
AN OVERVIEW OF
South African
human
resources
development

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Compiled by the Research Programme on Human Resources Development,
Human Sciences Research Council

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

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First published 2004

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ISBN 0 7969 2042 7

Cover by Jenny Young
Production by comPress

Distributed in Africa by Blue Weaver Marketing and Distribution,
PO Box 30370, Tokai, Cape Town, 1966, South Africa.
Tel: +27 +21-701-4477
Fax: +27 +21-701-7302
email: booksales@hsrc.ac.za

Distributed worldwide, except Africa, by Independent Publishers Group,
814 North Franklin Street, Chicago, IL 60610, USA.
www.ipgbook.com
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All other inquiries, Tel: +1 +312-337-0747
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Acknowledgements

This book provides an overview of human resources development (HRD) in South Africa based on the 28 chapters in the Human Sciences Research Council's *HRD Review 2003: Education, Employment and Skills in South Africa* (HSRC, 2003).

The Department of Science and Technology

At the outset I wish to pay tribute to the Department of Science and Technology whose generous ring-fenced grant for the period 2001–2003 has enabled us to undertake this ambitious project on HRD.

Authors

I would also like to thank each of the authors who contributed their research and analysis to the *HRD Overview 2003* – colleagues from within and outside the HSRC: Salim Akoojee, Miriam Altman, Fabian Arends, Azeem Badroodien, Tracy Bailey, Haroon Bhorat, Nelius Boshoff, Angus Bowmaker-Falconer, Debbie Budlender, Luis Crouch, Reza Daniels, Richard Devey, Jacques du Toit, Johan Erasmus, Glen Fisher, Elsje Hall, Graham Hall, Frank Horwitz, Ros Jaff, Philip Kneebone, Charlton Koen, Andre Kraak, Deborah Lee, Marina Mayer, Anna McCord, Percy Moleke, Johann Mouton, Andrew Paterson, Helen Perry, Pundy Pillay, Lesley Powell, Joan Roodt, Caroline Skinner, Grové Steyn, George Subotzky, Imraan Valodia, Jocelyn Vass, David Walwyn, Russell Wildeman, Ingrid Woolard.

Reviewers

The following senior academics and government officials are thanked for volunteering to peer review this publication in a very short space of time:

- David Ashton, Professor of Sociology and Director of the Centre for Labour Market Studies, Leicester University;
- Adrienne Bird, Deputy Director-General, Department of Labour;

- Trevor Coombe, formerly Deputy Director-General, Department of Education, Pretoria, and currently an education consultant;
- Hugh Lauder, Professor of Education, Bath University;
- Ian Macun, Director, Skills Development Planning Unit, Department of Labour;
- Simon McGrath, Director of FET Research, Research Programme on Human Resources Development, Human Sciences Research Council;
- Enver Motala, formerly Deputy Director-General, Department of Education, Gauteng Province, and currently an education consultant;
- Joe Muller, Professor of Education, University of Cape Town;
- Helen Perry, independent contractor specialising in education management information systems (EMIS) and education planning;
- Eddie Webster, Professor of Industrial Sociology, University of the Witwatersrand; and
- Michael Young, Professor of Education, Institute of Education, University of London.

I also want to acknowledge Helene Perold, my co-editor on the *HRD Review 2003*, who assisted me greatly in conceptualising this overview.

Introduction

This book provides an overview of human resources development (HRD) in South Africa based on the 28 chapters in the Human Sciences Research Council's *HRD Review 2003: Education, Employment and Skills in South Africa* (HSRC 2003). The text focuses on three institutional subsystems of the larger South African social system, which play an important role in the development of human resources. They are:

- The youth labour market.
- The world of work with its associated enterprise training system.
- The national system of science and innovation.

The book begins with a theoretical explanation of why institutions and joined-up policy co-ordination and implementation are so important in an examination of human resources development (HRD).

The discussion then shifts to the South African context, where it is shown that contradiction and incoherence characterise the operations of these three institutional subsystems. It is argued that joined-up policy co-ordination and implementation need to be intensified, in order to bring about more effective dovetailing and interlocking of the interdependent institutions that comprise these subsystems.

The analysis then presents a critique of the 'high-skills' argument that in the international literature is considered an adjunct and necessary condition (alongside social market institutions and 'joined-up' policy) for the successful expansion of HRD. For a developing country such as South Africa, with a large proportion of its populace unemployed and possessing very low levels of skill, a privileging of high skills is inappropriate as the single focus of HRD. The book argues the case for a multi-pronged HRD approach, comprising a joint high-skill and intermediate-skill strategy on the supply side, underpinned by a demand-driven strategy which seeks to stimulate large-scale labour-absorbing employment growth supported by appropriate inputs of low-level skills training.

The analysis then examines the actual skills deficit in South Africa in each of the three (high-, intermediate- and low-) skill bands, drawing on evidence

from Chapters 1–28 in the *HRD Review 2003*. The analysis concludes by arguing that the skills problem is not located only at the high-skill end, but also in terms of intermediate and low-skill needs. Each of these skill bands are experiencing severe HRD problems which need resolution.

1 Conceptual framework

A conceptual framework is developed in this chapter which views HRD as entailing several stages in the life cycle of human development. Four important stages can be identified:

- The transition to school.
- The transition from school and first-time entry into the labour market.
- Traversing the labour market throughout working life.
- Exiting the labour market.

Each stage occurs within a specific institutional setting: the social institutions of early childhood development (ECD), the youth labour market, the world of work, and lastly, the social institution of retirement. Much of the empirical description contained in this study focuses on the second and third phases mentioned above in the human life cycle – the transition from school and traversing the labour market throughout working life. No research work was specifically commissioned on early childhood development or the withdrawal of skill from the economy through retirement.

However, there is another institutional setting that receives significant coverage in the study, which has more to do with the development of a national economy than with the life cycle of an individual. This refers to the national system of science and innovation, within which the all-important process of the economy moving up the value chain takes place. The institutions in this key subsystem and the nature of their interactions largely determine the extent to which South Africa is able to move up the value chain.

The three institutional subsystems, the youth labour market, the world of work and the national system of science and innovation, were chosen to create a conceptual lens through which the vast and bewildering array of HRD developments and processes described in this book can be adequately grasped and interpreted.

Sociologically speaking, these subsystems are structural (social systems comprised of specific institutions, state policies and particular social groupings) as well as individual phenomena (sites in which individuals acquire significant personal development). The way in which these three subsystems are socially

organised impacts powerfully on the diffusion of educational opportunities and skills development at both a societal (structural) and individual level. For example, if these institutional subsystems are shaped by a high degree of social stratification, based on race, gender and class, these characteristics will limit the effectiveness of policies that seek to promote human resources development across a wide social base. The subsystems act as a filter through which key societal processes (such as the implementation of government education, employment and innovation policies) are mediated, altered and affected. Table 1 highlights the plurality of institutions that inhabit these three subsystems.

It is evident from Table 1 that each of these subsystems comprises multiple institutions across several domains such as education, the labour market, industry, and society itself. As a consequence, problems that are intrinsic to

Table 1 Institutions critical to the development of human resources

Key institutions within the youth labour market	Key institutions within the world of work	Key institutions within the national system of science and innovation
Public and private primary and secondary schools	Those public and private further education and training colleges that offer continuing education and training for adults in the workplace	Institutions of science such as universities, technikons, science councils and government-funded R&D laboratories
Public and private further education and training colleges	Those public and private universities and technikons that offer continuing education and training for adults in the workplace	Society's science under-structure – the telecommunications and transport infrastructure
Public and private universities and technikons	Partnerships between industry and higher education, focused on learning and innovation	The continuum of firms that form the basis of a highly segmented economy, with high-technology, high value-adding firms on the one end, and low-tech, low value-adding firms on the other end
Public and private sector training centres for the pre-employed	The 25 sector education and training authorities (SETAs) and their associated training programmes for employed and unemployed adult workers	Enterprise-based R&D laboratories



Firms in the formal economy that employ young school-leavers	Firms with internal training practices (termed internal labour markets)	Practices of technology transfer, both as encouraged by the state, and practiced by private enterprises, through the application and diffusion of new technology
Small, medium and micro enterprises (SMMEs) in the informal economy that employ young school-leavers	External providers of training to firms that do not undertake in-house training themselves	Enterprises organised by flattened hierarchies and co-operative forms of work organisation
Employer associations and networks that help shape policy on training	Firms that do not provide training, but poach skilled labour from other firms	Enterprises organised by hierarchical and fragmented forms of work organisation
State and NGO-run employment advice bureaux	The employer associations and networks representing firms dependent on low, intermediate and highly-skilled labour	Historically acquired institutional cultures that promote or retard enterprise training
Trade unions with a concern for youth employment	Trade unions with a concern for training of the employed and unemployed	
Communities of the unemployed	Communities of the unemployed	
Communities of those unable to work because of disability or ill-health	Communities of those unable to work because of disability or ill-health	

Source: Compiled by the author

these subsystems, such as a mismatch between the outflows from schooling and employment opportunities in the youth labour market, are rarely reducible to one institution or the policies of one government department. Rather, they impact on the collective ensemble of institutions in the subsystem, and relate to a cross-sectoral basket of government policies.

In developing this approach, the chapter borrows strongly from ‘institutional sociology’¹ to argue that institutions play a central role in the development of human resources. This is because institutions, through synergistic interaction with each other, produce certain ‘collective’ goods such as multi-functional skills, enterprise research and development (R&D), networking, industrial clus-

tering, and co-operative industrial relations, all of which are central elements of competitiveness in the new global economy. The development of human resources needed to meet the skills needs of the economy depends on a number of important processes, including co-operation between the state and employer associations. The environments in which these processes take place are made up of interdependent institutions that, by dovetailing with each other, are more likely to achieve these synergistic collective outcomes and effects.

These collective goods do not arise easily under pure market conditions. This, taking enterprise training as an example, is because of the 'standard externality problem', whereby individual employers, faced with training decisions based purely on 'free market' principles, most often fail to provide sufficient training for society's needs. When employers do train, they tend to train in narrow company-specific skills. Those employers who don't train, poach.

However, market failure becomes a more severe problem when considered against the complexity of changes required in the shift up the value chain towards higher value-added production, which is the central pillar of competitiveness in the new global economy. Private enterprises and the market mechanism are not well placed to initiate this vast array of changes, precisely because the benefits to society are far greater than those accruing to individual employers. Dynamic growth depends on investments in infrastructure being made on a scale far beyond the means of any single employer. What is required is large-scale investment in education and training institutions, R&D facilities, employer associations, innovation partnerships between higher education institutions and industry, and industrial peace. These investments are best attained through co-operation between the state, employers and civil society. Such co-operation is usually expressed organisationally, by social institutions interacting and working together to attain certain commonly agreed social outcomes.

Within these subsystems, institutions have a tendency to interlock and cohere, entrenching particular outcomes and ways of functioning over the medium to long term. However, if these outcomes clash with new government policy goals, or alternatively, if these institutional subsystems become unstable (contradiction and incoherence may be intrinsic within them, in which case they will be unable to attain coherence and synergy), it is inevitable that state policy goals will rarely impact as originally intended. The institutional subsystem becomes dysfunctional and fragile, a context ultimately requiring

fundamental institutional change and transformation if larger social changes are to be achieved.

Evidence provided later in this book suggests that the three subsystems in the South African context – the youth labour market, the world of work and the national system of science and innovation – display a high degree of dysfunction and disequilibrium. Key institutions in each subsystem are not aligned with the dynamics and needs of other institutions, creating an environment of contradiction and disconnection. In part, the difficulties in each of these subsystems are historically and culturally derived, but they also reflect the stresses and strains of new institutional and policy arrangements initiated since April 1994. In some cases, the resultant policy outcomes are not as originally envisaged.

The data and the analyses presented in this study suggest that complex HRD problems arising in each of these three institutional subsystems are intrinsically cross-sectoral. Because they originate from a multiple set of interdependent institutions operating out of alignment with each other, such problems are very rarely reducible to single government department portfolios; nor can they be resolved through mono-departmental government action. They require cross-sectoral interventions. However, government departments and policies often act in mono-functional mode, unable and, in some cases, unwilling, to acknowledge and act on the interdependencies that exist between the HRD problem, and other institutions, policies and government departments.

Solutions to institutional incoherence: 'joined-up' policy

Chang (1994, 1998) argues that one of the reasons that institutional subsystems become incoherent and fail to interlock is because of the absence of reliable and up-to-date information upon which governments can act. Without appropriate information, it is difficult to co-ordinate these vast subsystems across multiple social sectors. Chang argues that the problem of co-ordination in complex capitalist societies arises from a lack of communication between transacting economic agents, the one not aware of the concurrent decisions and plans of the other. Resolving this co-ordination dilemma will induce costs that may be high in the context of multiple economic agents.

According to Chang, the solutions to the co-ordination dilemma under advanced capitalism lie with the state, and with various collective institutional

arrangements that act to reduce transaction costs and resolve the co-ordination problem. Chang (1994) lists several benefits that stem from state co-ordination of the economy, and looks primarily at industrial policy as a key lever of state intervention, which can act to resolve problems of co-ordination. Key strategies include:

- **Targeting winners:** The need for strategic targeting arises from the massive shifts in global trade over the past two decades. This has necessitated the adoption of a 'targeted' approach to economic planning, for example, a focus on which manufacturing products can best capture comparative advantage in the global economy. Sectoral targeting policies are, therefore, aimed at developing particular niche industries to 'achieve outcomes that are perceived by the state to be efficient for the economy as a whole' (Chang 1998: 60).
- **Promoting technological change and R&D:** Another key function of the co-ordinating state is to enhance technological capacity. Private enterprise alone cannot build up indigenous technological capacity. The enabling state is a necessary pre-condition for the growth of indigenous technological capacity (Kaplinsky 1990: 24), because it is very costly and can only be developed, adapted and diffused in the long term. This requires capacities way beyond the means of individual enterprises. The need for an active state pursuing indigenous technological capacity has become more acute since the late 1970s, with the advent of a whole new generation of technologies including information technology, biotechnology and new materials technology. Those countries not pursuing active technology policies are likely to fall further behind in the race for international competitiveness.
- **Visioning:** The state is able to perform other economic co-ordinating roles in addition to the broad ambit of industrial policy measures raised above. These include the task of providing a broad vision of the future of the economy to generate 'a voluntary co-ordination of activities which could be achieved through private agents' (Chang 1998: 54). Chang argues that a focal point around which decisions can be co-ordinated may lower transaction costs that would otherwise be high, if investments in complementary projects were agreed upon through private bargaining alone (Chang 1994: 53). Good examples of these visioning documents are the Japanese and French indicative planning exercises, and the substantive policy visions produced by Singapore ('Vision 2020' and the 'Next Lap') to map out its next development phase (Ashton & Green 1996: 167, 169).

Brown, Green and Lauder (2001) argue that because of the complexity of contemporary economic life, particularly in its thick institutional settings, co-ordination needs to be more systematic. It requires detailed foresight planning and the co-ordination of national and regional economic development, through networks of local stakeholders, national strategies, research institutes, technopoles, and global companies (Brown et al. 2001: 44). The role of government, they argue, 'is not to direct, but to inform, facilitate and co-ordinate' (2001: 45).

'Joining-up' is essentially an argument about the necessity for educational reforms to interlock with macroeconomic, industrial and labour market reforms, so that their combined impact brings about a greater dovetailing and interlocking of institutions. In so doing, the intention is to trigger more synergistic and complementary policy outcomes across divergent institutions than was previously possible.

Relevance to South Africa

Sceptics may wonder whether the approach outlined above is relevant to South African conditions. The answer is that joined-up policy and institutional regulation are relevant and are, indeed, already present in many features of South African governance. President Mbeki has taken the lead by establishing the 'cluster' system in his management of the Cabinet. Cognate departments in key areas, such as social and economic policy, are grouped together at the levels of both ministers and directors-general, who are required to plan short to medium-term strategies for achieving Presidential priorities such as job creation, poverty alleviation and human resources development. These plans are interrogated, adapted and finally approved by the President and Cabinet at six-monthly 'lekgotlas', which take place in January and July of each year. In almost all cases, acute social problems are seen as arising cross-sectorally, their reform requiring joined-up government action. The Policy Co-ordination and Advisory Services Unit in the Office of the Presidency helps to administer and co-ordinate all of these activities. More recently, President Mbeki has spoken of strengthening this joined-up approach, with regard to medium-term foresight planning:

Further, to improve on our performance, this year's government budgeting cycle will see the formulation of a Medium Term

Strategic Framework led by the Presidency, with the participation of other departments of government. The Medium Term Strategic Framework encapsulates the key challenges confronting government in the medium term that need to be taken into account in deciding the budget. ... This will further strengthen the co-ordinating role played by the Forum of South African Directors-General (FOSAD), the sector Clusters of Directors-General and the President's Co-ordinating Council (PCC) that brings together the Provincial Premiers and the President. To expedite the realisation of our policy objectives, the DG Clusters have been charged with the preparation of implementation reports, which are then submitted to the appropriate cabinet committees, for subsequent assessment by the Cabinet.

Further, the Presidency has formulated a National Spatial Development Perspective (NSDP) on the basis of a study of the country's social, economic, environment and spatial trends over the past decades. The objective of this perspective is to develop guidelines to ensure that government's infrastructure investment and development spending programmes have better spatial outcomes than are currently being achieved. (Mbeki 2003b)

This Presidential initiative is backed by other forms of cross-sectoral state co-ordination and planning, for example, the Medium Term Expenditure Framework (MTEF), which was adopted by the Treasury in 1997. The MTEF is a powerful planning and foresight tool that enables government agencies to project the costs of existing and future policies over the short to medium term (Wildeman 2003).

Other examples of 'joining-up' are the social market institutions such as the National Economic Development and Labour Council (NEDLAC) and the 25 sector education and training authorities (SETAs) as well as the social compacts signed regularly between government, employers and labour. The most recent social compacts were the Job Summit of 1998 and the Growth and Development Summit of June 2003, the latter primed specifically to tackle job creation, increased investments and skills development.

In addition, government's recently launched microeconomic reform and integrated manufacturing strategies aim at more thorough structural reform than

has occurred in the past. They include cross-sectoral policy levers such as improving economic and social infrastructure, improving access to finance for productive activities, increasing investments in research and development, enhancing innovation and the take-up of new technologies, and improving HRD more generally. This is also related to government's recent expansionary expenditure programme, as outlined in the past two Budgets (to cover greater infrastructural development, increased investments in R&D and higher education, and larger social welfare transfers), which signifies a stronger role for the state in national economic and social life. Lastly, government's focus on strategically located 'nodes' in both highly populated urban and rural settings requires cross-departmental action and integrated planning capabilities.

