metropolitan municipalities, some 682 people were employed to undertake the planning function and a further 232 were brought in as and when needed (MDB 2005–2006). Thus a total of 914 people were employed in local government outside the 6 metropolitan municipalities, although this number includes people in planning departments who are not necessarily planners. It is estimated that about 380 people are employed in planning positions in the metros .[5]

5 This estimate is based on figures for eThekwini and the City of Johannesburg, which each have approximately 70 planners. These figures differ from numbers for planning departments, which are far larger. It can be expected that the Nelson Mandela metro will have far fewer planners.

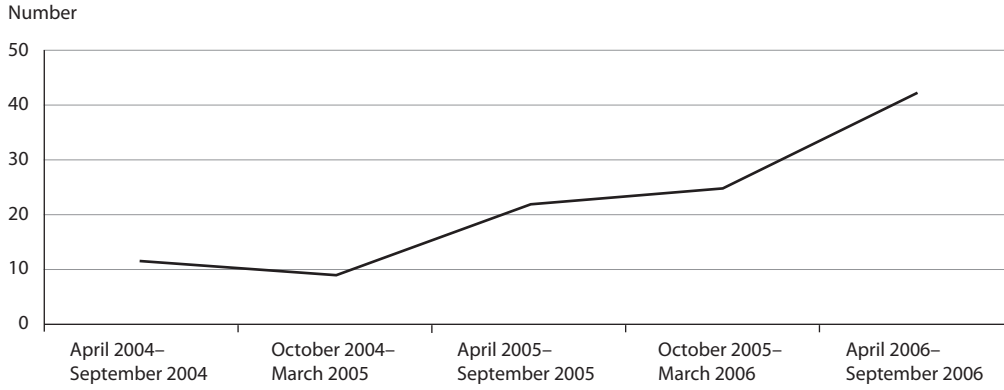
Vacancy data

There are no good sources of data on vacancies for planners. The LGSETA records a need for 300 planners[6] (Davies interview), but this reflects departmental needs, and includes a range of other skills such as building plan inspectors, who are not necessarily planners. MDB data for local government similarly reflect 310 municipal planning vacancies outside metropolitan areas, again at departmental level. Numbers may, however, under-reflect the need, since positions that are taken by unqualified people will not be shown as vacancies (Davies interview). LGSETA data are used as the main source for the Department of Labour's (DoL) *Master List of Scarce and Critical Skills* (DoL 2006a), although the list incorrectly records this figure as 50. A shortage of planners is also flagged here by the Construction SETA and the Department of Science and Technology. No other official data sources exist on whether planning is in fact a scarce skill, or on the size of the shortage.

The DoL's database on vacancy advertisements from the *Sunday Times Business Section* (Erasmus 2008) was analysed for the period April 2004–September 2006 for South African Standard Classification of Occupations (SASCO) numbers 2141, 3118 and 3119 (Stats SA 2005).[7] The analysis may, however, have missed advertisements classified under other SASCO numbers.[8] Further, many organisations do not advertise in the *Sunday Times* as it is too costly, and recruitment often occurs through networks and local advertising. Over the period of study, April 2004–September 2006, some 109 jobs were advertised. Importantly, the number of job advertisements grew over the period of study (Figure 12.1), suggesting a rising demand for planners.

Unfortunately, information provided on qualifications, experience, employer and location in the DoL database is not complete, but available data indicate that most employment advertised in this way is for middle- to senior-level professional planners, in the public sector, and primarily in municipalities.

FIGURE 12.1. *Advertisements for planners, April 2004–September 2006*



Source: Erasmus 2008

6 Based on data submitted by municipalities, mediated by provincial workshops. Not all municipalities submitted information. The City of Cape Town, which has a significant shortage of planners, did not submit information.

7 These numbers cover the following categories: architects, town and traffic planners (2141); draughtspersons (3118); physical and engineering science technicians not elsewhere classified (3119). The job titles in the advertisements were all for planners, however.

8 For example, the DLA advertisements for planners are excluded.

Qualitative insights

While the data above suggest that the shortfall is probably small, if it exists at all, interviews and other evidence suggest that the problem may be deeper than appears at first sight. Unfortunately, no norms have been established with regard to the number of planners that are needed. This is a significant gap in assessment of the shortage of planners.

Local government is probably the most important sector where planners are employed. Interviewees argue that while capacity shortfalls for planning exist in all types of municipalities, conditions are generally better in the metros, and worse in the smaller and more rural municipalities. None of the metros researched as part of this study, however, are employing the full complement of staff on their organogram. In all three cases, the process of amalgamation of various entities in 2000 had led to a moratorium on employment of planners and/or a decline of planner numbers, as very slow processes of replacing staff were coupled with significant attrition of planners. Capacity levels dropped substantially, and together with cumbersome regulatory systems, resulted in slow processing of development applications (Sim et al. 2004).

Since then, Johannesburg has been able to argue for significant increases in employment, and is now at around 75 per cent of capacity. Gaps exist primarily at the level of more skilled and experienced staff. Although it would be possible to find staff to bring numbers up to 100 per cent, it would be difficult to find the level of skills and experience needed. Turnover is high, with significant competition for staff among the three metros in Gauteng.

In eThekwini, capacity levels have recently increased from 50 per cent to 60 per cent. They would like to move to 75 per cent of capacity, but there are budget constraints, and they want to avoid bringing in inexperienced staff who cannot be mentored and managed. Experienced and skilled planners are not easily available. Further, despite staff shortages, some staff under-perform, and there is an unwillingness to employ additional staff who might be unproductive. Nevertheless, capacity constraints are affecting the quality and efficiency of planning and environmental assessments. This has been exacerbated by the growing number of applications.

The City of Cape Town is experiencing a significant capacity constraint, particularly as the strength of the building boom has placed huge demands on the municipality, but has also expanded the demand for private-sector work and hence the competition for planners. Capacity levels are at around 35–50 per cent, depending on the unit, and jobs are being advertised nationally to find the necessary skills.

The situation is worse outside the metros, particularly in more rural and peripheral municipalities, although some larger cities also face serious shortages of planners. For instance, in Buffalo City, some 47 per cent of the 36 planning positions were vacant in 2005 (MDB 2005–2006). A staff of 14 (3 planning professionals and 11 technicians) are responsible for land-use management for a population of 702 279. Parnell et al. (2007) comment that most of these staff members came from the previous East London Transitional Council, and might have been adequate for this area, but they now have to cover a far larger area, including King Williamstown, Bisho and large rural and semi-urban areas. Planners now have to deal with legislation covering all of the previous entities, and are greatly stretched in this context. Staff turnover is high, and the training of new staff takes time and resources.

MDB data also show that while almost all municipalities provide a planning function, only 30 per cent say that they have adequate staff to perform the function, and 58 per cent say that they do not have adequate staff to do so.[9] Some 20 per cent have no full-time staff and rely entirely on external providers.

9 The remaining 9.6 per cent did not respond to the question.

Insufficient staff (often in combination with insufficient budgets and/or equipment) is a reason for a failure to provide a planning service to all parts of the municipality in 30 per cent of municipalities. Although municipal capacity reports indicate that most municipalities have some capacity to deliver the planning function, it is problematic or uneven in several districts.

A large number of IDP managerial posts are not filled, and people in this position frequently have limited experience and qualifications. Some 62 per cent of IDP managers have 5 years or less experience in local government, and only 14 per cent of IDP managers have experience related to planning and development.

A study of municipal development planning capacity in seven municipalities in KwaZulu-Natal found that in most districts there is a lack of spatial planning capacity, and a lack of staff with relevant planning qualifications (Ovens 2006). There is an absence of experienced personnel who can do the integrated and strategic planning that is required in terms of current legislation. Thus work undertaken tends to meet minimum legal requirements, rather than fulfilling actual intentions. Although posts might be filled, staff are not necessarily appropriately qualified, and there has been a tendency in some places to fill positions on a political basis, rather than according to appropriate qualifications and skills. Further, municipal managers do not always understand the planning function and what is required, and do not give it the attention or support it needs. Only a small proportion of staff has a planning qualification, and in some cases, staff employed have a lower level of qualification than that required. Where planners are employed they are usually overworked, and vacant posts are common. Municipalities also lack enforcement capacity. In some municipalities, all planning is outsourced to the private sector, raising potential conflicts of interest when the same firm acts for private developers as well as for the municipality.