Key features of HRD in South Africa

Chapter 2 profiles the three institutional subsystems defined earlier, and demonstrates how several HRD problems are expressions of highly contradictory and disconnected interactions between institutions in each of these institutional locales.

However, it is first necessary to outline how key features of these institutional forms have been historically and culturally derived, and how they continue to shape the present context. Space constraints do not permit a detailed account of these historical and cultural factors, but five key determinants can be identified: educational institutions, the labour market, the national economy, historical and cultural influences, and the absence of internal labour market practices. Each of these is briefly discussed.

Educational institutions

A highly stratified social system of provision, put in place by apartheid, reserved the best education institutions for whites and allocated third-rate institutions to blacks, particularly Africans. These institutions were characterised by poor quality curricula, pedagogy and infrastructure. In addition, apartheid geo-political physical planning saw to it that key educational institutions for blacks were located in isolated, rural and poorly resourced neighbourhoods. Since the advent of democracy in 1994, the system has masified considerably, with black students constituting the majority population in most educational institutions. However, those institutions where the

majority of Africans are enrolled are still characterised by poor quality tuition provision and suffer the results of apartheid-driven spatial planning. These structural and institutional features, inherited from apartheid, are highly resilient in the face of change.

The labour market

Apartheid was primarily a socio-economic system designed to provide cheap labour to the mines, factories and farms in the early period of South Africa's industrialisation. Strict job reservation, residential segregation and labour coercion created a highly segmented labour market that provided for the needs of early industrialisation. However, as the apartheid system matured, and faced growing difficulties stemming from a shortage of skilled labour in the late 1960s and early 1970s, the apartheid state undertook several reforms that allowed for more permanent African urban settlement, and the upskilling of the African labour force. These processes, alongside the unionisation of the African semi-skilled and unskilled working class and the politicisation of African school children, led to the intensification of political pressures on the apartheid state to reform even further. However, notwithstanding significant upskilling of the African working class in the formal economy since 1994, and the growth of African enrolment in urban schools, colleges, universities and technikons, the segmented labour market has remained relatively intact, resistant to the changes brought about by the democratic government since 1994.

The national economy

South Africa's economic development during the apartheid era was based on its resource-rich, minerals extraction economy, and more specifically, the implementation of import-substitution policies throughout most of the twentieth century. Although it provided the wealth for a small and privileged white elite, the opportunities for ongoing import substitution were exhausted by the early 1970s, and alongside other economic crises (such as the world oil crisis and internal political unrest), the South African economy began to flounder. Although policies have shifted to encourage a more open and export-oriented industrial sector in the post-1994 period, and although some success has been achieved in the manufacturing and services sectors (particularly automobiles) in this regard, the post-apartheid economy has been

characterised by a key feature of the apartheid minerals complex: its tendency towards ever-increasing capital and skills-intensity. South Africa's economy continues its low-growth, low-employment scenario, with a growing demand for skilled labour and increasing levels of unemployment amongst the unskilled and semi-skilled.

Historical and cultural influences

Apartheid's legacy is not merely structural and institutional; it is also behavioural and attitudinal. These historical and cultural currents manifest themselves in contemporary responses to education and training by the key participants in human resources development. For example, the tradition of weak employer interest in enterprise training continues to shape employer responses to the National Skills Development Strategy (DoL 2001). The persistence of skewed subject choices (the avoidance of science, engineering and technology, and a preference for 'softer' subjects) has had serious ramifications for the allocation of young school-leavers to productive roles in the wider society. In addition, the social stigma attached to school-based technical education and college-based vocational training has meant that low numbers of learners have enrolled in these learning tracks, and that perceptions of poor quality in further education and training have become entrenched. These examples reflect the larger challenge of engaging with behavioural/attitudinal change, to effect wider institutional and structural changes.

Absence of internal labour market practices

Internal labour markets are located within specific enterprises. In such markets, jobs are usually filled by internal promotion, and skills are acquired internally rather than through the acquisition and possession of externally recognised qualifications. In the South African context, however, key features of internal labour markets are absent. This has to do with South Africa's particular path to capitalist development, based historically on cheap black labour recruited within a coerced, rather than a flexibly regulated, labour market environment. Historically, the focus on institutions in the South African labour market has been on labour control, low wages and political repression. South Africa does not have a tradition of labour market institutions func-

tioning to assist the process of traversing the labour market, with the exception of the apprenticeship system for the white working class during the first seven decades of the twentieth century. Although progressive labour relations legislation has been introduced since 1994, and new training institutions have been launched to regulate training (the 25 sector education and training authorities), the culturally inherited practices and attitudes, with regard to enterprise training, remain a massive stumbling block.

The discussion will now shift to a description of the three institutional sub-systems – the youth labour market, the world of work, and the national system of science and innovation. The analysis will show that as a consequence of the dual impact of these historically- and culturally-derived determinants alongside the new demands of post-apartheid policy, key social outcomes arising from these three sub-systems are increasingly characterised by a high degree of incoherence and contradiction.

Notes

- 1 See the French 'regulation' school (Aglietta 1979; Lipietz 1988); the American 'social structures of accumulation' school (Gordon, Weiskopf & Bowles 1983); the 'societal' school (Maurice, Sellier & Silvestre 1986); the 'new institutional sociology' (Crouch & Streeck 1997; Dore 2000; Rodgers et al. 1996; Streeck 1992); the 'new institutional economics' (Chang 1994, 1998); and more recently, the British literature on vocational education and training (Ashton & Green 1996; Brown, Green & Lauder, 2001; Crouch, Finegold & Sako 1999; Finegold & Soskice 1988; Finegold 1991).

2 The youth labour market

The youth labour market is probably the most important phase in any young person's development, particularly the transition from school to work or further/higher education and training. As Table 1 in Chapter 1 showed, several important institutions, which are part of the youth labour market, are associated with this phase of human development. These include institutions of further and higher learning, pre-employment training, and those institutions that provide employment advice and career counseling. Most importantly, it is the institutional nexus within which the transition from school to work or further and higher learning takes place.

The next section will explore the youth labour market in South Africa in three ways. Firstly, it will look at the supply side, more specifically, at the dramatic expansion and transformation of the institutional landscape of South African education and training and the concomitant deracialisation of enrolments over the past three decades.

Secondly, the discussion will examine the downside of such dramatic growth – the emergence of severe throughput inefficiencies in all three bands of the public education and training system.

Thirdly, problems on the demand side will be examined, in particular, the poor employment absorption rate of the youth labour market and the absence of alternatives for young people who do not find work, for example, through pre-employment training, training programmes for the unemployed or through youth access to informal sector activity.

The section concludes by arguing that the youth labour market, as an institutional subsystem, is characterised by severe problems, including most fundamentally, its inability to facilitate the progression of young people from school to other learning or employment activities. There is clearly a mismatch between the outputs of schooling, the options for further and higher education or pre-employment training, and the actual employment opportunities available in the labour market.

Key trends of the supply side

The most dramatic change in South African education over the past three decades has undoubtedly been the growth in both the public and private systems of provision. Table 2 highlights the magnitude of this growth both in terms of size and changing social composition:

Table 2 Total headcount enrolments in the education and training sectors, 1970–2000

	Total headcount in previous years	Total headcount, 2000	Percentage black in 2000	Percentage black in previous years
Public provision				
Public higher education	340 000 (1988)	611 000	72	42.0 (1988)
Public FET colleges	76 435 (1991)	350 465	84	32.3 (1990)
Public schooling	5 379 665 (1975)	11 374 848	92	87.0 (1985) 83.0 (1975)
Private provision				
Private higher education	-	85 657 *	66	-
Private FET colleges	-	706 884**	90	-
Private schooling	103 854 (1990)	382 239	71	49.0 (1990)

Sources: Akoojee 2003; Du Toit 2003; Fisher et al. 2003; Perry & Arends 2003; Subotzky 2003a; Subotzky 2003b

* 85 657 learners were audited in only 86 of the 97 registered private higher institutions.

** These 706 884 learners are students in short course study, not full-time equivalent enrolments.

The numbers in Table 2 are significant for several reasons. Firstly, the massive growth in public schooling is accounted for by the enormous growth in African enrolment since the mid-1970s. In 1975 African school enrolments were 3 688 432. In 1985 they had reached 6 013 050 and by 1994 they were 9 378 425 – a growth of 154 per cent over 20 years (Perry & Arends 2003).

This growth was a consequence of several factors, the most important being: the acceptance of the permanency of black workers in the urban areas of the former 'white' South Africa driven primarily by the need for a more skilled urban workforce in the late 1970s; the demand for more education from black South Africans, particularly after June 1976; and the growth of several ban-tustan school systems during this period.

Disaggregating even further, the growth in secondary schooling has been phenomenal – again largely due to increases in African enrolments. The Gross Enrolment Ratio (GER) for secondary schooling (calculated by dividing the total secondary school enrolment by the population of 14 to 18-year-olds) increased from 21 per cent in 1975 to 58 per cent in 1985 to 90 per cent in 1997 (Perry & Arends 2003).

With regard to matriculation, there were only 8 378 African candidates enrolled for the Senior Certificate Examination (SCE) in 1975. By 1993, this had expanded to 337 821 African candidates (Perry & Arends 2003). The average annual increase between 1975 and 1993 in the number of African candidates writing the SCE was 22.8 per cent.

The South African public schooling system has truly massified. This picture contrasts sharply with the period prior to 16 June 1976, when very low levels of African enrolment were evident and where few facilities existed for African students in the so-called ‘white’ areas of South Africa, particularly in secondary schooling.

Growth in higher education

Similar growth dynamics are evident in public higher education (HE) (see Table 2). African HE enrolments rose fourfold from 97485 (29 per cent of the total) in 1988 to 368 289 (60 per cent of total) in 2000. Conversely, white enrolments dropped from 196 204 (58 per cent) to 165 978 (27 per cent). Overall headcount enrolments grew from 340 000 in 1988 to 611 000 in 2000 – almost doubling in this period.

The transformation in HE has also led to a dramatic change in the social composition of students. For example, in 1988, only 673 Africans were enrolled in Afrikaans institutions (one per cent). By 2002 this reached 94 219 (52 per cent). The ‘Africanisation’ of technikons was even more dramatic, with African enrolments at historically advantaged technikons increasing massively from 818 (two per cent) in 1988 to over 65 000 in 2000 (68 per cent). This was accompanied by a huge drop in white enrolments at technikons – from 43 840 (75 per cent) in 1993 to 21 665 (21 per cent) in 2002 (Subotzky 2003a).

The massive surge in HE enrolments between the late 1980s and the mid-1990s has not yet been fully explained by social analysts, although it is clearly

a response to the dramatic growth in the number of Africans reaching matric by the late 1980s, and consequently, the increased eligibility of candidates for further and higher education. However, another critical factor was the deliberate defiance shown by institutions such as the University of the Western Cape, University of Durban-Westville, and Peninsula Technikon against apartheid's restrictions on the uptake of African students in the late 1980s. Other institutions then copied these actions, particularly the technikons, which opened their doors to large numbers of African students, many whose school grades would not have been previously recognised.

These shifts in the racial composition of enrolment in public higher education institutions are profound. Black students now constitute the majority segment in all institutions of higher learning, including those previously reserved for the children of the English and Afrikaans-speaking white elites.

Growth in FET

Public further education and training (FET) colleges have transformed at a similar pace. In 1991, a total of 76 435 students were enrolled in technical colleges – two-thirds of these were white (Fisher et al. 2003). By 2000, the sector had grown to 350 465 headcounts, and this growth was largely due to increases in African enrolments (75 per cent of the total).

Growth of private provision

The participation of the private sector in education has a long history in South Africa, but in contrast to the scale of public provision, its role has been largely marginal. The imposition of apartheid segregation on educational practices in the 1950s saw some churches and other institutions rebel by providing alternative private schooling outside of the strict control of apartheid Christian National Education. In addition, the new skill requirements which arose out of the growth and modernisation of the South African manufacturing and mining sectors from the mid-1940s through to the late 1960s, gave birth to a private post-secondary technical and vocational education sector (Mabizela 2002). However, both of these post-1945 movements were small in scale and impact.

This was to change in the 1990s. The promise of freedom and civil liberties, particularly the dismantling of apartheid's restrictions on non-racial enrol-

ment, and the opening up of the South African economy to unconstrained global market forces, led to a significant increase in the number of private initiatives in education. Emerging off a low base, the magnitude of the growth does not yet threaten public provision (as was previously feared by public providers). However, the rate of growth since 1990 has been significant.

In a survey undertaken in 2002, the HSRC found there to be a much larger number of learners in independent schooling than previously estimated – comprising 382 239 students in 2002. This is significant growth off a low base of 103 854 in 1990, but it is still small in comparison with the public sector, contributing an equivalent of approximately 3.2 per cent of the total public school enrolment of 11 738 126 in 2000.

Du Toit (2003) shows that 61.1 per cent of all independent schools were set up and registered after 1990, highlighting again the noticeable growth since 1990. The independent schooling sector has also shed its image as a ‘white-flight’ phenomenon with black students now constituting the majority of learners – 70.6 per cent (Du Toit 2003).

Private HE displays less dramatic growth figures in aggregate terms. In a survey of 86 private HE institutions (out of a total number of 97 registered institutions) undertaken in April 2002, total enrolments were 85 657 – 55 428 of whom were registered for programmes certificated by public HE institutions, and only 30 229 in programmes run and certificated independently by private HE institutions (Subotzky 2003b).

These figures show a smaller private higher education sector than originally anticipated, with the majority in public-private partnerships offering mainly diplomas in education via Afrikaans-medium universities. Relatively few enrolments are evident in transnational institutions (only 1 242 students in 2001). The social composition of the private HE sector is significantly deracialised, with black students comprising 62 per cent of South African students in the sector (Subotzky 2003b).

Private FET provision comprises those vocational and career-oriented courses in private colleges and institutions that are at Levels 2 to 4 on the NQF and equivalent to Grades 10 to 12 in the academic stream. This definition deliberately excludes private school-based FET provision (which is covered by the independent school category).

There has been significant growth in the private FET sector since 1990. A recent HSRC survey revealed that 70 per cent of providers were established in the period 1992 to 2001 as compared to 14 per cent established in the decade before (Akoojee 2003). Estimates of the learner headcount in the pre-registration process with the national Department of Education was 706 884 learners for 864 providers (Akoojee 2003). The difficulty with measuring the size of private FET, though, is the absence of full-time equivalent (FTE) measures. Many of these 706 884 learners will be undertaking short-course training part time and cannot therefore be counted as full-time learners involved in whole qualification upgrading.

The enrolment profile of private FET providers corresponds with the demographic profile of the country – with African enrolment at 73 per cent, Indian enrolment at six per cent, coloured enrolment at eleven per cent and white enrolment at ten per cent (Akoojee 2003).

The growth in educational provision described above (both public and private) has been large and has enabled South Africa to achieve one of the highest gross enrolment ratios in Africa. However, this growth surge has leveled off in the past five years and participation rates in FET and HE remain low. As has occurred in other developing countries, this rapid enrolment surge has not been met by an equivalent growth in institutional capacity – a problem made worse in South Africa by the machinations of apartheid social planners – producing a structure which severely limits the successful through-flow of learners in and out of the system. In short, the expansion described above has not constituted a mass education system as is commonly understood in the international literature, nor has it reached the high levels attained in many East Asian countries in the 1980s and which provided the springboard for rapid economic development. The discussion now turns to examine key aspects of this inefficient throughput.

Systemic inefficiencies

The net enrolment ratio

A key measure of throughput efficiency in the schooling system is the net enrolment ratio (NER). The NER only measures those learners who are the appropriate age for the primary or secondary phase. Until 2000, underage

learners and a high number of repeaters bloated Grade 1 enrolment. This is evident in the gross enrolment ratio (GER) that divides the total primary or secondary school enrolment by the population of 7- to 13- or 14- to 18-year-olds. In 1997, the GER for Grade 1 was 166 per cent. The extent to which this had normalised by 2000 (because of government's efficiency-driven intervention to enroll only children who turned seven in the first grade) is reflected in the revised GER for Grade 1 of 115 per cent (Perry & Arends 2003).

Table 3 shows the NER for all provinces in 1997. Ninety-two per cent of the appropriate age group were enrolled in primary schools. Only 57 per cent of the population aged 14 to 18 were in secondary schools. This means that 43 per cent of the 14- to 18-year-old population were either not attending school or were repeating higher primary grades.

Table 3 Net enrolment ratio in the ordinary public and independent school sector by province in 1997

Province	Primary school percentage	Secondary school percentage	Total percentage
Eastern Cape	97	45	77
Free State	91	59	78
Gauteng	86	59	75
KwaZulu-Natal	105	63	88
Mpumalanga	95	57	79
Northern Cape	78	47	65
Limpopo	87	65	79
North West	74	45	62
Western Cape	88	58	75
Total	92	57	78

Source: Perry & Arends 2003

Repetition and dropout

A further indicator of systemic inefficiency is the extent of repeaters and dropouts. According to Perry and Arends (2003), the average percentage of learners dropping out of school in each of the primary grades is three per cent. Given the high level of enrolment of 7- to 13-year-olds discussed in the

section above, it is likely that most of the learners dropping out in the primary phase would be over-age learners, although other factors such as poverty clearly play a role. The dropout rate in the secondary grades climbs steadily to 14.1 per cent in Grade 11. In aggregate terms, approximately nine per cent of secondary learners each year eventually drop out of secondary schooling before completing Grade 12 (Perry & Arends 2003).

Reduction in school population

A third systemic weakness is reflected in the reduction of the total school population between 1997 and 2000 and the leveling off of Grade 12 enrolments. Table 4 provides the relevant data:

Table 4 Reduction of the total school population, 1997 and 2000

Phase	1997	2000	Total growth percentage	Average annual growth percentage
Primary	8 088 979	7 399 913	-8.5	-2.9
Secondary	3 933 341	3 974 935	1.1	0.4
Total	12 022 320	11 374 848	-5.4	-1.8

Source: Perry & Arends 2003

The greatest contributor to reduction is in the primary phase and in particular, the drop in Grade 1 enrolments as a result of government's Age Requirements Policy (Perry & Arends 2003). However, provinces have experienced reductions in the number of Grade 12 students as well. Of greater concern, student numbers have shrunk in each grade in the primary phase in KwaZulu-Natal during 1997 and 2000 (by -15 per cent), and in both the primary (-13.69 per cent) and secondary (-8.9 per cent) phases in the Eastern Cape (Perry & Arends 2003). Causes of such high drop-out rates in these two provinces are as yet unknown, but it may be as a consequence of poverty, the application of the policy to prevent serial repetition, HIV/AIDS and a general feeling of despondency as to the relevance of education in conditions of high unemployment.