A study in 2003 by the Council for Scientific and Industrial Research (CSIR) on IDP capacity (Coetzee & Van Huyssteen 2004) found significant deficits in municipal capacity. The study found that only 7 per cent of municipalities were able to undertake and implement a good IDP, while 20 per cent lacked the basic resources to do so, and 53 per cent required support to produce one. The remaining 20 per cent were able to produce a good basic IDP, but were unable to implement it (Coetzee & Van Huyssteen 2004). Provincial capacity to support IDPs in many provinces was also seen as wanting, with understaffing, lack of skills and experience, and high staff turnover.

A recent report on urban land management (Parnell et al. 2007)[10] found that the limited number of planners at provincial level was a problem, as it resulted in a slowing down of planning approvals. For instance, Gauteng province has a two-year backlog of applications to process, due to capacity constraints. A similar situation pertains in KwaZulu-Natal and the Eastern Cape. In the Eastern Cape, there are only three planners covering the needs of the whole province, while in KwaZulu-Natal there were only seven qualified planners in early 2007. In the case of KwaZulu-Natal, capacity constraints are the result of a three-year moratorium on employment in the context of departmental reorganisation, and these levels are seen as way below needs (Brooks interview). Although a new organogram is being approved, recruitment processes could lead to it taking up to a year to fill new posts. Nevertheless, this department at least has several staff at senior level who are highly experienced. Western Cape provincial departments dealing with planning also note shortages of planners and difficulties in recruiting them, particularly at more senior levels. Junior staff often stay only for short periods of time and then move to other parts of the country.

10 The study focused on Johannesburg, eThekwini, Buffalo City, Mangaung and Cape Town.

Several interviewees argued that in many municipalities and provinces, the need for planners is not recognised or understood. Thus staffing levels are low, and the range of tasks that planners might perform is neglected. Some argued that several national departments would also benefit from a greater use of planners, with their potential to co-ordinate across sectors, institutions and spatially.

In general terms, planning shortages are at the level of more skilled and experienced people, rather than at entry level. Given that black planners have only recently come into the profession, the shortage of black planners at this level is particularly notable. There has been a tendency to push graduates into positions well beyond their levels of experience, and given shortages, there is often insufficient mentoring. The private sector also experiences constraints in their capacity to mentor new staff, and some have difficulty in finding experienced planners, particularly black planners. One respondent commented that they could not compete with the much higher wages in the public sector. Others point to the difficulty of finding middle- to senior-level staff who can run projects. Some firms experienced difficulties in finding particular sets of skills, and a few respondents are employing people with qualifications outside of planning, either due to the skills needed (for example, architects) or due to their availability. In several cases, planning firms have remained relatively small, and senior planners frequently set up on their own, although firms have grown in recent years.

Although there are still many problems with the skills available for production and implementation of IDPs, most respondents argued that it is particularly spatial planning skills that are in short supply, ranging from strategic planning, to land-use management, to practical design and implementation.

Explaining the shortage of planners

Contextual conditions

In the transition from apartheid to democracy, it was assumed that a much larger number of planners would be required for a wide range of purposes, inter alia, to work with communities in developing plans to improve local physical as well as social and economic conditions; to plan new development areas; to plan for the integrated development of towns, cities and regions; to undertake more developmental and participatory planning; to unify land-use management systems and to reconstruct them in terms of a different set of values. In practice, it has taken some time for these predictions to be realised, and in the interim, the demand for planners declined until 2001 (Todes et al. 2003).

While much of the legislation is now in place to move in these directions, it has taken some years for this to occur. Legislation for IDPs and spatial frameworks has only been in place since 2000, and legislation on land-use management is still outstanding. In the early post-apartheid period, the main focus was on delivery, particularly of housing and services, and while many planners were employed in relation to housing development, there was less emphasis on integrative planning. In many cases, the outcome of such development was to exacerbate apartheid divides. Land-use management was almost entirely neglected, with a greater planning focus on facilitative, developmental planning (Harrison et al. 2008).

For some stakeholders, planning was associated with apartheid, and its potential for assisting in transformation was not recognised; thus it was downgraded in importance (Ovens interview). Authorities emphasised that IDPs were management rather than spatial plans, and spatial planning tended to be marginalised. Some of the large integrated projects, such as the Katorus, Alexandra and Cato Manor Development Projects, all of which were Presidential Lead Projects, nevertheless did provide an alternative approach to planning, even if results were less transformative than had been desired (Robinson et al. 2004). The marginalisation of planning, and the difficulties experienced in moving towards desired

ends, did however contribute to a loss of image and identity of the profession (Harrison & Khan 2002). Planning did not benefit from the growing sustainability agenda, which has in part underpinned its resurgence internationally, as environmental management developed in parallel to planning, although some planners went into this field.