The case with Grade 12 reduction is similar. After the rapid growth in schooling enrolments and SCE candidates as described earlier, the number of SCE candidates reached a plateau in the mid-1990s and by the late 1990s had started to

decline. Table 5 shows the number of candidates enrolled nationally since 1996. The average annual decrease in the number of candidates since the peak enrolment in 1997 has been 5.2 per cent, with the greatest decrease (8.3 per cent) occurring between 2000 and 2001. There have been a number of reasons suggested for the decrease, including AIDS-related deaths and an aggressive policy by government of excluding repeaters. Perry and Arends suggest that it has more to do with the dropping out of academically weaker candidates in the grades prior to the SCE. Whether this is due to disillusionment, administrative action with regard to serial repetition, or the labour market is impossible to assume without further research (Perry & Arends 2003).

Table 5 also shows the number of candidates passing overall and passing with exemption (a minimum level of performance required for entry into higher education set by agreement with the Joint Matriculation Board of the South African Universities Vice Chancellors Association). After 1997 the pass rate increased steadily. This corroborates Perry and Arends' suggestion that the weaker candidates are dropping out of the system prior to writing the SCE. The number of candidates passing the SCE with exemption also reached a plateau in the mid-1990s that has significant implications for plans to expand higher education enrolments.

Table 5 Number of full-time candidates enrolled for and passing the SCE from 1996–2001

Year	Number of candidates	Percentage increase or decrease over previous year	Candidates passing	Percentage increase or decrease over previous year	Percentage pass rate	Candidates passing with exemption	Percentage increase or decrease over previous year
1996	518 032		278 958		53.8	79 768	
1997	556 246	7.4	261 400	-6.3	47.0	69 007	-13.5
1998	554 187	-0.4	273 118	4.5	49.3	69 891	1.3
1999	511 474	-7.7	249 831	-8.5	48.8	63 715	-8.8
2000	489 941	-4.2	283 294	13.4	57.8	68 626	7.7
2001	449 371	-8.3	277 206	-2.1	61.7	67 707	-1.3

Source: Perry & Arends 2003

Inefficiencies in the public HE system

The combined impact of: (i) the leveling-off of SCE candidates, (ii) those with exemption pass rates and (iii) candidates with higher-grade subjects have affected higher education enrolment negatively. Overall headcount enrolments reached a peak of 608 000 in 1998 with a subsequent leveling-off of enrolments at this level between 1998 and 2000. Total enrolments in 2000 reached 611 000 – an increase of only 3 000 students on 1998 figures.

Participation rates in HE have also not increased dramatically as hoped for by the National Commission on Higher Education in 1996. The mean participation rate for all population groups decreased from 17 per cent to 16 per cent between 1993 and 2000 (Cloete, Fehnel, Gibbon, Maassen, Moja & Perold 2002). Participation rates for Africans increased from nine to 13 per cent and for whites decreased from 70 to 47 per cent in the same period (Cloete et al. 2002). Graduation rates (calculated by dividing the total enrolment of students by the number who graduate each year) are also extremely low. Between 1988 and 2000 graduation rates for universities and technikons combined have remained fairly steady at around 15 per cent of each cohort with the technikon rate dropping from an initial 15 per cent in 1988 to ten per cent in 1996 (Subotzky 2003a). These poor throughput statistics are yet another indication of the weaknesses of school education which should provide a more adequate preparation for entry and success in further and higher learning. Other contributing factors include student defaulting on the payment of annual fees and the subsequent exclusion of these students, as well as poverty and HIV/AIDS.

Low levels of science, engineering and technology enrolments in HE

There are other inefficiencies in the HE system. For example, the government's *National Plan for Higher Education* states clearly that the percentage enrolment of science, engineering and technology, business/commerce and humanities/social science students of 26:24:50 in 2000 should be shifted to 30:30:40 over a five to ten-year period in order to meet labour market needs more effectively.

The combined university/technikon ratio of 26:24:50 in 2000 masks further problems, with significant differences between the university (21:20:58) and

technikon (35:31:34) ratios. In particular, the current university ratio of 21:20:58 is problematic, signifying the on-going predominance of the humanities and social sciences in the university sector (Subotzky 2003a).

Skewed graduate outputs by field and level of study

Of the 88 249 graduates from the HE system in 2000, 76 per cent were from universities and 24 per cent from technikons. Of these, 22 852 (26 per cent) were at post-graduate level with only 213 post-graduates qualifying from the technikon sector. The ratio of post-graduate to under-graduate study varied widely between universities and technikons: 34:66 per cent in the former and 1:99 per cent in the latter. Two-thirds of all technikon graduates were at diploma level. A total of 820 doctorates and 5 768 masters degrees were awarded in 2000, almost all at universities (Subotzky 2003a). This indicates that proportionally fewer graduates with higher qualifications, especially at post-graduate level, are being produced by technikons. Although historically the role of technikons has been the training of technically skilled middle personnel (a mission which did not include post-graduate training or basic research) problems arise in the current period as technikons try to emulate universities with the offering of bachelors and masters degrees. However, the data above suggests that the gap in the contributions of universities and technikons with regard to post-graduate training and research still remains large.

Inefficiency in the FET college system

One of the most perverse inefficiencies in the entire education system occurs in the public FET college system. Many of the students attending these colleges have already acquired Grade 12 and are required or volunteer to repeat courses equivalent to Grade 10 to Grade 12 in the form of vocational certificates N1 to N3. Students volunteer to do this in the hope of improving their employment chances in the labour market. This trend was confirmed by an HSRC analysis of 3 503 respondents to a 2001 survey of FET college graduates. In the study, 81 per cent of students entered the college sector with a Grade 12 certificate and subsequently exited with a N3 certificate (an equivalent and not higher level qualification). In short, this constitutes a regression to a level of learning lower than their highest level of achievement (Cosser 2003).

The study also showed that employment prospects remained very low, even after attaining additional vocational qualifications to supplement already achieved school matriculation. Only 33.6 per cent of FET college students found employment after graduation, with 69.7 per cent of African graduates unemployed but only 24.2 of white graduates unemployed. This gross differential between black and white FET college graduates' employment rates would be strongly influenced by the physical location and lack of industrial experience available at many black FET colleges, far from centres of employment and the in-built tendencies of employers' recruitment practices and college/ employer networks that would be more advantageous to white graduates.¹

More significantly, 35 per cent of graduates were continuing with their studies at the time of the HSRC survey – 70 per cent of whom continued with technical college studies (Cosser 2003). It is unclear, however, whether improved college qualifications will lead to better chances of employment or whether this high level of continuing education is merely a strategy to avoid the inevitability of unemployment.

Government education policy is attempting to deal with this wide array of systemic inefficiencies inherited from apartheid. In particular, its new Grade 1 age requirement regulation, the recently announced university and technikon mergers, the already implemented FET college mergers, its school-funding norms and the new funding regimes in HE and FET, its teacher upgrading and science and mathematics improvement programmes, amongst others, all seek to steer education and training institutions towards greater systemic efficiency and the creation of more responsive institutions. Sufficient time has not yet passed to ascertain whether these measures are successful and effective.

Key trends of the demand side

Poor employment absorption rates

The next section examines problems on the demand side, and in particular the failure of the economy to fully absorb the annual outflow of young people from the schooling system. It does this by examining unemployment patterns by education and age. The evidence suggests a high probability of unemployment facing South Africa's youth. In addition, they face poor chances of pre-employment training or employment uptake in the informal sector.

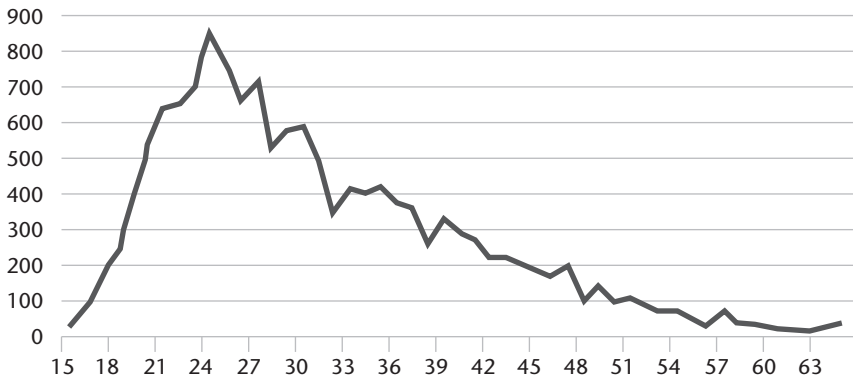
To unpack the central characteristics of this rising unemployment trend, it is first necessary to look at the changing conditions of employment over the past decade.

In real terms 1.1 million jobs were created in the South African economy between 1995 and 1999, while 3.1 million individuals entered the job market, which indicates a shortfall of two million jobs, a situation that may be characterised as one of poor employment growth (McCord & Bhorat 2003).

Unemployment by age

Bhorat and Leibbrandt (2002) show that unemployment rates are significantly correlated with age, as is illustrated in Figure 1. The data on youth unemployment is derived from the October Household Survey of 1999 and relates only to out-of-school youth and post-school adults.

Figure 1 Number of unemployed by age (thousands)



Source: McCord & Bhorat 2003

Individuals of 30 years or younger constitute 56 per cent of the total unemployed, and the 15 to 24 category comprise 30 per cent of the total unemployed, confirming the strong youth dimension to unemployment. The unemployment rate ranges between 50 to 63 per cent for the 15- to 24-age cohort, with the highest rate, 63 per cent being recorded for 17-year-olds (McCord & Bhorat 2003).

Unemployment by race

McCord and Borhat (2003) show that employment increased for all races between 1995 and 1999, with coloured employment growing by 16 per cent, followed by Indian (13 per cent), African (twelve per cent) and finally white employment growth (eight per cent). However, the increase in the economically active population during this period was racially skewed, and was significantly greater for Africans, at 27 per cent, than for other racial groups. When this is taken into account, a racial differential in terms of the labour market's ability to absorb new entrants is revealed, with only 29 per cent of new African labour market entrants between 1995 and 1999 being able to find work, compared to 50 per cent of Indians, 70 per cent of coloureds, and 75 per cent of whites (McCord & Borhat 2003). The consequences of these two growth rates being out of step – that is, the growth rate in the economically active population outstripping the growth rate in employment – are severe. It results in a racially segmented labour market where African new entrants have the lowest chance of finding employment.

Unemployment by education

McCord and Borhat also show the percentage of new labour market entrants at each education level who found employment between 1995 and 1999 (the difference between the growth in new employment and the growth in the EAP by education level). On this basis 40 per cent of new entrants with primary school education found work, 27 per cent of those with uncompleted secondary education found work, and 36 per cent of those with matric found work between 1995 and 1999 (McCord & Borhat 2003).

One of the options available to young school-leavers who cannot proceed to further and higher learning, and who have no work experience and cannot find a job, is to enrol for pre-employment training. However, these opportunities are very limited in South Africa at present. For example, the apprenticeship system, the archetypal form of structured training for young school-leavers in other countries such as Germany, has been in severe decline in South Africa since the mid-1980s. Apprenticeship numbers declined from 29 826 in 1986 to 16 577 in 1998 – a 44.4 per cent decrease in indenturing (Kraak, Paterson, Visser & Tustin 2000).

Government has introduced a new form of apprenticeship, called learnerships, which aims to turn around the decline in structured training particularly for first-time entrants into the labour market. Between April 2001 and June 2002, 14 948 learnership agreements were registered, 10 277 of whom were people already employed and 4 682 who were new entrants into the labour market (DoL 2002c: 14). By March 2003, the number of learnerships registered had reached 23 517, with 8 159 of these learners previously unemployed. Add to these numbers the 10 872 apprentices who were indentured in 2002, the total number reaches 34 389 structured learners in training – a 107 per cent turn-around on the very low figure of 16 577 new apprentices indentured in 1998. The recent Growth and Development Summit held in June 2003 saw government, employers and labour commit to increasing these numbers to 72 000 learners registered by May 2004. While the rate of increase in learnership registrations since April 2001 is impressive, the aggregate numbers are still low in comparison with the size of the youth labour market problem.

Decline of training for the unemployed

The training of unemployed persons and work seekers presents a picture of decline similar to that of apprenticeship. Unemployed young school-leavers must compete for places in these training programmes with much more experienced and older workers who have a better chance of success in getting a job after training. Between 1986 and 1998, the numbers of unemployed workers trained dropped from a combined total of 417 570 to that of 75 058 (Kraak et al. 2000). In addition, job placement success rates ranged from four to 14 per cent. Given the recessionary conditions in the 1990s, the consequent reduction in terms of numbers trained, the lack of jobs and poor placement rates and the fraudulent behaviour on the part of some subcontractors, the programme clearly proved ineffective (Kraak et al. 2000).

Government in recent years has dramatically restructured the programme, shifting its focus from passive to active labour market interventions. Training officials in the provincial offices of the Department of Labour are now required to assess the skill needs and employment growth trends in their regions annually, through scientific research techniques and active employer networking (DoL 1999: 15). The skill needs analysis must then be turned into an annual provincial placement plan specifying the target sectors, occupations and skill requirements that will be focused on during that year. The numbers

of unemployed persons trained under this new approach has increased gradually, from the low of 66 475 in 1997 (under the old system) to improved levels in 1998 and 1999 of 75 058 and 81 752 workers respectively (DoL 1999: 16). Seventy-two per cent of these learners are between the ages of 19 and 35 years old (DoL 1999: 17).

Another leg of government policy with regard to the training of the unemployed that is beginning to kick in is schemes funded by the National Skills Fund (NSF). In the year 2001/02, 71 056 persons completed training courses under this scheme. A very encouraging development in the 2002/03 financial year saw 18 SETA-driven project proposals approved for funding by the National Skills Fund to a total value of R1 billion which aim to benefit nearly 400 000 people over the next three years (DoL 2002e). Of course, not all of these beneficiaries are young first-time trainees who have just left school. They are recruited from the total population of unemployed people. Nonetheless, if such initiatives can be dramatically expanded by the NSF and SETAs, and if placement rates are improved (a placement rate of 22.4 per cent was reported in 1999 (DoL 1999: 16)), some indent may be achieved in reducing the number of young school-leavers entering unemployment and poverty.

Youth access to SMME activity

It is often argued that the small, medium and micro enterprise (SMME) sector is an important vehicle for resolving South Africa's long-term employment and poverty problems, even for the young and unemployed. However, this claim is overly optimistic. In the formal component of the SMME sector, micro and small enterprises are rarely started up successfully by the young or the unemployed. This is illustrated by a World Bank study of 2000, which observed four trends among SMMEs in the Greater Johannesburg area, namely that:

- About 70 per cent of surveyed SMME owners had had previous formal sector work experience.
- Such owners only chose to start their own firms when a lucrative business opportunity presented itself.
- Twelve per cent became SMME owners when they joined the family business.
- Less than five per cent were unemployed and tired of searching for their first job when they started their own businesses. Very few owners of SMMEs were from the unemployed strata (Chandra, Moorty, Rajaratnam & Schaefer 2000: iii).

Devey, Skinner and Valodia (2003) observe further constraints on youth participation in the informal economy:

- Informal employment is concentrated in the retail and wholesale trade with just over 50 per cent of all informal workers located in this sector of the economy.
- Employment in the informal sector is dominated by semi-skilled work such as shop and craft-related work, and unskilled work.

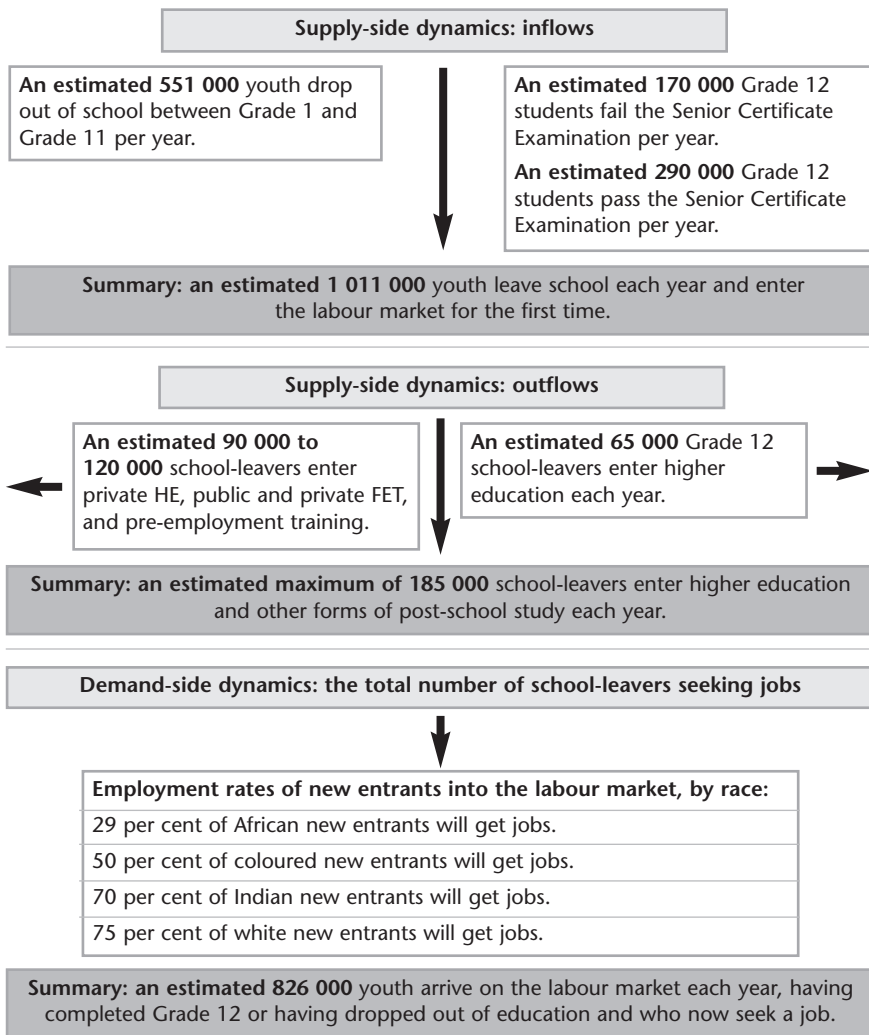
Given that work in this sector involves some semi-skilled activity, youth inexperience may act as a disincentive to participation. It is clear from all the problems described above that there is an acute mismatch in the youth labour market between the outputs of schooling, the possibilities for either further and higher education or pre-employment training, and the actual employment opportunities available in the labour market.

Figure 2 on page 30 captures the dysfunctional through-flows from the supply side into the demand environment, currently occurring in this institutional subsystem. It shows that, of the estimated 1 011 000 school-leavers making up the annual cohort that enters the labour market for the first time, an estimated 65 000 enter public higher education and an estimated 90 000 to 120 000 enter public and private further education and training (FET), private higher education and training, and pre-employment training.² This leaves an estimated 826 000 school-leavers seeking jobs each year as first-time entrants into the youth labour market.

Table 6 on page 31 disaggregates further the employment/unemployment rates represented in the flow chart captured in Figure 2 by population group. From Figure 2 and Table 6 we can deduce that, of each annual school-leaving cohort that enters the labour market or post-school study for the first time (Grade 12 learners plus the dropouts from other grades), seven per cent enter public higher education, twelve per cent enter other forms of further and higher learning (private higher education, public and private FET colleges, and pre-employment training), 30 per cent get jobs, and 51 per cent are unemployed. The latter unemployment figure corresponds with estimates by McCord and Bhorat (2003) for unemployment in the 15 to 24-age cohort, which are between 50 and 63 per cent.

All these figures suggest that there are serious problems to be faced in resolving the articulation between the schooling system and the youth labour

Figure 2 Average annual through-flow of school-leavers entering the youth labour market for the first time, 2000–2002



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Source: Author calculations. The supply-side flows are calculated from data in Akoojee 2003; Badroodien 2003; Perry and Arends 2003; Subotzky 2003a; Subotzky 2003b. The demand-side employment trends are calculated from data in McCord and Bhorat 2003.

Note: The flow in the figure is calculated as the average of the through-flows over a two-year period, 2000 to 2002.

Table 6 Estimated number of annual school-leavers who enter the labour market for the first time and get a job, 2000–2002

Population group	Percentage distribution of the South African population	Total number of school-leaving first-time entrants into the labour market	Employment rate of school-leaving first-time entrants into the labour market	Number of school-leaving first-time entrants into the labour market who acquire jobs	Number of school-leaving first-time entrants into the labour market who fail to acquire jobs
African	77	636 020	29	184 446	451 574
Coloured	9	74 340	50	37 170	37 170
Indian	3	24 780	70	17 346	7 434
White	11	90 860	75	68 145	22 715
Total	100	826 000	37	307 107	518 893

Source: Compiled by the author on the basis of data captured in Akoojee 2003; Badroodien 2003; Budlender 2003; McCord and Borat 2003; Perry and Arends 2003; Subotzky 2003a; Subotzky 2003b

market. The South African schooling system and institutions associated with the youth labour market are not providing an effective channelling mechanism for allocating young people from school into useful post-school activity.

Disjuncture in the youth labour market

It is evident from this analysis that an estimated 51 per cent of all school-leaving first-time labour market entrants will fail to secure jobs, and this figure rises to 71 per cent per year for African first-time entrants. The primary contradiction here is that, as the school system has grown over the past decade, so the number of formal sector jobs available to school-leavers has shrunk.

There are a number of factors that determine this institutional disequilibrium. First, the fundamental problem facing the youth labour market is the low-growth, low-employment scenario, characteristic of the South African economy. Second, it is likely that the actual or perceived poor quality of South African schooling (particularly in the former African school system) serves as a major disincentive on the demand-side for employing large numbers of first-time entrants to the labour market, with qualifications equivalent to matriculation or less. This demand-side disincentive adds further fuel to the 'skewing effect' of the ever-increasing capital and skills-intensity in production.

Third, learners making poor subject choices also contribute to this weak through-flow from school to work and further study. Learners and their parents make subject choices shaped by social and cultural values, which are largely prejudiced against school-based technical education or college-based vocational training. This results in low enrolment levels in the former, and the ‘inverted triangle’ problem in the latter (that is, although college enrolments have increased, enrolments in technikons and universities remain significantly higher, creating the ‘inverted triangle’ institutional landscape unique to South Africa).

In addition, because of the legacy of poor quality ‘Bantu education’, few learners out of the largely African schooling system have acquired the grades and subjects necessary for access into higher education. Even when learners acquire the right grades and subjects, widespread poverty has prevented large numbers from enrolling in higher education. Hence, an institutional impasse has emerged in the youth labour market, with one institution (schooling) unable to articulate effectively with the other institutions (the world of work, further education and training and higher learning).

Government policies have been formulated, and are being implemented, which seek to deal with the severity of the lack of jobs, for example, through large-scale public works schemes and associated training initiatives. The latter have been widely discussed and were recently agreed upon by government, business and labour, at the Growth and Development Summit of 7 June 2003.

Other initiatives aimed at the youth labour market include the extension of the child welfare grant up to the age of 14, the work of the Umsobomvu Youth Fund, learnership initiatives, and training and employment generation activities of the non-governmental development sector.

However, far more powerful structural, institutional and behavioural changes are required if these problems are to be overcome. A new economic growth trajectory will be needed, which creates labour-absorbing, low-skill employment on a large scale, alongside the expansion of higher value-adding exports (see Chapter 5 of this book for an elaboration of such a multi-pronged employment and HRD strategy). Dramatic improvements in the quality of primary and secondary schooling will also be needed, so that the enhanced capabilities of school-leavers will have the effect of stimulating the demand for matriculants in the world of work, and increasing the inflows into higher education. Additionally, more credible and higher quality technical and voca-

tional education routes will be needed, alongside a concomitant set of changes in societal attitudes towards vocational careers.

Resolving this disjuncture between increasing outflows from schooling and shrinking labour market opportunities will require action across several interdependent domains: new employment policies, economic sector growth strategies, public works schemes, child welfare policy, quality assurance in education, improved achievements in Grade 12 examinations, student financial aid schemes, and technical and vocational education policies. This requires 'joined-up' policy and implementation far in excess of what has already been achieved by government. This fundamental contradictory outcome will be more effectively solved if the diverse array of institutions, which underpin the problem in the first place, are encouraged to interlock more effectively, through appropriate government policy levers introduced simultaneously across the institutional subsystem. Single government department initiatives without complementary cross-sectoral action will have significantly less impact.

Notes

- 1 I am grateful to Trevor Coombe of the national Department of Education for these insights.
- 2 The estimated figure of 90 000 to 120 000 school-leavers who enter private higher education, public and private FET colleges and pre-employment training annually was derived in the following way: in public FET colleges, 34 per cent of the 350 465 learners enrolled in 1998 were in the 15 to 19 age cohort. In private FET, 25 per cent of the 706 884 learners enrolled in 2002 were in the 18 to 22 age cohort. In private higher education in 2001, 30 229 students were enrolled in private institutions independent of partnerships with public institutions (the other 55 428 students enrolled in public-private partnerships were largely education students who were not recent school-leavers doing further diploma courses at Afrikaans universities). Pre-employment training in 2002 totaled 34 389 learners in new apprenticeships and learnerships. All of these categories total 360 497 learners. However, these data sets are not age-specific, nor recorded in the same year. Two data sets refer to the age categories 15 to 19 and 18 to 22, while two others are not age-specific at all. This poses difficulties for determining through-flow to these institutions per annual cohort of school-leaving youth. Given that there are at least three if not four age cohorts in most of the figures,

the total number of school-leaving learners entering public and private FET colleges, private higher education, and pre-employment training each year can be estimated as a third or quarter of the total of 360 497 learners (Sources: Chapters 5, 7, 13 and 15).

3 The world of work

The second institutional subsystem that plays a pivotal role in human resources development in South African society is the world of work, and its associated institutions of enterprise training. This is a colossal institutional nexus, involving the labour market, state economic agencies, collective employer organisations, organised union movements, privately owned firms, training institutions and programmes, individual workers, government economic and employment regulations, and workplace socialisation processes (see Table 1 in Chapter 1 for a list of key institutions in this subsystem).

Of greatest relevance to HRD in this institutional nexus are all those institutions involved in the process of traversing the labour market throughout working life. The concept of 'traversing' refers to the movement of people into and out of employment throughout their working lives. 'Traversing' also refers to the mobility (or lack thereof) of workers up the occupational ladder through training and promotion policies.

A number of institutions and state policies impact on the process of labour market 'traversing'. The discussion that follows touches on the most important of these, that being the national economy and its associated institutions of enterprise training. Government's important macro-economic achievements, particularly economic stability and fiscal deficit reduction are outlined. These gains in recent years have led to a more expansionary budget. Other important economic achievements, such as the improvement in manufacturing exports, are also discussed.

The discussion then shifts to focus on the negative effects of the growth path currently pursued by government. In part, the persistence of a low-growth, low-employment scenario and an increasing dependency on capital and skills-intensive production (especially in the growing export sector) has led to rising levels of unemployment across the country.

The section concludes by arguing that negligible internal labour market mechanisms currently exist, particularly given the historical absence of a strong enterprise culture of skills training and work reorganisation. Poor

internal labour market mechanisms have the effect of weakening employment conditions particularly in terms of upskilling, increased productivity and employment security.

Government's macro-economic achievements

The Growth, Employment and Redistribution (GEAR) strategy was introduced in 1996. Government's primary goal with GEAR was macro-economic stabilisation, which was characterised as the essential prerequisite for economic growth, employment and redistribution. This was to be achieved through orthodox stabilisation policies, with fiscal austerity and monetary constraint being the main levers to reduce demand and hence reduce the balance of payments deficit. Macro-economic stabilisation was to be complemented by trade liberalisation, financial liberalisation and privatisation to reduce market distortions and promote the effective functioning of the economy (McCord 2003).

The government has been largely successful in meeting these objectives, particularly macro-economic stability. While progress on tariff liberalisation, privatisation, and the provision of infrastructure has been less successful, the government has broadly met its macro-economic policy objectives, and by 2000/01 was able to start relaxing the more stringent of its fiscal controls, although monetary controls have remained largely in place.

Reducing the fiscal deficit

One of the first major financial challenges to face the newly elected democratic government after 1994 was significant provincial government overspend, particularly in education, health and welfare. A major driver of this over-expenditure was the implementation of the nationally negotiated salary agreement for all civil servants in 1997, which occurred alongside the implementation costs of new national policies in these sectors. These developments led to a combined deficit of R5.6 billion in 1997/98. In order to return spending to a sustainable trajectory, expenditure growth was significantly reduced by 1.8 per cent in real terms by 1999/2000. As a consequence of this fiscal austerity, the provincial deficit was reduced to R0.6 billion in 1998/99, and transformed into a surplus in subsequent years. During the 1996 to 2000 period the fiscal deficit as a percentage of GDP fell from 4.6 to 2.0 per

cent (McCord 2003). Government expenditure has remained stable as a percentage of GDP since 1996/97, at approximately 26 per cent, and is relatively high compared to developing country norms. In real terms, however, this translates into expenditure growth rates of only 0.4 per cent in 1997/98 and negative growth during the 1998/99 and 1999/2000 period (McCord 2003).

The fruits of fiscal restraint: a more expansionary budget

An important consequence of this initial fiscal constraint and the ensuing macro-economic stabilisation has been the gradual expansion of state expenditure since 2001 (McCord 2003). Significant increases in public spending are evident in the 2002 budget, with projected annual growth in real non-interest expenditure of 4.1 per cent over the period 2002/03 to 2004/05, funded in part from declining debt service costs which are projected to fall from 4.8 to 4.1 per cent of GDP, freeing R10 billion for additional spending (McCord 2003). The 2002 budget represents a more expansionary stance, in recognition of the fact that sustainable growth is not only contingent on a sound macro-economic and fiscal position, but that investments in infrastructure and human capacity and skills are also critical. The 2002 fiscal framework therefore focused on:

- Increasing resources for social spending with emphasis on poverty and vulnerability.
- Increasing investment in infrastructure, focusing on extending service delivery and economic opportunities to the poor.
- Ensuring sustainable real increases in government spending by maintaining limits on the level of debt-service payments.
- Reducing tax rates to reduce employment cost and boost consumer spending.

In the 2003 budget, the provinces got R38 billion more to finance social grants, school textbooks, medicines, road maintenance and infrastructure spending, and HIV/AIDS programmes. The expansionary tone of the 2003 budget was emphasised by the fact that after coming in at 1.4 per cent of GDP in 2002/03 and 1.5 per cent in 2001/02, the deficit would expand to 2.4 per cent of GDP in 2003/04 (*Pretoria News* 27 February 2003).

Wildeman (2003) argues that school education expenditure since 1994 has reflected the ups and downs of fiscal austerity and its more recent relaxation. Expenditure rose by 22 per cent in 1996/97 as a consequence of the 1996 salary agreement and increased education sector wage, the appointment of

new teachers to reduce poor learner-educator ratios, and the costs of departmental amalgamation. Subsequently education expenditure declined by 9.5 per cent in real terms between 1996/97 and 2001/02 during the period of fiscal cutbacks and voluntary retrenchment packages. The 2000 budget, however, marked a shift towards renewed growth in provincial education spending with projected real expenditure increases of 2.1 per cent a year between 2000/01 to 2003/04 (Wildeman 2003).

The budgeted priority is the improvement of the efficiency of the education system, with investment in enhancing the quality of teaching and learning, scaling up early childhood development, and increasing non-personnel spending. The emphasis is on increasing infrastructure allocations in order to reduce maintenance backlogs and expand investment in previously disadvantaged areas, while also ensuring adequate provision of materials and complementary inputs. Partnerships with the private sector are being promoted to leverage additional investment in this area (Wildeman 2003).

Improved manufacturing exports

Government trade liberalisation initiatives and certain industrial policy levers have seen a significant growth in higher value-adding manufactured exports. Exports have grown at an average of 5.5 per cent per annum during the 1991 to 2000 period. A disaggregation of this data reveals that exports emanating from the primary sector (agriculture and minerals) declined by -1.5 per cent per annum, while manufacturing and services exports increased by 11.2 and 9.9 per cent per annum respectively (Altman & Mayer 2003).

In the manufacturing sector, exports as a proportion of total output doubled between 1994 and 2001, from 14 to 28 per cent (DTI 2002b). A disaggregation of manufactured exports reveals that most sectors have experienced an increase in exports. The highest weighted average annual growth in exports occurred in furniture (28.9 per cent), television and communications equipment (27.6 per cent), transport equipment (23 per cent) and plastic products (22 per cent) (Altman & Mayer 2003).

Of note is the rapid growth of exports in the automotive industry, which averaged 20 per cent during the 1991 to 2000 period. This occurred in the context of targeted policy interventions within the framework of the motor industry development programme (MIDP), and therefore cannot be attributed to

trade liberalisation alone (Altman & Mayer 2003). In 1996, before the impact of the MIDP kicked in, South African motor manufacturers exported just 11 500 vehicles worth R750 million. In 2002, exports topped 130 000 cars worth more than R15 billion. Automotive component exports have also soared from just over R4 billion in 1996 to well over R20 billion in 2002. Annual vehicle exports are soon expected to reach the 200 000 mark (*Pretoria News* 19 March 2003).

German manufacturers have led the way in this regard. At least 75 per cent of C-class Mercedes-Benz cars built at Daimler-Chrysler's East London plant are shipped overseas. VW has been a major supplier of Golfs to European markets and at least three-quarters of the 3-series BMWs built in Pretoria also leave South Africa's shores. All three companies have been integrated into their global parents' production networks.

Exports to Africa have also grown dramatically by 507 per cent over the 1992 to 2001 period. The bulk of this trade is focused on the SADC region. Approximately 80 to 90 per cent of manufactured exports are destined for SADC markets. If SACU markets are included, Africa becomes the second largest export market after the European Union (Altman & Mayer 2003).

Contractionary effects

Government's economic achievements with respect to macro-economic stability and export markets have unfortunately had their downside, particularly with regard to economic growth and employment. The next section highlights the contractionary effects of government's monetary and fiscal policies.

A low-growth, low-employment scenario

GDP growth has been declining in South Africa since the 1970s, falling from an average of six per cent during the 1960s, to three per cent in the 1970s, two per cent in the 80s, and 1.3 per cent in the 1990s. The Asian economic crisis and consequent slowdown in the global economy impacted negatively on South Africa in 1998/99, with real growth falling to 0.8 per cent, its lowest level during the current dispensation (McCord 2003). The subsequent recovery in 1999/2000 and 2000/01 was undermined in 2001/02 by the onset of the global slowdown that accelerated following the events of September 11th.

McCord (2003) argues that this low and declining growth trajectory is unlikely to improve significantly in the short to medium term due to ongoing domestic and international constraints. In comparison with other emerging markets South African growth performance has been poor.

Unskilled labour-intensive exports declined from 8.9 to 6.8 per cent of total exports between 1992 and 1999, while human capital-intensive exports increased from 49.5 to 58.5 per cent during the same period (Lewis 2001). Moreover, an analysis of factor intensity in exports finds that South Africa has a remarkably low, and declining, share of exports that use unskilled labour, and a relatively high share of exports using more skilled labour (Lewis 2001). This explains why the manufacturing sector has not created jobs despite the rapid growth in exports (Altman & Mayer 2003; McCord 2003; McCord & Bhorat 2003). On the contrary, there has been an ongoing 'skewing effect' whereby manufacturing exports have tended to be capital and skill-intensive leading to an increase in the demand for skilled labour.

The consequences: rising unemployment

One of the consequences of this low-growth, low-employment scenario and its skewing effects on the demand for skills, has been an increase in unemployment levels in South Africa. The official unemployment rate for 2001 is 26.4 per cent, using the narrow definition of unemployment, while the broad rate is 37 per cent, a figure that includes those who are not actively seeking work and are characterised as 'discouraged' workers. This level of unemployment implies a jobless total of seven million, with more than 40 per cent of the rural population unemployed (McCord & Bhorat 2003). Unemployment takes its most extreme form amongst African women in rural areas reaching a high of 47.2 per cent.

Increases in informal sector employment

The obvious counter-trend to significant declines in employment in the formal economy is growth in the informal sector. An estimated 25 to 30 per cent of those working in South Africa are engaged in the informal economy, including subsistence agriculture and domestic work. Table 7 highlights the growth in the sector since 1996.

Table 7 Informal sector employment, 1996–2001

Year	Informal sector employment
1996	996 000
1997	1 136 000
1998	1 316 000
1999	1 907 000
2000	1 933 000
2001	1 873 000

Source: Devey et al. 2003

Much of this growth has to do with more accurate measurement techniques employed by Statistics South Africa in its Labour Force Surveys. However, there is no doubt that as formal sector employment has declined over the past decade, so the number of people seeking refuge in the informal economy has increased.