In addition, in the early post-apartheid era, the economy grew slowly, and plans for housing and service delivery took some time to be realised, affecting the demand for the traditional areas of work of planners. The private planning sector came under pressure in this context, and many firms declined in size or disappeared (Todes et al. 2003).

Local government, the main employer of planners, was subject to two rounds of reorganisation in 1996 and 2000. In many cases, these processes were associated with an initial freezing of positions which, in some cases, lasted several years. In some municipalities, constant political change also underpinned instability in employment of planners, amongst others. In these conditions, numbers of planners in several municipalities declined as experienced people left, and were not easily replaced. Within local government, employment of planners was affected by a relatively unskilled and inexperienced management (LGSETA 2006) and new councillors, who did not understand planning, and the skills required. The employment of un- and under-qualified people occurred in this context.

Harrison and Khan's (2002) study of planners in KwaZulu-Natal in 1999 found that while most were positive about change, they experienced difficult working conditions. Key problems included the confusion caused by rapid change in legislation and procedures; increasing work pressures and workloads; the weakness of the bureaucracy dealing with planning; affirmative action influencing promotion and appointment prospects; the low status of planners; poor financial rewards; the time-consuming and difficult nature of community participation; and negative attitudes towards consultants. The responses also reflected a predominantly white planning profession: black planners were far more optimistic. These perceptions are likely to have affected the numbers of entrants going into planning, particularly amongst whites, and are also likely to have contributed to movement into fields other than planning, and to emigration to places where planning is on the rise as a profession.

Since about 2002, the demand for planners appears to have grown. Perhaps the key reason is the boom in the economy, a strong element of which has been a property boom. There has been a significant growth in the number of applications for new developments, and thus demand for increased capacity to process these applications. The construction and property boom has been particularly strong in the major metros, and in Cape Town, interviewees argued that it is responsible for a significant growth in the demand for planning work and planners. This growth in demand affects both the private sector, which would be involved in submitting planning applications, and the public sector, which has to assess and respond to them. For instance, in KwaZulu-Natal, the provincial Department of Local Government and Traditional Affairs has faced a rapidly increasing number of planning applications that need to be assessed. The value of applications has increased from R5 billion in 2004/2005, to R7 billion in 2005/2006, to R15 billion in 2006/2007 (Brooks interview).

In addition, rapid growth in new development areas is highlighting the need for proper spatial planning at a regional and sub-regional scale. For instance, in Gauteng, rapid but fragmented growth without appropriate macro- or even local planning occurred in the area between Johannesburg and Pretoria. The lack of adequate infrastructure and facilities and the associated congestion (inter alia) are factors leading to the emerging crisis in this area, for instance in Fourways. In eThekwini, the rising number of development applications in the Hillcrest/Kloof area led to a moratorium on approvals and the development of a detailed plan in terms of which applications could be assessed. In Cape Town, there is increasing demand for spatial planning frameworks from communities, portfolio committees

and developers who want greater certainty about how particular areas are to be developed over the long term (Southworth interview). More generally, there is growing recognition of the need to move beyond the rather broad spatial development frameworks which were developed in the 1990s, to better researched and detailed planning, which is increasing the demand for planning work and hence for planners.

The current emphasis on infrastructure-led development is also leading to a growing demand for planners to plan for new developments and to respond to plans. For instance, planners have usually been involved in planning for major developments such as 2010 in diverse ways: in overall planning for the event in cities and initiatives to create a 'legacy' for the city; in redevelopment of areas around the stadia; in planning of the stadia themselves; and in planning applications linked to these developments. Similarly, planners are involved in projects such as the proposals for the new airport in Durban – in its design, in debates over the airport and the way it is developed, and in assessing and planning for its impact in the city.

Although national planning legislation is still outstanding, parts of the planning system are beginning to be put in place, and the various administrative requirements for IDPs, spatial development frameworks and land-use management systems (in some provinces) are coming through. In addition, now that a level of delivery has occurred, there is growing concern in government with the quality of delivery, and the quality of places which are being created. There are several initiatives to address these issues (for instance the urban renewal nodes), all of which are leading to a growth in demand for planning work, both within the public sector, and outside of it. More generally, there is growing acceptance of the contribution that planning can make to transformation, and this is leading to a greater demand for planners, although there are also fears that expectations are overstated and that, given the complexity and difficulty of development, disappointment is inevitable (Oranje interview).

The supply of planners

Table 12.3 and Figure 12.2 show the number of planning graduates, by type of qualification, from 1995 to 2004. Overall, the decline in the number of graduates from 1995 to 2004 is striking, suggesting that there may well be a supply problem. The decline in graduates is particularly evident for master's students, and for university-based bachelor's and honours degrees. At the same time, the number of graduates in National Diplomas and BTech degrees has increased, suggesting a shift from planning education based at universities to that offered at universities of technology, but this does not make up for the overall decline in output. If BTech graduates and bachelor's and honours degrees are taken together as the main graduate output for NQF Level 7,[11] there is an overall decline in graduate numbers from 1995 to 2004, albeit with a spike in 1998.

These figures are broadly consistent with trends noted by Todes and Harrison (2004), based on overall student numbers sourced from planning schools for the 1994–2003 period. They attributed the decline in student numbers at universities to the market for planning, the rapid growth in employment in better paid fields such as business and computer science, and the growth of alternative outlets for students with similar interests, such as development studies and environmental management. These patterns do, however, seem to be changing.

Data from planning schools on intake, student numbers and graduates over the 2005–2006 period (Table 12.4) suggest that both intake and graduate numbers have increased. There has been a significant increase in applications for places, and students are finding it easy to access employment.

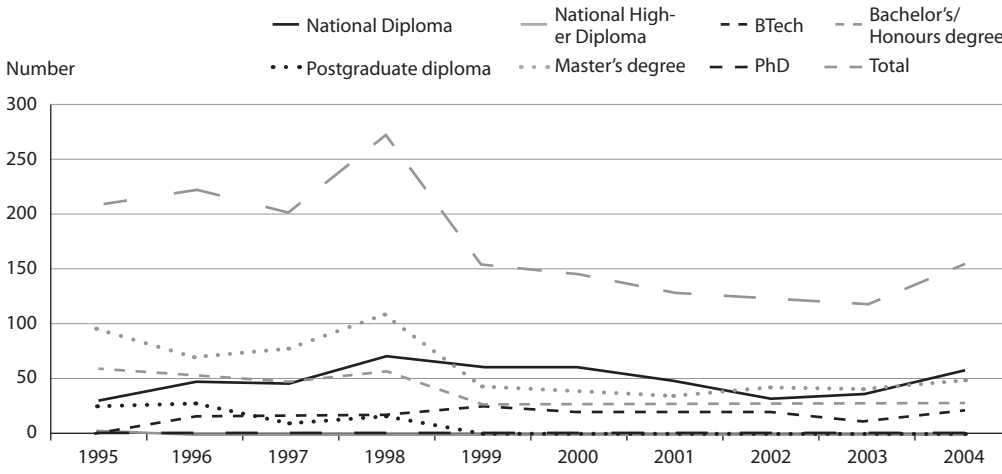
11 National Higher Diplomas were discontinued after 1994, and were replaced with the BTech.

TABLE 12.3: *Number of planning graduates, by qualification, 1995–2004*

NQF level	Qualification	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
6	National Diploma	30	46	46	71	59	61	49	32	36	57
7	National Higher Diploma	2	0	0	0	0	0	0	0	0	0
7	BTech	0	17	17	18	26	21	20	20	12	22
7	Bachelor's/honours degree	60	56	48	58	27	27	26	30	30	28
7	Postgraduate diploma	23	30	10	17	0	0	0	0	0	0
8	Master's degree	94	70	77	107	43	37	33	41	39	46
8 +	PhD	0	3	2	0	0	0	2	1	0	0
	Total	209	222	200	271	155	146	130	124	117	153

Source: SAQA 2007

FIGURE 12.2: *Number of planning graduates, by type of qualification, 1995–2004*



Source: SAQA 2007

The decline of graduates from universities, particularly at postgraduate level, is of concern. In the past, the work of technicians and professional planners was clearly demarcated, although there has always been movement in the system, with technicians becoming professional planners over time. In the current environment, differentiation of work occurs in various ways across institutions, but there is also greater fluidity, in part due to the lack of professional planners (Watson 2006). Current demands are both for planners with a stronger technical base, and also for deepening and extending strategic planning, which requires a combination of high-level conceptual and analytical skills, amongst other

TABLE 12.4: *Planning graduates, 2005–2006*[a]

Qualification	2005	2006
National Diploma	72	77
BTech	25	50
Bachelor's/honours degree (university)	40	54
Master's degree	38	54
Total (all degrees/diplomas)	175	235

Source: Data supplied by planning schools

Note: a. Excludes thesis master's and PhD graduates. Includes non-accredited degrees.

things. In addition, the quality of planning is lacking, and processes currently treated in a mechanistic way in some contexts (such as land-use management) require the application of complex knowledge and judgement.