These figures also reflect the growth of insecure forms of employment with extremely low incomes. Such a push into the informal sector is far less positive than the pull that can occur in an expansionary period. The former is typified by weak entrepreneurial producers who are poorly skilled and who enter into already crowded markets, rather than skilled, experienced and entrepreneurially motivated entrants who move into higher value niches.¹

Training in SA enterprises

A second important institutional form, which impacts on the process of ‘traversing’, is the vocational training system. It usually takes two forms – training provided either externally or internally to the enterprise. External labour market training is often employed as a strategy to combat unemployment in training schemes run by state, employer or tripartite bodies. Training is also viewed as a key internal labour market device geared to raising the productivity and skill levels of employed workers in enterprises. Unfortunately, training in South Africa in both its external and internal labour market forms has a poor history, firstly because of apartheid government restrictions on the training of black workers, but secondly because of employer apathy in this regard. These structural and behavioural features still persist today.

South Africa's training rate

The 'aggregate training rate' measures the average rate of training across the total employed population. Badroodien (2003), in a review of five large scale studies of enterprise training in South Africa, concludes that South Africa has a mean annual training rate of between 20 and 30 per cent of the employed workforce across the national economy.

The Department of Labour has set up other success indicators of training. One such measure is the extent of participation in the newly implemented skills levy system and the disbursement of training grants to firms that develop workplace skills plans. The Department of Labour noted that a bit more than R3.2 billion was collected from 120 225 firms through skills levies for the year 2001/02. Updated figures released by the Department of Labour in November 2002 indicated that the total number of firms paying the skill levy had risen to 136 645 out of 208 697 eligible firms (those registered for tax purposes) (DoL 2002d: 5).

Amongst the 136 645 firms who pay the levy, it appears as if only about 14 261 grants were disbursed to them in 2002 (DoL 2002d: 10). This suggests that at most, only 10.4 per cent of levy-paying firms are effectively participating in the levy-grant system (assuming that one grant equals one participating enterprise, which is unlikely to be the case as the levy-grant system allows for two grants per enterprise to be made – one pre- and one post-training). These participation levels are problematic if the *National Skills Development Strategy* (NSDS) is to have any real chance of success.

Size of firm plays a major role in explaining this low uptake of the levy-grant system. Table 8 on page 43 shows the latest data on training in terms of firm size. This data is better understood if read in relation to the classification of firms by size. In a study undertaken by Ntsika in 1999, it was determined that 72 per cent (or 650 000) of 900 000 establishments in South Africa were at the very small and micro end, employing between one and four workers each. In contrast, 72 239 small, medium and large (SML) establishments constituted only 8.4 per cent of the total number of establishments in South Africa, yet they employed 5 295 800 workers or 72 per cent of the total workforce (Ntsika 1999: 5). Large establishments constituted less than one per cent of the total number of establishments in South Africa but employed about 43 per cent of the total workforce in the private sector (Ntsika 1999: 4).

Table 8 Success of the *National Skills Development Strategy*, by firm size, 2002

Government success indicators	Extent of success
Large firms: at least 75 per cent of enterprises with more than 150 workers have to be receiving skills development grants by March 2005.	NSDS performance: in March 2002 almost 67 per cent of enterprises in this category were providing workers access to skills training (DoL 2002b). This percentage is high because, although only 0.7 per cent of all enterprises are large firms, they employ 42.7 per cent of all employees (Ntsika 1999: 5).
Medium firms: at least 40 per cent of enterprises employing between 50 and 150 workers should be receiving skills development grants by March 2005.	NSDS performance: by March 2002 about 38 per cent of levy paying medium-sized firms were accessing grants through developing workplace skills plans (DoL 2002b).
Small firms: at least 20 per cent of new and existing registered small businesses have to be supported in skills development initiatives by March 2005.	NSDS performance: only seven per cent of levy-paying small employers were providing training in March 2002 (DoL 2002b).

Source: DoL 2001 and Badroodien 2003

The data above reveals the very important correlation between firm size and training output. Clearly, the most significant challenge facing government's HRD strategy is to get the bulk of enterprises in South Africa (72 per cent of which are very small) to train, become more successful businesses, and absorb a much greater proportion of the available workforce.

In another important 'success indicator', government is attempting to place at least 15 per cent of employed workers in structured learning programmes by March 2005. The progress with regard to the indicator is encouraging. During the financial year 2001/02, a total of 1 002 201 workers participated in structured learning, including NQF Level 1 programmes (the equivalent of Grade 9). This is out of a total workforce of 9.3 million people (DoL 2002d: 9).

This data suggests that roughly 10.7 per cent of the total workforce have received some form of structured training in financial year 2001/02 (DoL 2002d: 9) – that is, 67 per cent of government's target has already been attained. Reports for the first two quarters of 2002/03 indicate that 1 166 216 employees had been trained (DoL 2002d: 9) suggesting that the training rate is increasing significantly year by year.

In addition, 1 002 201 employees trained during 2001/02 compares very favourably with the very low levels of training reported under the old apartheid training regime – which hit an all time low of 152 870 persons in 1998 and representing a training rate of below three per cent as a proportion of the total workforce (Kraak et al. 2000). However, the apartheid era data reflects only officially reported data, signifying a massive undercount of unreported training. The NSDS data is more likely to report realistic levels of training via SETA information systems.

However, the target set by government still constitutes a very small minority of the total employed workforce, and government will need to expand the scale of training if a larger segment of workers is to benefit from enterprise training in the medium term.

In addition, much of this training was of the short-course variety and narrow in focus to meet specific employer requirements (Kraak et al. 2000: 52). It included training of the ‘soft’ variety, for example, training in health and safety issues or on industrial relations, and far less of the ‘hard’ variety that would lead to whole qualification acquisition and significant upskilling of the workforce along the National Qualifications Framework.

The absence of lifelong learning

A third important institutional form, which impacts on the process of ‘traversing’ the labour market, is the further and higher education systems. In particular, these educational institutions provide opportunities for adult and continuing education to employed adult workers via distance, part-time and Internet study. Regrettably, the South African further and higher education systems are characterised by a bias towards young, pre-employed students. Lifelong learning opportunities for older, employed workers in colleges, technikons and universities are largely absent.

Participation rates in the FET college sector compare poorly with the participation rates for other countries. As data in Table 9 makes clear, the majority of learners in South African technical colleges are young, with 93 per cent being in the 15 to 35 year age group and 74 per cent in the 15 to 24 year age group. Enrolment in South African technical colleges thins out after 25 to 29 years of age. By comparison, enrolment in the Australian Technical and Further Education (TAFE) colleges picks up again at this age, with the 30 to 34 year

cohort increasing to 22 per cent, and the 40+ cohort constituting 27 per cent of total enrolment (Fisher et al. 2003).

There is clearly minimal practice of lifelong learning in the South African post-school technical colleges. The colleges function primarily as an adjunct to the school system, and service mainly post-school youth. Inevitably, the college system will become a 'second chance' add-on to schooling, in the context of a weak schooling understructure.

Table 9 Age distribution of total enrolment of South African and Australian technical college learners, 1998 (in percentages)

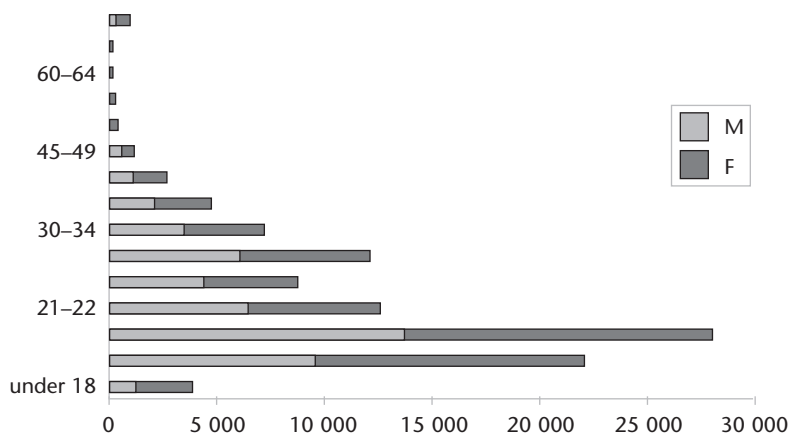
Age cohort	South Africa	Australia
<15	0.1	0.5
15–19	34.0	21.0
20–24	40.0	17.0
25–29	19.0	13.0
30–34	6.9	22.0
40+	0.0	27.0

Source: DoE and DoL 2001

These practices are also evident in the HE sector. Figure 3 on page 46 highlights the age profile of total first-time enrolments of university and technikon students. The bulk of these students are in the 18 to 34 age category. Enrolment then dips to a very low level in the 35+ age category.

This shows that few older working students are coming back to the HE sector to retool and update their skills. The South African post-school education and training system has not modernised and massified to the extent of other systems in the world, which have adapted significantly to the needs of adult and continuing education.

The lack of a lifelong learning culture is not only a supply-side problem. It arises equally from the demand side: employers are reluctant to release employees during working hours, and rarely sponsor adult and continuing education amongst their workforces.

Figure 3 Age profile for universities and technikons for 1998

Source: DoE and DoL 2001

HIV/AIDS and the labour market

The HIV/AIDS epidemic is a humanitarian disaster in terms of loss in human life and suffering. But its devastating impact extends way beyond the health realm, acting to weaken the skills base of the employed workforce. HIV/AIDS impacts disproportionately on specific categories of the population, particularly the age group 15 to 49 years who comprise a critical component of workers with significant accumulated human capital.

The Medical Research Council (Dorrington, Bourne, Bradshaw, Laubscher & Timaus 2001) attributes 40 per cent of mortality in the 15 to 49 year age group, in 1999 and 2000, to AIDS. As a consequence, the total labour force may be at least 21 per cent smaller in the next decade compared to a 'no-AIDS' scenario as shown in Table 10.

It is clear that government will need to align social welfare and health policies alongside labour market and education and training policies in a comprehensive bid to overcome this huge constraint on accelerated human resources development in a future South Africa.

Table 10 Projected changes in the size of the labour force (millions) (2000–2015)

	'No-AIDS' scenario (millions)	AIDS scenario (millions)	Percentage difference
2000	14.5	14.4	-0.7
2005	15.8	15.1	-4.0
2010	17.2	15.1	-12.0
2015	18.7	14.8	-21.0

Source: Vass 2003

Key factors impacting on HRD in the world of work

As the above analyses suggest, four dominant processes are currently afoot in the world of work. Each poses severe problems for HRD: (i) a tendency towards capital and skills intensity in production, (ii) job shedding at the low and intermediate-skill levels; (iii) few external (lifelong learning) and internal (enterprise training) labour market mechanisms operating to the benefit of workers; and (iv) a threat of dramatically increased mortality rates amongst the 15 to 49-year-old working cohort.

As discussed earlier, this scenario derives from historically and culturally inherited employment and training practices. New institutional arrangements have been put in place as part of the NSDS (through the 25 sector education and training authorities). However, even though these new institutions have had a short lifespan, many are already facing serious problems of mismanagement and incapacity. The Department of Labour has tabled amendments to the Skills Development Act, to empower the Minister of Labour to intervene more decisively in addressing these problems (*Pretoria News* 16 July 2003). Both the culturally inherited disinclinations to train, and the current institutional difficulties, present the new training structures with huge challenges.

Dualism in the world of work

What is evident in this institutional subsystem, comprising the national economy and its associated institutions of enterprise training, is an all-pervasive imprint of dualism and segmentation. A progressively advancing high-technology export sector is leaving behind a larger intermediate-skill middle

economy and a low-skill peripheral economy, with both characterised by fewer formal sector jobs, and minimal skills development. There are a number of contradictory processes that contribute to dualism:

- First, the low levels of positive economic growth and the impressive expansion of manufacturing exports have not created jobs in the way that neoclassical economics would have us believe. On the contrary, jobs are being simultaneously shed at the low and intermediate levels, as industrial production shifts to greater capital and skills intensity.
- Second, this ‘skewing’ phenomenon has the effect of accentuating the ‘dual economic’ divisions described by President Mbeki (see full quotation of Mbeki’s comments in Chapter 5 of this book); divisions long established in South Africa under both colonial and apartheid rule.
- Third, whilst an impressive array of new institutions for co-ordinating enterprise training has been set up (the 25 SETAs), and whilst nearly R3 billion has been collected via the levy-grant system, employers’ attitudes toward training and improving internal labour market mechanisms remain largely unchanged.
- Lastly, government’s industrial policies have had mixed success. Whilst making progress with increased exports and certain spatial development initiatives (such as in basic minerals beneficiation and aluminium smelting), these gains have also led to greater capital and skills intensity, and the neglect of pump-priming activities aimed at triggering large-scale, labour-absorbing, low-skill, sector-specific employment growth.

According to McCord (2003), what is required in addressing this fundamental dualism is, first, the orientation of investment towards the generation of high-end as well as low-end employment opportunities; second, the implementation of a package of welfare transfers (through unemployment benefits and/or massive public works programming) to compensate for the unavailability of wage labour opportunities, and to stimulate the domestic economy; and third, greater relaxation of government’s monetary and fiscal policies, and the adoption of a more expansionary stance, in order to stimulate economic growth from within.

The most likely avenue for creating employment is by increasing effective domestic demand for more non-traded goods and services that absorb employment and accommodate low labour productivity. Altman and Mayer (2003) argue that the promotion of non-traded goods and services, such as housing construction and public works, has long been a part of Keynesian

employment programmes, elements of which have been present in most South African economic policy documents since 1990. Housing and social infrastructure development, in particular, is seen to stimulate construction, and provide essential assets to households that could be used as the basis for other small business development. Hence, the strategy concentrates on the potential crowding-in of public investment, particularly in conjunction with small business support measures. In the context of a relatively small productive base, and large unproductive and underproductive sectors, the balance between high productivity, income-generating sides of the economy, and sustainable transfers to socially useful lower-productivity activities is quite critical, particularly if sustained for a lengthy period of, say, ten to 15 years (Altman & Mayer 2003).

Again, what is being proposed is the more aggressive 'joining up' of economic, industrial, firm-based, and education and training policies, so as to create one overarching and coherent economic and human resources development strategy for the medium to long term. Each of the elements in such a policy package are interdependent; the success of one policy element (for example, training) being highly dependent on other elements being implemented and succeeding (for example, the kick-starting of labour-absorbing employment growth, and changes in employer approaches to training).

Notes

- 1 I am indebted to my colleague, Dr Simon McGrath from the HSRC, for this important insight.



4 The national system of science and innovation

The third key institutional subsystem that underpins human resources development is the national system of science and innovation, particularly all those institutions and processes entailed in moving up the production value chain. A key requirement for successful economies and skill formation systems in the new global economy is the need to move the majority of productive activities up the value chain toward higher value-added manufacturing production and services provision. Moving up the value chain is a competitive strategy aimed at improving a company or a national economy's relative position in the world economy. It entails shifts within key sectors of the economy from 'niches of low value added and high competition to niches of higher value added and lower competition' (Kaplinsky 1995: 6).

National economies that have moved up the value chain successfully over the past two decades are the rapidly industrialised Pacific Rim countries. Their development paths have, in most cases, evolved in four phases, moving initially from low value-added production in labour-intensive industries aimed at the internal market, to mass production of these products for the export market, and then finally, towards deepening export production in the direction of higher value-added products for example, high quality micro-chip, computing and consumer electrical equipment. In Singapore's case, the most recent fourth phase has been characterised by the growth of knowledge-based service industries (Ashton & Green 1996: 160; Brown et al. 2001: 90). Recent government policy in Singapore has placed less emphasis on manufacturing and more on making that country the high-technology financial hub of the region.

The concept 'moving up the value chain', therefore, characterises a nation's attempts to become more globally competitive through the application of greater knowledge intensity in production and a shift to greater export-oriented manufacturing and high-skills services provision.

Moving up the value chain is not restricted to the high technology, high-skill sectors of the economy. It is a process, which also incorporates the attempts by the older 'middle' economic sectors (largely mass-production manufacturing and mining enterprises heavily dependent on intermediate skills) and the low-

skills sectors, to continuously seek to improve production methods, outputs and employment levels.

The key inputs in the process of moving up the value chain are: enterprise restructuring; government science, technology and industrial policies; and the ongoing commercial application of scientific innovation in industry, supported by the science councils and higher education institutions.

South Africa currently faces several constraints in its attempts to move up the value chain. These are: the partial impact of new industrial policies; poor performance against international benchmarks; a weakening science base; and the decline in the national science and innovation system. Each of these is outlined in more detail below.

The partial success of South Africa's industrial policy

South Africa, as a minerals and resource extraction economy, began adopting import-substituting industrialisation policies as early as the 1920s. These policies were consolidated in the boom years of the 1960s and the sanctions era of the 1980s. This fundamental approach to industrial policy was not really changed until the mid-1990s. This route stands in sharp contrast to export-oriented industrialisation which began in the Pacific Rim countries in the 1970s and 1980s and which sought to build an industrial base with production geared to external markets, so generating economies which lowered costs and fostered international competitiveness.

Altman and Mayer (2003) argue that the key issue for South Africa surrounding these two approaches centres on their sequencing and timing. While tariff protection is deemed to be an appropriate measure to encourage the development of infant industries, it is believed that such protection should gradually be removed if the manufacturing sector is to become internationally competitive. Export-oriented industrialisation strategies generally follow some import-substituting industrialisation. There is now widespread consensus that South Africa's failure to shift to export-oriented industrialisation policies until the early 1990s has severely constrained the development of the South African manufacturing sector (Altman & Mayer 2003).

Apartheid's development trajectory, based on minerals extraction and import-substituting industrialisation, had several other problems. As Altman

and Mayer (2003) point out, this trajectory created a growth path highly dependent on capital-intensive production processes and skilled labour. This development route, in combination with apartheid's segregationist policies, led to massive unemployment of low-skilled labour in both the rural 'bantustans' and in the black urban townships – a debilitating structural feature of apartheid capitalism that has not diminished in the post-apartheid era.

South Africa's minerals-based economy has leap-frogged the very important development phase that has occurred in most other more successful newly industrialised economies. This development phase, best characterised by the Pacific Rim countries, entails starting from the phase of low wage, low productivity, labour-intensive manufacturing for domestic consumption and export, which then moves on to the advanced phase of large scale capital and skills-intensive manufacturing for export. South Africa's leap-frogging to a model based on limited exports in highly capital and skills-intensive manufacturing production has now become a 'resource curse' restricting South Africa's ability to promote large-scale labour-intensive employment growth through exports (Altman & Mayer 2003).