The impact of capacity shortfalls

Current expectations of the planning system are ambitious. Concerns have been raised about the lack of integrated development across spheres and sectors of government, and planning is seen as playing a key role in promoting integration. Intentions to create an intergovernmental system of planning, linking the work of national and provincial departments to provincial and local plans, as well as to the National Spatial Development Perspective (NSDP), are affected by planning capacity, inter alia.

Linking the NSDP to provincial and local plans requires a good understanding of the space economy and an ability to think in spatial terms. These skills are lacking, affecting not only the production of provincial growth and development strategies, but also the way sectoral departments relate to these processes. There is also a deficit of people with the skills to develop terms of reference for such exercises, and to lead and manage these processes (Coetzee interview).

A critical issue is that the quality of planning and decision-making is inadequate. Since 1994, there has been a slew of legislation attempting to engender a planning system which promotes development and sustainability. This system includes a new set of values and approaches, which requires that planners are able to exercise judgement in terms of normative principles, to involve communities and other stakeholders in planning processes, to think strategically, and to plan in ways which bring together various sectors and agencies. Creative and synoptic thinking is required. The new approaches to planning are therefore predicated on the existence of planners who are relatively skilled, and they are demanding in terms of time.

Lack of capacity is thus being seen as a major reason for the poor quality of IDPs and spatial frameworks. Properly developed IDPs and spatial frameworks should provide a clear future development path for a municipality, its key priorities and values, and its major programmes into the future. Spatial frameworks should indicate where and how development should occur in space, and the phasing of various developments. They should provide a co-ordinating tool for infrastructure and property development, and a basis for site-level decision-making. In the absence of strong and defensible plans, as is frequently the case at present, there is a lack of co-ordinated development, and disjunctures between the places where various types of infrastructure are provided, and those where development occurs.

Social goals such as restructuring the city away from its apartheid legacy are also more difficult to achieve in a context where land development decisions are made on an ad hoc basis, often in favour of property developers. At the same time, there is no certainty for property developers on how particular developments are likely to be viewed. Arguably, several of the facilities and services crises in Gauteng province and other cities, such as congestion in some areas, and the absence of schools, inadequate sewerage and energy capacity in others, are the result of the lack of planning and inadequate co-ordination between agencies responsible for infrastructure development.

Decision-making about land development applications is also often done in a mechanistic way, without reference to the range of norms and principles contained in policy and legislation (Sim et al. 2004). Lack of capacity is affecting the time taken to process planning applications, and thus investment. This problem is exacerbated by the current complexity of the legislative system and by capacity limitations in departments outside of planning, which comment on applications.

Planning potentially plays an important role in redeveloping or designing parts of cities, yet this aspect has not been sufficiently recognised, and there is an under-investment in the design of low-cost housing settlements. Lack of capacity in planning also affects the quality of work undertaken in various developmental initiatives.

Finally, the long-term viability of the planning system is threatened by lack of capacity to mentor and monitor staff. Initiatives to provide support also depend on capacity. For instance, centres established to support integrated development planning were only successful in the 15–20 per cent of districts where they were able to attract skilled and experienced staff (Coetzee interview).

Conclusion

While policy and legislation since 1994 seemed to broaden and elevate the role of planning, in practice, planning went into decline for several years. The immediate demands of delivery, institutional restructuring, and an association of planning with apartheid in the minds of some stakeholders tended to marginalise its importance. There is, however, growing recognition of its significance for government's attempts to create more integrated development, and more sustainable and liveable cities and regions. Coupled with economic growth, and in particular, the property boom, which has led to a rapid rise in land development applications, the demand for planners is on the increase.

The evidence available suggests that there is a shortfall of planners, although it is difficult to quantify its extent. There is a small number of vacancies, according to official sources, but importantly, the need for planners has not been sufficiently recognised, leading to an under-use of planners in a variety of areas. In addition, the need for planners is masked by the employment of people who have neither the qualifications nor the experience for their positions. There is a need to benchmark the number of planners required against international practice.

The demand for planners is for skilled and experienced professionals. Emigration, attrition from the profession, and movement out of the public sector have contributed to deficits here. The lack of value accorded to planning for many years, and opportunities elsewhere, are factors. New or recent graduates are being put into positions without sufficient experience or mentoring. Capacity deficits are worse outside the cities, particularly in rural areas. Nevertheless, the cities are under pressure as a consequence of the property boom, and the complex development pressures that they face.

Although the capacity deficit is primarily at the level of more skilled and experienced planners, the decline in the graduate output of planning schools does seem to have been a contributing factor. Both

student numbers and quality declined for several years – seemingly the effect of the shrinking market for planners, opportunities in other areas, and the image of planning. Numbers are growing again, but there is a need to improve the status and profile of planning to enable it to attract stronger students.

Capacity shortfalls affect the extent to which planning is able to play its intended role in development, as well as the quality of planning, and the time taken to process applications. The concerns raised by Asgisa do seem to be justified in this context.

Yet as several commentators have noted, there is a host of other problems affecting planning in the current environment: the lack of an adequate legal framework for planning, institutional problems, and the broader capacity of the public sector, amongst others. While rationalisation of planning systems will improve efficiency, it is unlikely to lead to a significant reduction in the need for planners. Initiatives elsewhere to consolidate fragmented systems have not generally led to a reduction in the need for planners, and the introduction of new systems generally makes increased demands on capacity, as new processes, procedures and ways of understanding and assessing are introduced (see, for example, Todes et al. 2007 on New Zealand).

Thus planning capacity does need to be built, particularly within the field of spatial planning. Initiatives to address capacity issues will require resources, and will depend on acknowledgement of the importance of planning, a strong institutional base for taking forward proposals, and co-operation between various stakeholders.

References

Badenhorst M (1995) The changing profile of town and regional planners in South Africa. *Town and Regional Planning* 38: 13–22

Berrisford S (2006) Towards a Jipsa business plan for strengthening urban planning skills in South Africa. Report to Jipsa

Coetzee MJ & Van Huyssteen E (2004) Intergovernmental planning support strategy. Unpublished report for the Department of Provincial and Local Government. Pretoria

DLA (Department of Land Affairs, South Africa) (2002) *White paper on spatial planning and land use management*. Pretoria: DLA

DoL (Department of Labour, South Africa) (2006a) *Master list of scarce and critical skills*. Pretoria: DoL

DoL (2006b) *National scarce skills list (Asgisa aligned)*. Accessed 29 February 2008, http://www.labour.gov.za/useful_docs/doc_display.jsp?id=11696

Erasmus JC (2008) Vacancy Analysis Report. Report on Phase 3: A survey of employers who have recently advertised vacancies. In Project 4.1: A multiple source identification and verification of scarce and critical skills in the South African labour market. Commissioned by the Department of Labour, Pretoria

Faling W (2002) The relevance of planning education in South Africa. Unpublished master's thesis, University of Natal, Durban

Harrison P & Kahn M (2002) The ambiguities of change: The case of the planning profession in the province of KwaZulu-Natal, South Africa. In A Thornley & Y Rydin (eds) *Planning in a global era*. Aldershot: Ashgate

Harrison P, Todes A & Watson V (2008). *Planning and transformation: Learning from the South African experience*. London: Routledge

LGSETA (Local Government Sector Education Training Authority) (2006) *Sector skills plan for the Local Government SETA*. Pretoria: LGSETA

MDB (Municipal Demarcation Board) (2005–2006) *2005/2006 capacity assessments*. Accessed February 2007–July 2007, www.demarcation.org.za

Ovens (Wendy Ovens and Associates) (2006) An assessment of municipal development planning capacity. Report to the KwaZulu-Natal Provincial Planning and Development Commission

Parnell S, Kitchin F, Ovens W & Williamson A (2007) Land management and democratic governance in five South African major urban centres. Report to Urban Land Mark

Robinson P, McCarthy J & Forster C (eds) (2004) *Urban reconstruction in a developing world*. Sandown: Heinemann

SACPLAN (South African Council for Planners) (2008) Draft Status Quo Report on Registration

SAQA (South African Qualifications Authority) (2007) *Trends in public sector higher education in South Africa, 1995–2004*. Pretoria: SAQA