Government's new knowledge intensive manufacturing policy

The Department of Trade and Industry (DTI 2002a) acknowledges that there is a correlation between industries that have become increasingly export-oriented and high rates of investment in capital equipment and skills-intensive technology. This is seen as a necessary structural change to gear up for international competition and partly accounts for the 26 per cent increase in labour productivity that has occurred since 1994 (Altman & Mayer 2003). Moreover, many of the sectors that have rapidly increased their output are less labour intensive than the manufacturing sector in aggregate (Altman & Mayer 2003).

Government has introduced other measures in addition to trade liberalisation to transform the national economy, shift the industrial base more assertively up the value chain, and open South African firms up to increased global competition. The most important of these has been industrial policy, notably the shift from demand to supply-side policies as the main instruments of change. The highly successful Motor Industry Development Programme has already been discussed. Other supply-side industrial policy measures include: the

Duty Credit Certificate Scheme for the clothing and textiles sector; black economic empowerment; the development of the small, medium, and micro enterprise (SMME) sector; the restructuring of state-owned enterprises in the transport, energy and telecommunications sectors; and Spatial Development Initiatives (SDI) and Industrial Development Zones (IDZ).

Many of these initiatives are in their infant stages, and thorough evaluations are premature at this stage. However, in other cases (notably the promotion of SMMEs and black economic empowerment) the DTI has admitted that they have failed to meet their stated objectives. Altman and Mayer (2003) argue that the SDIs have not shifted South Africa's industrial base away from traditional sectors. Instead, the major SDI investments have been focused on basic minerals beneficiation and on aluminium smelting, which might have taken place anyway.

Against this background of limited success, government revised its industrial policy instruments in 2001 with a new focus on micro-economic reform and an integrated manufacturing strategy. Key elements of the new approach include the development of appropriate and efficient economic and social infrastructure, access to finance for productive activities, investment in research and development, innovation and the take-up of new technologies, as well as investment in human capital and an adaptive, flexible workforce (Altman & Mayer 2003).

In the manufacturing sector, the Department of Trade and Industry's new Integrated Manufacturing Strategy is premised on the view that future competitiveness should be built on increased knowledge intensity and value addition. Government believes that new sources of competitiveness are located in the development of ICT, the impact of technological change on production processes and the importance of time and efficiency with regard to production costs (Altman & Mayer 2003).

To that end, five sectors of the economy have been targeted because government believes they have considerable potential for increased outputs, exports, and employment creation. These sectors are export sectors, agriculture, tourism, ICTs, and cultural industries. Export sectors targeted by government include clothing and textiles; auto, auto components and transport; agro-processing; mining, metals and minerals beneficiation, chemicals and biotechnology; crafts; and information and communication technology (Altman & Mayer 2003).

The jury is still out on whether these new industrial policy measures are succeeding, but what is clear is that structural economic reforms to date have not gone as far as intended by government and success has been partial. The low growth, low employment trajectory of the apartheid economy continues into the present.

South Africa's performance against international benchmarks

There are currently four international benchmarking measures, which rank South Africa's economic competitiveness, human development and HRD achievements. They are: the *World Competitiveness Year Book* published by the International Institute for Management Development, Lausanne; the *Human Development Report*, published by the United Nations Development Programme in New York; the *Africa Competitiveness Report* published by the World Economic Forum in Geneva; and the *Third International Mathematics and Science Survey* (TIMSS), published by the International Association for the Evaluation of Educational Achievement based in Amsterdam. The first two measures report annually, the *Africa Competitiveness Report* has been published periodically, and TIMSS reports every three years. Table 11 provides a summary of the basic rankings achieved by South Africa in the period 2000 and 2002.

Table 11 South Africa's HRD ranking in world benchmarking activities

Benchmark type	South Africa's ranking	Some determining factors
Human Development Index	94th place out of 162 countries in 2001 107th place out of 173 countries in 2002	<p>Positive factors</p> <ul style="list-style-type: none"> • Reasonable expenditure on R&D. • Mean years of schooling for population over 15 has increased significantly over the past two decades. • Good electricity, telephone, Internet and cellular infrastructure. • High expenditure patterns on public education as a percentage of GDP and total government expenditure. <p>Negative factors</p> <ul style="list-style-type: none"> • Low levels of education amongst adult population.



Benchmark type	South Africa's ranking	Some determining factors
		<ul style="list-style-type: none"> • Low levels of scientists and engineers per 100 000 citizens. • Low life expectancy rates. • High percentage of adults (15–49 years) living with HIV/AIDS – 19.94 per cent in 1999. HIV/AIDS constitutes the primary cause of South Africa's decline in the ranking between 2001 and 2002.
Technology Achievement Index (Part of Human Development Index above)	39th place out of 72 countries in 2001 SA was ahead of countries such as Brazil (43rd), China (44th), Algeria (58th) and Indonesia (60th)	<p>Positive factors</p> <ul style="list-style-type: none"> • South Africa has been classified as a 'dynamic adopter'. It shares this category with countries such as Uruguay, Thailand, Brazil and India. • Good electricity, telephone, Internet and cellular infrastructure. • Reasonable 'medium to high technology' exports as percentage of total goods exports. • Gauteng considered one 'technology hub'. The USA has thirteen, the UK has four, Brazil has two and Tunisia and India one each.
World Competitiveness Year Book	42nd out of 49 countries in 2001	<p>Positive factors</p> <ul style="list-style-type: none"> • South Africa the only African country included in the listing. • Marginal improvements since 2000 in certain indices. <p>Negative factors</p> <ul style="list-style-type: none"> • SA occupies almost all the last positions in indices that have to do with educational outcomes, quality and availability of human resources, and science and technology capacity. • SA scored poorly with regard to attitudinal variables such as: work ethics (working hard, innovation and worker motivation), the public understanding of science (especially among the youth), and economic literacy. • SA came last on crime. • SA came second last in terms of skilled emigration.



African Competitiveness Report	7th place out of 24 African countries in 2000/2001	<p>Positive factors</p> <ul style="list-style-type: none"> • Good electricity, telephone, Internet connectivity (came first) and cellular infrastructure. • SA has a very high secondary school enrolment rate as compared with the high drop-out rates in other African countries. <p>Negative factors</p> <ul style="list-style-type: none"> • South Africa was outranked by Tunisia (who came 1st), Mauritius, Botswana, Namibia, Morocco and Egypt. • South Africa came last on crime.
Mathematics and science achievement at school	<p>Last out of 40 mainly developed countries in TIMSS</p> <p>Last in numeracy out of several African countries participating in the MLA.</p>	<ul style="list-style-type: none"> • TIMSS is a school achievement test of Grade 8 students in mathematics and science carried out in 40 countries. South Africa came last in this survey. • The Monitoring Learning Achievement (MLA) is a project of the Unesco/Unicef <i>Education for All</i> campaign. The testing of a national sample of Grade 4 learners in literacy, numeracy and life skills in several African countries is one aspect of this project. In the 1999 test, South Africa had the lowest average score in numeracy.

Sources: Howie 2001; IIMD 2001; UNDP 2001; UNDP 2002; WEF 2000

The rankings in Table 11 suggest that South Africa's standing in the world economy is doubled-edged.

On the one hand, as a middle-level developing country, it is rated poorly in comparison to the HRD, science and technology achievements of industrialised countries.

On the other hand, it displays considerable HRD and S&T infrastructure in comparison with other developing economies in Latin America, Asia, and almost all of Africa. This infrastructure is a key asset and must be built on in the future if we want to improve our international competitiveness.

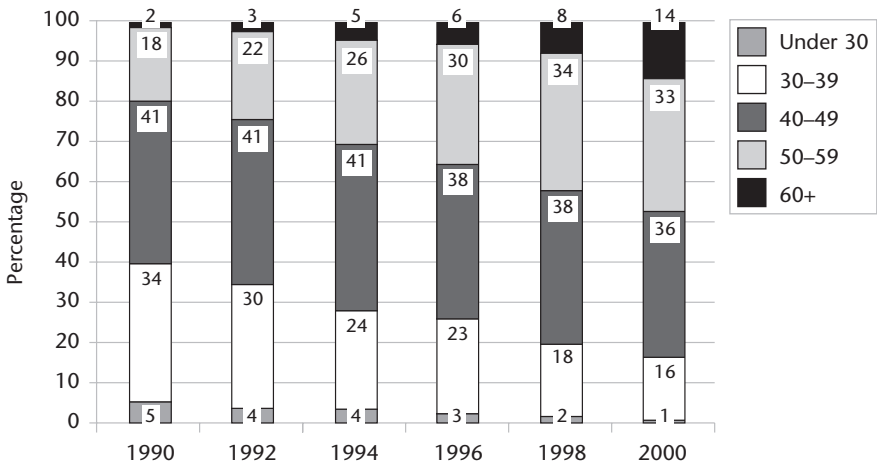
Weakening science base

There is a noticeable weakening in some key elements of the national system of innovation in South Africa. The next section briefly examines certain key indicators in this regard.

Scientific publishing

Research output in South Africa faces two related difficulties. Firstly, the total output of scientific articles has remained static over the past decade with a slight decline since 1997 (Boshoff & Mouton 2003). Secondly, higher education institutions and science councils are struggling to recruit and retain young scholars who can publish. Figure 4 shows that there is a general decline in the number of articles produced by authors in the 30 to 39 and 40 to 49 age cohorts, and a concomitant increase in the output of authors in the 50 to 59 and 60+ age cohorts. This points to a gradual 'ageing' of the publishing population. The most obvious explanation of this trend is that the same age cohort, aged by nearly a decade in the data in Figure 4, is still producing the majority of scientific publications. Combining age and race data suggests that a serious crisis is looming as the white 'over-50' cohort moves closer to retirement with little evidence of a commensurate younger black cohort waiting in the wings (Boshoff & Mouton 2003).

Figure 4 Scientific publications by age cohort, 1990–2000



Source: Boshoff & Mouton 2003

Other indicators of a weakening science base

There are other indicators of a weakening science base in South Africa. Amongst the most acute are:

- **Patents:** South Africa has registered between 101 to 137 patents annually in the period 1990 to 2001 with the United States Patent and Trademark Office (USPTO). In 2001, South Africa recorded the lowest growth in patenting for the decade. Where growth rates for other countries varied between 50 per cent (Poland) and 100 per cent (Russia, the Slovak Republic and Slovenia), South Africa showed only a 12.5 per cent growth in utility patenting. More interestingly, though, is an analysis of the organisational affiliation of South Africans who registered five or more utility patents with the USPTO for the period 1997 to 2001. It shows that the majority of patents are individually owned. The patents registered by organisations occur primarily in the private sector (e.g. Sasol, Denel) and in parastatal organisations within the public sector (e.g. Eskom, AEC). It is significant that universities and technikons do not feature on the list of the top ten patentee organisations at all.
- **R&D expenditure:** South Africa spends 0.77 per cent of GDP on R&D. Comparing this percentage to those of five OECD countries for whom 2000 figures are available (Australia, Canada, Finland, Germany and Spain), South Africa records the lowest gross domestic expenditure on R&D. The other countries' percentages range between 3.36 (Finland) and 0.89 (Spain).
- **R&D workforce:** The R&D workforce is defined as those actively involved in some form of knowledge production (basic and applied research) and experimental development activities. Workers in this category include researchers, technicians, and support staff. South Africa's ratio of 0.7 researchers per 1 000 of the labour force is considerably lower than that of the OECD countries. The same applies to the ratio of 1.6 R&D personnel per 1 000 of the labour force (Boshoff & Mouton 2003).
- **Poor doctoral output:** Doctoral enrolments increased between 1985 and 2000 by 29 per cent – a rather gradual increase of two per cent per year during this period. In terms of gender and race, the majority of students enrolled for post-graduate degrees are still white and male. In addition, post-graduate studies in the human sciences still dominate (Boshoff & Mouton 2003).

Government's *National R&D Strategy* (DST 2002) prioritises three new technology platforms: materials development, information and communications technology, and biotechnology. Each of these new fields requires increased numbers of master's and doctoral graduates to service its R&D and applied research requirements. The graduation numbers, however, are generally not encouraging. In engineering, there has been a positive growth trend in master's graduates (39 per cent) since 1996. Steyn and Daniels (2003) perceive this trend to reflect the higher-level knowledge base required in the new engineering growth sectors. However, the graduation of doctoral candidates in engineering remains low, with numbers fluctuating around an overall declining trend of between 73 engineering PhD graduates in 1997, and 45 in 2000 (Steyn & Daniels 2003).

In information and communications technology, only two per cent of graduates obtained master's degrees in 1999, with very few doctoral students graduating (Moleke, Paterson & Roodt 2003). In the biotechnology industry, there is a shortage of PhD and post-doctoral level graduates specialising in bioinformatics, protein chemistry, entrepreneurial and legal skills, biochips, and combinatorial and computational chemistry/biochemistry. The state's promotion of its new Biotechnology Strategy (DST 2001) is likely to heighten the demand for well-trained doctoral and post-doctoral specialists in the new bioeconomy (Walwyn 2003).

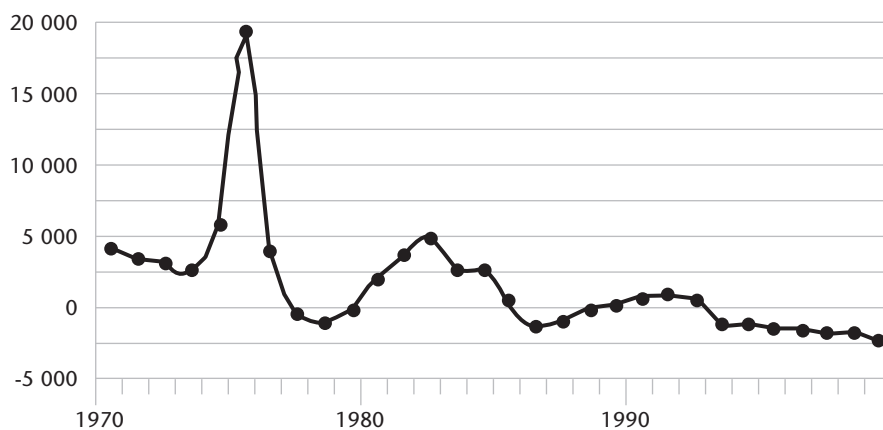
One remaining problem poses additional difficulties for the national system of innovation. This is the loss of skills through emigration that will now be discussed.

Emigration

Meyer, Brown and Kaplan (2000) published the findings of a study of the extent of the official data undercount of emigration in South Africa. They collected data on South African immigrants in the five major receiving countries – United Kingdom, United States, Australia, Canada and New Zealand – for the period 1987 to 1997 and compared these with the official statistics. During these years, the country has lost 233 609 emigrants as opposed to the 82 811 declared and registered by the official South African statistics. This is 2.8 times higher than what the official figures show. With regards to professionals, during the nine years, from 1989 to 1997, the country lost 41 496 skilled emigrants, which is 3.2 times more than the 12 949 officially declared (Bailey 2003).

According to the official statistics, between 1970 and 1993 there was, in general, a net gain of skilled workers in South Africa. There were only two occasions during this period in which there was a net loss of skills (1977 to 1978 and 1986 to 1987). By contrast, from 1994 to 2000, there was a net outflow of professionals from the country, as is clearly evident in Figure 5:

Figure 5 Net migration of professionals, 1970–2000



Source: Bailey 2003

The downward trend in the number of professionals entering the country since 1994 is of concern. Kaplan (1998: 9) suggests that the main reason for this decline is the government's 'restrictive' immigration policy.

Decline in the national science and innovation system

The national science and innovation system faces several problems. First, international benchmarks, such as the *World Competitiveness Year Book*, rank South Africa poorly. One attitudinal factor contributing to this ranking is the low level of public understanding of science, especially among young people. Second, South African school children perform poorly in mathematics and science, both in the largely OECD achievement test, TIMSS, and in the equivalent African initiative, the MLA. Third, there is a serious shortage of well-qualified mathematics and science educators, compounding low achievement scores in these subjects. Fourth, the involvement

of higher education in applied research and R&D is not optimal, as the results of South Africa's registration of international patents show. No tertiary education institutions came in the top ten South African patents registered between 1997 and 2001. Fifth, graduation levels are low in specialised science and technology fields, as highlighted by the earlier discussion on doctoral output.

Taken together, these problems make it very difficult for South Africa to sustain its movement up the value chain towards higher value-added export competitiveness. Instead of having a dynamic and fast-growing science knowledge base necessary to support this level of R&D and innovation, South Africa's science base is, in fact, weakening.

Government has attempted to deal with these complex problems. For example, its new micro-economic reforms, and its integrated manufacturing strategy top the list of priority areas. Government's new *National R&D Strategy* (DST 2002) and the *National Biotechnology Strategy* (DST 2001) are also critical to affect a rapid turnaround in South Africa's science base. In particular, the National R&D Strategy aims to develop science and technology capacity along five critical platforms: information and communications technology, biotechnology, new materials development, technology for poverty reduction, and technology and knowledge for and from resourced-based industries. The strategy also intends to increase the number of women and black scientists in key fields in which they are under-represented. Lastly, Cabinet has committed to doubling the science budget over the period 2004/05 to 2006/07 to finance these reforms.

The call for 'joined-up' policy action is applicable here too. This institutional subsystem is premised on the effective articulation of institutions and policies across the domains of scientific, industrial, employment and economic growth. A dramatic turnaround in South Africa's science system will entail a number of actions:

- Interventions across several government departments that have line-function responsibilities over different science agencies.
- The determined pursuit of industrial policy objectives, particularly the key pillars of micro-economic reform, such as targeting certain new economic growth sectors, improving economic and social infrastructure, and increasing investments in research and development.

- The implementation of a multi-layered economic growth, employment and skills formation strategy that will simultaneously build upon the country's low, intermediate and high skills bases.

Conclusion

The conclusions reached in this chapter and the preceding chapters all point in a common direction. They all argue that government policy should increasingly target the resolution of the several institutional disjunctures raised in the analysis, through simultaneous cross-sectoral government action. These disjunctures give rise to the multi-layered social problems that fall between the cracks of separate government departments. Notwithstanding the progress already made by President Mbeki's government in prioritising 'joined-up' policy-making, policy implementation continues to take place within separate departmental silos.

What is required is a pervasive cross-sectoral mindset across government over the medium to long term. This must extend from the process of policy formulation and planning (where the production and dissemination of cross-sectoral information is critical) in each discrete government department, to the formulation of cross-departmental priorities (such as those emanating from the President's Office, or those agreed at the June 2003 Growth and Development Summit, which included employment growth, poverty alleviation, and HRD), to simultaneous cross-departmental implementation and state steering. It also depends squarely on reliable information being generated and communicated timeously between government departments, so as to inform departmental planning and implementation. Only on the basis of this interconnected governing understructure, will human resources development ultimately flourish in South Africa.