Sim V, Oelofse C & Todes A (2004) eThekwini municipality: Assessment of the municipality's environmental and planning processes. Report to the Ethekwini Municipality

South African Government Information (2006) *Accelerated and Shared Growth Initiative for South Africa (Asgisa)*. Accessed 18 April 2006, http://www.info.gov.za/Asgisa,

Stats SA (Statistics South Africa) (2005) *South African Standard Classification of Occupations (SASCO)*. Pretoria: Stats SA

Todes A & Harrison P (2004) Education after apartheid: Planning and planning students in transition. *International Development Planning Review* 26(2): 187–208

Todes A, Harrison P & Watson V (2003) The changing nature of the job market for planners: Implications for planning education. *Town and Regional Planning* 46: 21–32

Todes A, Kihato M, Berrisford S, Low Choy D, Hoosen F & Mngadi N (2007) *The relationship between environment and planning in KwaZulu-Natal: Phase 2*. KwaZulu-Natal Provincial Planning and Development Commission

Todes A & Mngadi N (2007) City planners. Report for the Human Science Research Council Study on Scarce Skills for the Department of Labour, August 2007

Watson V (2006) Position paper on the role of the town and regional planning system in the growth and development of South Africa. Report to the Jipsa Technical Working Group

Interviews

Adams Ashraf, Chair South African Planning Institute, and partner, MCA Planners, Cape Town, 8 May 2007

Brooks Frikkie, General Manager: Development Planning, KwaZulu-Natal Department of Local Government and Traditional Affairs, 3 May 2007

Coetzee Maria, Research Group Leader: Integrated Planning and Service Delivery, Built Environment, Council for Scientific and Industrial Research, 25 May 2007

Dacomb Peter, Director: The Practice Group, and member of the South African Council for Planners, 11 June 2007

Davies Janet, Local Government Sector Education Training Authority, 6 June 2007

De Waal Tania, Deputy Director Chief Directorate: Environmental and Land Planning, Western Cape Provincial Department of Development Planning and Environment, 14 June 2007

Harrison Philip, Executive Director: Development Planning and Urban Management, City of Johannesburg, 23 April 2007

Iyer Nathan, partner, Iyer Rathaug, 8 June 2007

Lincoln Gill, Head of the Department of Town and Regional Planning, Durban University of Technology, and member of the South African Council for Planners, 14 May 2007

Mammon Nisa, private planning practitioner, Cape Town, 12 April 2007

Mboweni Amos, Deputy Director: Human Settlement Development, Western Cape Provincial Department of Local Government and Housing, 30 April 2007

Moonsammy Soobs & Benjamin Gavin, respectively Acting Head: Sustainable Development and Head: Development and Planning, eThekwini Municipality; Deputy Head: Strategy and Policy, Development and Planning, eThekwini Municipality, 22 May 2007

Oranje Mark, Professor of Town and Regional Planning, University of Pretoria, 6 June 2007

Ovens Wendy, Wendy Ovens and Associates, 3 May 2007

Ngobeni James, Chair South African Council for Planners, and Head of Matingi and Associates, 24 May 2007

Southworth Barbara, Director: City Spatial Development, City of Cape Town, 16 May 2007

Contributors

Designations are as at the time of writing

Dr Mignonne Breier
Chief research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Dr Rènette du Toit
Research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Dr Johan Erasmus
Research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Shane Godfrey
Senior researcher
Labour & Enterprise Policy Research Group
Institute of Development & Labour Law & the Sociology Department,
University of Cape Town

Nicci Earle-Malleson
Research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Loyiso Mbabane
Director: School of Business & Enterprise
Faculty of Management & Commerce
University of Fort Hare

Prof Thobeka Mda
Deputy executive director
Policy Analysis & Capacity Enhancement
Human Sciences Research Council

Thando Mgqolozana
Researcher
Education, Sciences & Skills Development
Human Sciences Research Council

Dr Jeffy Mukora
Research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Andrew Paterson
Researcher
Education, Sciences & Skills Development
Human Sciences Research Council

Joan Roodt
Research specialist
Education, Sciences & Skills Development
Human Sciences Research Council

Prof Alison Todes
Professor of Urban & Regional Planning
University of the Witwatersrand

Angelique Wildschut
Researcher
Education, Sciences & Skills Development
Human Sciences Research Council