5 HRD and the skills crisis

This chapter presents a critique of the ‘high-skills’ argument, which in the international literature is considered a necessary condition (alongside social market institutions and ‘joined-up’ policy) for the successful expansion of human resources development (HRD).¹ It adds to the conceptual framework introduced in Chapter 1 that argued for the importance of institutions and ‘joined-up’ policy. The chapter argues the case for a multi-pronged HRD approach, comprising a joint high-skills and intermediate-skills strategy on the supply side, underpinned by a demand-driven strategy which seeks to stimulate large-scale labour-absorbing employment growth supported by appropriate inputs of low-level skills training.

Drawing on evidence from Chapters 2 to 27 in the HSRC’s HRD Review 2003, the analysis then examines the actual skills deficit in South Africa in each of these three skills bands: high, intermediate and low. The chapter concludes by arguing that the skills problem is not located only at the high-skills end of the spectrum, but also in terms of intermediate and low-skill needs. Each of these skill bands are experiencing severe human resource development problems which require resolution.

The skills deficit: a multi-pronged approach

The notion of a ‘skills crisis’ facing South Africa, especially in the professional categories, is one of the greatest challenges facing government’s attempts at developing human resources in South Africa. However, the notion of a ‘crisis’ only in high skills may be exaggerated and misplaced, and requires further interrogation.

The concept of a national economy is often read in simplistic terms as a single, monolithic entity alongside which other social structures interact. Such a monolithic view masks several processes of economic differentiation and segmentation. The model to be developed here views the economy as multi-layered. It is argued that there are three skill bands associated with three differentiated economic sectors that are structurally separated by their varying

production regimes, technology needs, product markets and skills utilisation. These skill bands arise as a consequence of economic segmentation and can be referred to as the high, intermediate and low-skill bands.

This approach attempts to overcome a severe flaw in much of the national and international literature on economic change that tends to over-emphasise the pervasiveness of the transition to high-skills, high-productivity manufacturing and services provision, at the expense of the intermediate, and low-skills sectors of the economy. The chapter develops a theoretical motivation for viewing the economy in terms of the three distinct skill bands: high, intermediate and low skills. The analysis then examines the actual skills deficit in South Africa in each of these three bands. The concluding section argues the case for 'joined-up' state action across several government departments as a means of resolving these skills problems.

Rethinking the skills crisis

The new high performance production systems and their associated high-skills regimes are often portrayed in the globalisation literature as widely distributed, ever-present and all pervasive. However, the reality in most national economies – both the advanced and developing economies – is a more discontinuous process of change with forms of productive and social organisation continuing from the past into the present alongside the leading networks of innovation. Fordist, mass-producing manufacturing, low-skill labour-intensive production, and economic activity based on familial labour – to cite three examples – continue alongside the new high-technology networked economy in both the advanced societies as well as in the developing world. The diffusion of the new high-skill production techniques is more uneven than acknowledged in the literature. They do not totally displace old forms of social and economic organisation, but rather co-exist alongside them to become the new commanding heights of most advanced national economies.

The reality of high-skills production is that it actually only occurs in relatively few sectors in the advanced and leading East Asian developing economies: information technology; biotechnology; new materials beneficiation; pharmaceuticals; aircraft manufacture; machine tools; the high-skills end of financial and business services; and the high-skills professions in the civil service, law and medicine.

Continued significance of the 'old' economy

Castells, the pre-eminent theorist of the new economy, argues that it is only the core activities of national economies that are globalised. He lists these activities as being financial markets; the information and communications sector; international trade, particularly high value-added exports and the activities of multinational corporations; and lastly, the internationalisation of science and technology and human capital formation (Castells 1996). Castells also describes those who are excluded from these global networks as 'the disconnected' – the structurally irrelevant – who reside in the third and fourth worlds and in the pockets of poverty in the advanced economies as well.

However, these core and periphery components do not constitute the total society. In between is surely middle society, which is not accounted for in many of the explanations of globalisation although it probably constitutes the majority. For countries such as South Africa, the stability and expansion of middle society is a key political goal. The bulk of personnel in the formal economy are from middle society, and their skills and well-being are the means necessary for a stable and well-functioning society. Middle society includes the lower strata of the civil service, salaried and unionised manual, semi-skilled and skilled workers, and all intermediate skilled personnel such as clerical and sales workers. Their jobs and security lie in an expanded manufacturing sector, in the revitalisation of the mines and farms, in the state, and in formal sector small, medium and micro enterprise (SMME) activity. Much of this economic activity and livelihood is a continuation and expansion of past economic forms. Globalisation's advance does not bring older economic and social institutions to an end.

There are clearly serious conceptual problems with the ideal-type categories of high-skills societies as defined by the globalisation discourse. What is required is a conceptual model that allows far greater unevenness and variability in terms of the skills needs required by a country's specific development trajectory, particularly those countries located in the developing world. These needs are unlikely to be only in the high-skills categories.

It is proposed that this can be done by adopting a mixed (or hybrid) typology of production regimes that aims to move beyond the methodological limitations described above. It does so by capturing the co-existence of multiple production processes more accurately. There is no certainty about the

precise form of industrial change, other than to stress its contingent nature, and the likelihood of it taking on a mixed character of old and new constituent parts (Hirst & Zeitlin 1991: 6, 26).

By employing a mixed typology it can be argued that the new production techniques based on high skills often co-exist alongside older forms of industrial organisation such as batch production (reliant on artisanal skills) and mass production (reliant on the mass provision of operative and intermediate skills). The new high-performance production techniques and their associated high-skills requirements are, therefore, never totalising expressions of national economic need. Rather, they reflect the demands only of those strategic subsectors, which have undergone change towards the new high-skills, high-performance production regimes. The transition to a new mode of regulation is therefore uneven and the dominance of a particular industrial paradigm is never total.

The extent of differentiated skill requirements in the South African economy is clearly demonstrated by Pillay (2003) who provides an analysis of the skill needs of nine key economic sectors. Table 12 provides an illustration of some of this variability in five key sectors: financial and business services, energy, manufacturing, forestry and tourism.

Table 12 Five economic sectors categorised in terms of skill dependency, 2002

Sectors	Dependent on a high proportion of high skills	Dependent on a high proportion of intermediate skills	Dependent on a high proportion of low skills
Financial and business services	This sector has experienced high growth rates of four per cent per annum. It is highly dependent on skilled and highly-skilled labour and has been shedding jobs in the semi-skilled and unskilled categories over the past decade.		



Energy	Historical trends continue in this sector as it shifts further towards more capital and skills-intensive forms of production, with significant job shedding at the intermediate and low-skill ends of the spectrum. The demands of nuclear energy, renewable energy and new gas resources as well as the increased use of IT in the sector all require more skilled and highly-skilled labour inputs.	It is estimated that there are over 6 500 electrical subcontractors in the sector, and this should grow as Eskom continues to subcontract to smaller black-controlled electrical companies to assist in the roll-out of its electrification programme. This will require significant inputs of skilled/artisanal labour. In addition, a large number of semi- and unskilled employees are still required in the sector.
Manufacturing	Exports are increasing and the trend towards greater capital and skills intensity is strongest in manufacturing. Significant job losses have occurred at the intermediate and low-skill categories.	Despite the job losses, manufacturing is still highly dependent on intermediate level/artisanal as well as unskilled manual labour.
Forestry	Small growth in the sector and volatile employment patterns.	Dynamism in the sector may emerge from increased exports and developments in the micro grower subsector (an estimated 18 000 new small growers are projected) which may lead to an increase in employment of between 80 000 to 100 000 unskilled and semi-skilled workers.
Tourism		Employment in tourism has increased, although estimates vary depending on definitions of the sector. The growth is largely labour-intensive, low-skilled employment, with increases in part-time and casual labour.

Source: Pillay 2003

The shaded blocks in Table 12 highlight the areas of greatest skills need in each of the five economic sectors examined. It is evident that some sectors are largely dependent on high skills (for example, the financial and business services sector), whilst others have the potential for growth in low-skills employment (tourism). However, other sectors have dual requirements, with shifts to greater capital and skills dependency occurring alongside ongoing requirements for intermediate skilling (manufacturing and energy). Forestry shows the possibility of increasing employment in the intermediate and low-skill categories. This variability strengthens the case for a multi-pronged approach to skills development in South Africa.

A shortage of high-skills

The analysis now returns to the question of high-skill shortages, viewing it as only one component of a much larger and multi-layered problematic regarding skills development in South Africa. There is no doubt that the continual expansion of high skills in South African society is a key socio-economic and political imperative. Firstly, South Africa's new democracy requires educated citizens to occupy and maintain the key democratic institutions and to participate in their civic processes. A growing economy, too, will benefit from such a society's democratic institutions. Secondly, as Brown et al. (2001) and Streeck (1992) make clear, the new economy requires broad multi-functional capabilities in excess of current demand. Streeck's argument for 'redundant capacity' and Brown et al.'s notion of 'over-training' both flag a key requirement of modern economies: the ability to innovate continuously and to adapt to rapid change in the global economy. This is only acquired on the basis of good secondary and tertiary education. The logic of moving up the value chain in South Africa implies an ever-increasing education and science base upon which greater export competitiveness can be secured for high-quality South African products. And, lastly, expanding high skills is critical because of the setbacks experienced under apartheid. The overall participation rate in South African higher education is only 16 per cent of the appropriate age cohort whereas far higher participation rates are attained in the developed and East Asian economies (NCHE 1996).

Notwithstanding the above arguments, the data show that South Africa is not undergoing a 'skills crisis' with a severe shortage of high skills in key profes-

sions in the current period. The analysis that follows suggests that this is largely due to the low economic growth and muted demand conditions in South Africa over the past decade.

The HSRC has developed an updated version of its 1999 forecasting model of labour market trends (see Whiteford, Van Zyl, Simkins & Hall 1999). In the updated version, Woolard, Kneebone and Lee (2003) develop a labour demand model to estimate the number of new positions that will arise as a result of industrial growth in the period 2001 to 2006. The model uses the ABSA sectoral growth rates as a key input. The ABSA data show that the sectors expected to grow the fastest are transport and communication, finance, insurance and business services. Given these annual sectoral growth trends, Woolard et al. (2003) determine the number of new and replacement personnel needed in the five-year period across eight select occupational categories as presented in Table 13.

Table 13 Number of workers needed to meet new and replacement demand in selected occupations, 2001–2006

Occupations	Total number of professionals employed in 2001	Number of professionals required to meet new and replacement demand over five years	Number of professionals required to meet new and replacement demand per year	Annual shortages rate as a percentage of the total number of professionals employed
Academics	37 237	6 651	1 330	3.6
Doctors	34 370	5 207	1 041	3.0
Nurses	155 516	35 461	7 092	4.6
Computer-related professionals	75 841	15 600	3 120	4.1
Teachers	354 469	73 077	14 615	4.1
Engineers	29 824	5 116	1 023	3.4
Engineering technologists	32 132	5 973	1 195	3.7
Managers	280 298	45 130	9 026	3.2

Source: Woolard et al. 2003

The numbers in Table 13 do not constitute a skills crisis. The shortages in key professions range between three and four per cent of the existing workforce in those professions. The shortages are driven largely by replacement demand and low projections of new jobs needed, given South Africa's low economic growth trajectory.

Another way of measuring the scale of the current level of high skills shortages is to compare the data in Table 13 with data from 1981 – a year in which measured vacancy rates were considered to have peaked at an all-time high and when employers were very vocal about alleged skills shortages. At this time the state measured vacancy rates through the Manpower Surveys, which today no longer exist. Even in the crisis of the early 1980s, high-skills vacancy rates across the economy were a mere 3.3 per cent of the total number of employed positions. Clearly, a peak shortages rate of 3.3 per cent in 1981 cannot be described as a 'crisis' situation (Kraak 1987: 21; NMC 1987: 19).

However, crisis conditions were experienced in particular occupations during the early 1980s. In general, occupational categories with a vacancy rate of greater than five per cent were considered to be experiencing severe skill shortages.

Table 14 provides data on the extent of shortages in particular occupational categories between the years 1977 and 1985. These can be compared with the same professions in the forecast period of 2001 to 2006 in Table 13. As can be deduced, many individual occupations experienced vacancy rates greater than five per cent, particularly in 1981. Personnel affected included engineers, scientists, technicians, medical practitioners, nurses, other paramedics, public service workers, artisans and apprentices (Kraak 1987: 21). The scale of shortages in 2001 to 2006 is moderate in comparison.

Part of the reason for relatively muted high-skill shortage projections in the period 2001 to 2006 is because demand trends are in many instances static or reflect moderate decreases, suggesting yet again a very stagnant economy over the past decade. For example, Steyn and Daniels (2003) highlight the impact of structural changes on the demand for engineers, notably the shift from mining and agriculture to the higher value-adding manufacturing and services sectors. These changes have resulted in erratic fluctuations in the demand for engineering between 1996 and 2001, with a moderate declining trend.

Table 14 Vacancy rate per occupational group, 1977–1985

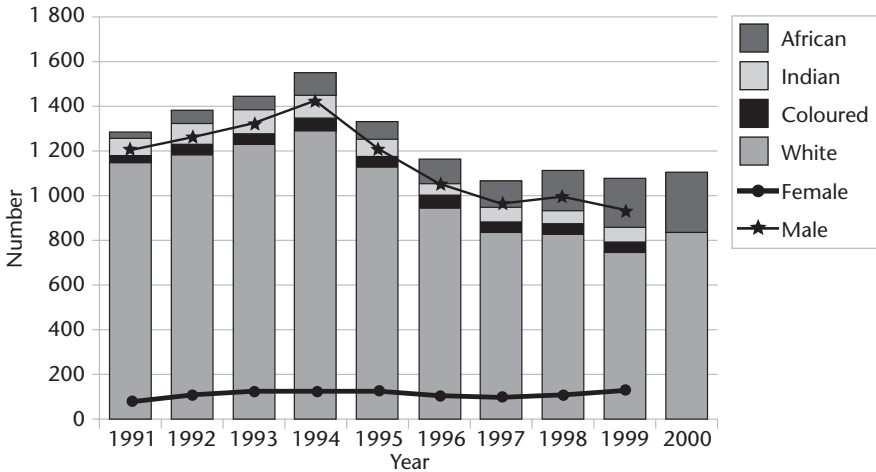
High-level professionals	1977	1979	1981	1983	1985
Educationalists	1.08	1.16	2.73	1.29	1.88
Medical doctors	6.66	5.77	6.46	6.25	4.10
Engineers	4.23	8.06	12.70	7.77	4.88
Technicians, technologists	2.72	5.24	9.94	9.06	7.94
Nurses	7.51	8.53	10.98	9.44	9.85
Scientists	6.35	9.46	13.17	8.63	8.84
Managing directors	0.01	0.05	0.09	0.16	0.15
Other managers	0.17	0.42	0.98	0.70	0.71
Total	2.62	3.68	6.03	4.81	4.61

Sources: Kraak 1987; NMC 1987: 22

This decline seems to have occurred despite an overall high-skills bias in employment trends, and an increase in the employment of managers and professionals. This trend can be partly explained by the impact of large policy changes such as the substantial decrease in the demand for engineers from the public sector-driven arms industry, the cyclical nature of private sector demand, and a reduction in local private sector R&D as South Africa is integrated into the global economy (Steyn & Daniels 2003).

This partial decline in the demand for engineers is mirrored in the decline in the training of engineers on the supply side. The output of engineering graduates at universities has declined significantly since the mid-1990s, as is illustrated in Figure 6. Figures 8 and 9 illustrate the decline in national diploma, higher diploma and BTech engineering graduates at technikons.

These supply-side declines, particularly in the technikon sector and amongst whites, are dramatic and threaten future economic growth prospects. However the same cannot be said of the new bioeconomy in South Africa, which is very small and highly dependent on expertise in new areas such as genomics, bioinformatics, proteomics and metabolomics. Walwyn (2003) compares demand in the new bioeconomy with supply. On the demand side, the mature biotech industries (in food and beverages) have remained stagnant or even decreased in terms of employee numbers, despite some growth over the last three to five years in terms of manufacturing output. As a result,

Figure 6 University graduates with engineering bachelor's degrees, 1991–2000

Source: Steyn & Daniels 2003

employment prospects for new entrants to the job market over the last ten years have been poor.

Walwyn estimates the total number of employed biotechnology graduates and technicians to be between 2 600 and 3 000. He calculates that the requirement for new entrants each year will be about 14 per cent of the existing complement of staff, which is equivalent to an estimated demand of 355 graduates and diplomates annually. This number is smaller than the annual supply (about 1 000 graduates and 200 technicians) by several factors and indicates generally an oversupply situation for graduates and technicians at the level of BSc and national diploma respectively (Walwyn 2003).

Walwyn's study reveals that the present employment levels for biotechnologists are static, within both the new bioeconomy industries and the mature industries, due to an overall decline of employment levels within manufacturing and hence rising levels of productivity. Moreover the bioeconomy is still small and not a significant employer of new graduates or diplomates. The demand situation is particularly acute at the levels of national diploma, B'Tech, BSc and BSc Honours (all in the biological sciences), where the market is more than 50 per cent over-supplied and many job market entrants are unable to find suitable employment.

Skill shortages in these two critical sectors, and perhaps more generally, are clearly muted given the stagnant and low-growth economic conditions that have characterised South Africa over the past decade.

The analysis above presents a rather static picture with a stagnant economy as the causal backdrop. However, a high-skills crisis will arise if these dormant economic conditions change, that is, if exports strategies succeed and local demand grows significantly. In this dynamic scenario, the low output of graduates on the supply side will place a major brake on rapid economic recovery. South African higher education institutions need to be positioning for a future where high-skills outputs are in excess of current needs. Supply-side provision at the high end of the skills spectrum should facilitate rather than constrain future economic growth.

The importance of intermediate skills

The analysis now moves to problems impacting on intermediate skilling in South Africa. Intermediate skills are those located in the middle education and training band that include all post-junior secondary school certificates and their equivalents but which exclude degree-level qualifications in higher education. Table 15 illustrates the current position of intermediate qualifications on the National Qualifications Framework (NQF).

Table 15 Intermediate skill levels on the National Qualifications Framework

NQF level	Skill band
1	Low skill (Pre-matriculation)
2	
3	
4	Intermediate skill (Equivalent to matriculation and matric plus diploma)
5	
6	High skill (Equivalent to higher education degrees and post-graduate courses)
7	
8	

The analysis which follows focuses on the supply and demand of intermediate skills in the South African economy. Data used here are extracted from Chapters 2 to 27 of the HSRC's *HRD Review 2003* and not from a comprehensive survey of intermediate skilling.

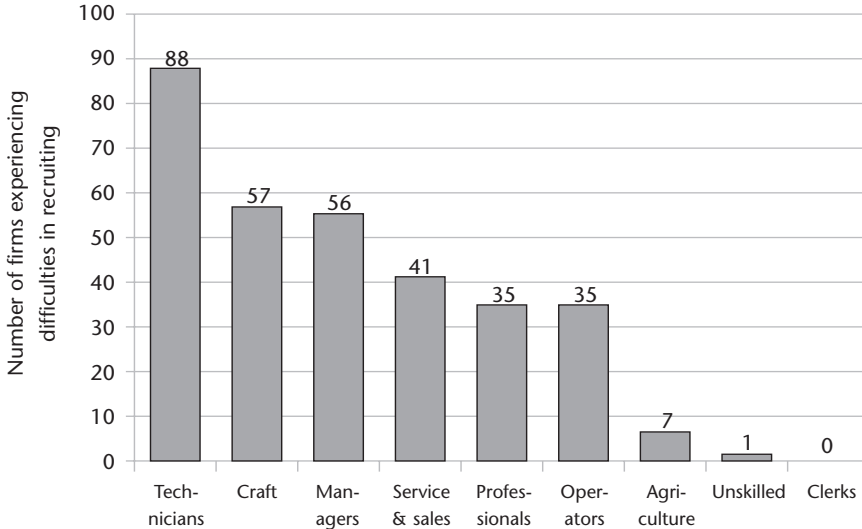
Demand for intermediate skills

The most important structural shift in the South African economy and labour market over the past three decades of late apartheid reform and post-apartheid reconstruction has undoubtedly been the rise of the African semi-skilled and skilled workforce as the dominant stratum of the working class. Prior to the early 1980s, Africans were confined largely to the secondary labour market and inferior educational institutions. By 1994, this scenario had been dramatically transformed with Africans displacing whites in most semi-skilled operative and skilled production occupations. Key contributing factors included the need for economic modernisation (in particular, the need to upskill the African working class), the collapse of influx control and the intensification of political struggle in education and the workplace (Kraak 1995).

The emergence of a 'core' African working class has been consolidated by South Africa's shift to political democracy and integration into the global economy since 1994. Two ingredients have been particularly important in this process. The first has to do with the introduction of progressive labour relations legislation protecting the employment rights of workers. This has given workers some protection in the external labour market and some of the benefits associated with secure forms of employment in internal labour markets. Secondly, the role of intermediate skilling has been a critical prerequisite for the upliftment of the African working class from unskilled manual workers to semi-skilled and skilled production workers. Intermediate skilling has played a central role in this process of post-apartheid deracialisation and modernisation of the labour market and economy.

More recent shifts in the occupational structure have not displaced the prominence of intermediate level occupations. For example, an HSRC survey into enterprise training undertaken in 2000 (Kraak, Paterson, Visser & Tustin 2000) showed that the greatest shortages of skill and the highest levels of difficulty in recruiting staff were experienced amongst 'technical' and 'craft' personnel.

Figure 7 Occupational areas in which difficulties are experienced in recruiting qualified personnel, 2000



Source: Kraak et al. 2000

Even though structural changes have occurred in the economy towards greater capital and skills-intensity (McCord & Borat 2003), Figure 7 suggests that the demand for sufficient numbers of technically competent operatives, artisans and technicians has not subsided. A recent study by SASOL across a range of industrial sectors highlighted the rapid depletion of artisans such as electricians, welders, plumbers and fitter and turners. SASOL estimates the skills shortage at up to 20 000 artisans (*Business Day* 4 July 2003).

Other occupations on the demand side that are analysed in the HSRC's *HRD Review 2003* and that suggest high dependence on intermediate skills include:

- **ICT:** The South African Information Technology Industry Strategy has estimated that only ten per cent of skilled personnel in the ICT sector hold a higher education degree. The remaining 90 per cent of qualifications in the ICT sector are provided by technikons (44 per cent diplomas) and other public and private providers (for the remaining 46 per cent of other qualifications). Other surveys suggest that this non-degree cohort is

smaller. For example, Stats SA data suggest that the non-degree component of the ICT workforce is approximately 40 per cent. This divergence in data has to do with the difficulty of gathering standardised information on the ICT sector. Nonetheless, it can be argued that the ICT sector is highly dependent on continuous education and training at intermediate (non-degree) level provided by both the public and private sectors, but increasingly the latter (Moleke, Paterson & Roodt 2003).

- **Nursing:** Nurses trained at the intermediate level play a pivotal role in the provision of public sector health care. There are three broad occupational categories according to which nurses can be classified. These are registered nurses, enrolled nurses and nursing auxiliaries. Four years of post-matric training is required for classification as a registered nurse. To qualify as an enrolled nurse, a Grade 10 certificate and two years' of college training is required. Nursing auxiliaries have a Grade 10 certificate and one year of training. The South African Nursing Council (SANC) register indicates that 49.6 per cent of all nurses in South Africa are registered nurses and 40.9 per cent enrolled and auxiliary nurses. The figures for the public health sector are 42.1 per cent and 50.7 per cent respectively. The public health system is clearly heavily dependent on enrolled and auxiliary nurses who have been trained at the intermediate skill level (Hall & Erasmus 2003).
- **The informal economy:** Contrary to popular wisdom, not all work in the informal sector is unskilled and elementary. In an occupational breakdown of workers in the informal economy, Devey, Skinner and Valodia (2003) show that 25 per cent are employed in craft-related occupations and 20 per cent are service and shop workers. A further six per cent operate in skilled agriculture. As a consequence, many writers on the informal economy argue that the important prerequisite of having had some prior work experience and intermediate skill capability acts as a major constraint on the informal economy becoming the major vehicle for resolving mass unemployment particularly amongst unskilled, inexperienced youth.

Indicators of high levels of intermediate skills provision on the supply side include:

- **Technikons and colleges:** Technikons play a crucial role in the provision of intermediate skills – specifically at the post-school, pre-degree levels. Seventy per cent of technikon graduates acquire pre-degree certificate and

diploma-level qualifications. Similarly, at public FET colleges, 45 per cent of all learners are enrolled in N4 to N6 post-school, pre-degree courses (see Fisher et al. 2003). All of these college and technikon programmes fall within the higher education band at the intermediate level.

- **Learnerships:** 47 per cent of new learnerships registered by the Department of Labour are in the intermediate band, whilst only 14 per cent are degree programmes in higher education DoL (2002b: 13).
- **Enterprise training:** Statistics on enterprise training in 2000 across all occupations show similar trends, with high levels of training in semi-skilled areas such as clerical (constituting 23.2 per cent of all workers trained), sales (14.4 per cent) and operative work (14 per cent) and amongst skilled craft personnel (11.4 per cent) (Kraak et al. 2000).

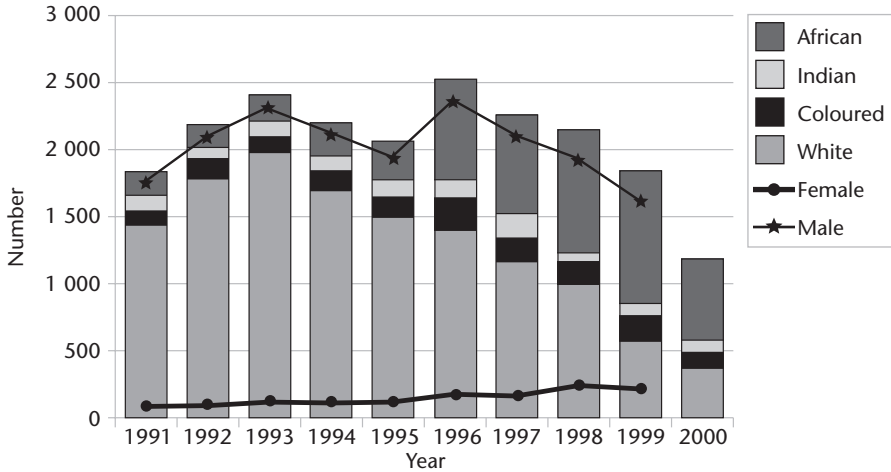
Another factor on the supply side signaling the importance of intermediate skills are the recent surges in both public and private provision at the FET-higher education interface. This is occurring largely in career and vocationally-oriented education and training at NQF Level 5 (Kraak 2002). Growth has been driven primarily by market pressure and financial need. Both public FET colleges and public higher education institutions have been forced to seek new sources of income, given government's inability to increase subsidy allocations. Increasingly, as public institutions are forced to become more responsive to the demands of the market place, and as they become more entrepreneurial in behaviour (in their search for new corporate and individual customers), so they have come to replicate the behaviour of private providers. New institutional forms have emerged in the public sector with branches and satellite campuses opening up in previously neglected rural areas. Public residential institutions are also turning to satellite and web-based broadcasting, along with other distance education technologies, with the aim of reaching an ever-growing number of new students. The private providers have grown in similar ways (Kraak 2002). They have both targeted new provision at NQF Level 5 (Akoosje 2003; Badroodien 2003; Subotzky 2003b).

Problems facing the intermediate skills sector

Although technikon enrolments have grown significantly over the past two decades (from 57 000 headcount enrolments in 1988 to 203 000 in 2000), and although technikons were established to consolidate supply-side provision of technical capability at the technician level, actual enrolment and graduate

throughput in engineering fields has been declining. The data in Figures 8 and 9 show the number of national diploma, higher diploma and BTech graduates in engineering between 1991 and 2000. Overall the figures show a substantial decline since the mid-1990s.

Figure 8 Technikon graduates with engineering national diplomas, 1991–2000

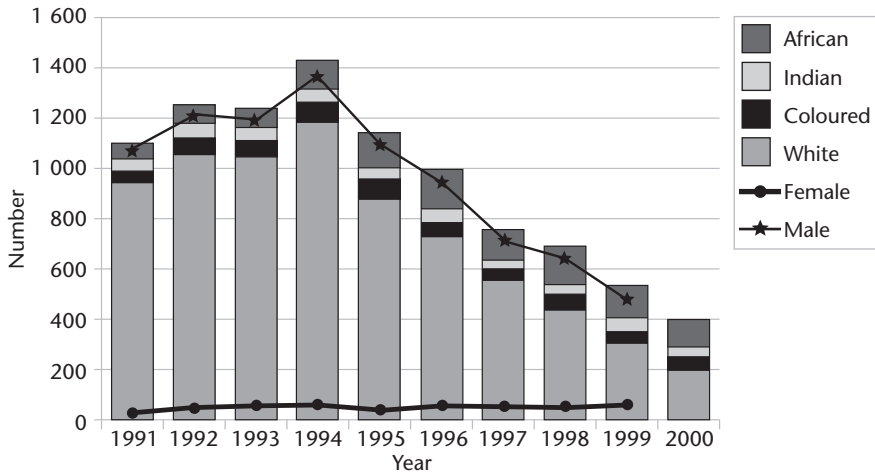


Source: Steyn & Daniels 2003

Figures 8 and 9 also show that the number of whites enrolled for engineering has declined to less than a quarter of their 1991 levels by 2000, while the number of African graduates has increased more gradually over the same period.

It is ironic that institutions of technology (the technikons) are currently witnessing a dramatic decline in a key 'hard' technology field (engineering) whilst enrolments in 'softer' non-technical subjects such as business studies expand. This problem requires action and attention from government as the provision of technical programmes at this intermediate level (NQF Level 5) is central to the success of government's national skills development strategy (DoL 2001). Perhaps the newly launched 'learnership' programme will provide the necessary leverage for government to turnaround this decline of technikon-trained engineering graduates.

Figure 9 Technikon graduates with engineering higher diplomas and BTech degrees, 1991–2000



Source: Steyn & Daniels 2003

Decline of apprenticeship and enterprise training

Similar patterns of decline are evident in the apprenticeship labour market. Table 16 shows the basic data.

Table 16 The decline of apprenticeship training in the 1980s and 1990s

Type of training	1986	1988	1990	1992	1994	1996	1998
Apprentices indentured	29 826	23 416	24 448	25 785	22 015	18 546	16 577

Source: Kraak et al. 2000

The decline in apprenticeship has been part of a much larger decline in enterprise training (see Table 17).

Table 17 Enterprise training, 1986–1998

Type of training	1986	1988	1990	1992	1994	1996	1998	Percentage rate of change by training type, 1986–1998
Regional training centers	12 599	39 661	31 650	23 560	19 227	26 157	9 524	-24.4
Private training centers	259 315	259 805	251 094	211 829	–	44 746	50 354	-80.6
Training schemes where levies apply	7 149	13 680	19 686	34 608	28 209	37 753	1 267	-82.2
Training schemes (Section 48 of LRA)	9 570	4 879	17 640	13 667	10 568	1 622	–	-83.0
Total (formal sector training)	288 633	318 025	320 070	283 664	58 004	110 278	61 145	-78.8

Source: Kraak et al. 2000. The dashes in the cells above signify years where specific reportage to the Department of Labour by the private sector on training did not occur.

These declines in technikon output, apprenticeship and enterprise training precede the implementation of the government's national skills development strategy. They provide a very low base off which to build and reflect a historically evolved enterprise culture, which remains unconvinced of the merits of widespread training.

Ineffective FET colleges

An additional problem is the poor image of FET colleges, especially their lack of responsiveness to labour market requirements and their low graduate

placement rates (see Kraak & Hall 1999). Many of the students attending these colleges have already acquired Grade 12 and are required or volunteer to repeat courses equivalent to Grades 10 to 12 in the form of vocational certificates N1 to N3. Students volunteer to do this in the hope of improving their employment chances in the labour market. This trend was confirmed by an HSRC analysis of 3 503 respondents to a 2001 survey of FET college graduates. In the study, 81 per cent of students entered the college sector with a Grade 12 certificate and subsequently exited with a N3 certificate (an equivalent qualification, not a higher level qualification). In short, this constitutes a regression to a level of learning lower than their highest level of achievement (Cosser 2003).

The study also showed that employment prospects remained very low, even after attaining additional vocational qualifications to supplement those already achieved through school matriculation. Only 33.6 per cent of FET college students found employment after graduation, with 69.7 per cent of African graduates unemployed but only 24.2 per cent of white graduates unemployed. More significantly, 35 per cent of graduates were continuing with their studies at the time of the HSRC survey – 70 per cent of whom continued with technical college studies (Cosser 2003). It is unclear, however, whether improved college qualifications will lead to better chances of employment or whether this high level of continuing education is merely a strategy to avoid the inevitability of unemployment.

So whilst intermediate skills clearly play a key role in the economy, the outputs of both public sector providers operating at this level and private sector enterprise trainers appears to be insufficient to support current economic needs let alone any surge in economic activity in the future. This training gap represents a serious skills deficit. These problems are accentuated by recent reports of mismanagement and incapacity in some of the sector education and training authorities (*Pretoria News* 16 July 2003).

Low skills

McCord and Borat (2003) highlight the consequences of a low-growth, low-employment scenario for South Africa, particularly the bias towards capital and skills intensity in the export growth sectors, which has resulted in increased unemployment. As mentioned earlier, the broad rate of unemploy-

ment is 37 per cent, rising to 47.2 per cent amongst African women in the rural areas. Clearly, South Africa needs an economic growth trajectory that includes a significant low-skill, labour-intensive employment strategy. This was indeed the call made by the President, Thabo Mbeki, in his 'State of the Nation' address at the opening of Parliament on 14 February 2003:

... the government is perfectly conscious of the fact that there are many in our society who are unable to benefit directly from whatever our economy is able to offer...[It] includes people who are unskilled and those with low levels of education in general. This reflects the structural fault in our economy and society as a result of which we have a dual economy and society. The one is modern and relatively well developed. The other is characterised by underdevelopment and an entrenched crisis of poverty. We have to respond to the needs of fellow South Africans trapped in the latter society in a focused and dedicated manner to extricate them from their condition. [The] government has decided that we should launch an Expanded Public Works Programme. ... [We] will use the Expanded Public Works Programme to provide on-the-job training to the workers that will carry out this programme. We are convinced that sustained and correctly focused work in the area of human resources development, together with the varied economic interventions we have mentioned, will help the country in the effort to attend to the important challenge of unemployment. (Mbeki 2003a)

David Ashton, a leading international scholar on enterprise training and labour market dynamics developed a similar logic when he recently argued the case for a growth model in South Africa that included such a low-skill, labour-intensive employment strategy. The benefits, according to Ashton (2004), would be:

First, the low skills strategy is certainly viable as a solution to the problems of poverty and unemployment. However, in a South African context this would only operate if the remnants of the racial segmentation of the labour market were eradicated. What is crucial at the emotional level is that the previous equation of blacks with low skilled employment is destroyed. This would then permit

a low skills strategy to be seen in a positive and constructive light. Second, such a strategy would provide the material basis for building the skills and training capacity of the country, ready for the subsequent expansion of highly skilled jobs. By taking large groups out of poverty and transforming them into productive workers then the resources are being created for the necessary improvements in the skills infrastructure. Third, the use of the low skills strategy would not preclude the simultaneous growth of intermediate level and highly skilled jobs. Fourth, the use of a low skills strategy would not preclude the introduction of the most modern high performance management techniques, as is happening elsewhere. Indeed, if the experience of China is anything to go by, these techniques are already being used there to increase the sophistication of management and the efficiency of the economy. In the case of South Africa, it may be more appropriate to talk of a skills strategy which targets jobs with basic skills as an essential pre-requisite to a subsequent re-balancing of the economy in the direction of a higher proportion of intermediate and higher level skills.

Government has articulated similar views. The Department of Labour's national skills development strategy is to expand the boundaries of employment beyond the traditional confines of the formal sector, to include the informal as well as the non-governmental development sector. Government's aim across this diversity of employment contexts will be to provide unemployed people with a combination of skills development and work experience (either through skills programmes or learnerships) in order to bridge the gap for those unemployed who lack a track record of formal work experience and skills. Types of development activity cited by the Department of Labour include: securing basic services and infrastructure such as the building of houses and accessing of water, upgrading of schools and roads; community-based public works; SMME initiatives linked to local opportunities; and youth community services (DoL 2000).

Multi-faceted policy solutions

Government responses to this multitude of problems at the high, intermediate and low-skills levels will need to be multi-faceted. Firstly, a range of

initiatives are needed to expand export-oriented, high value-adding manufacturing production and services provision, particularly via the implementation of targeted industrial policies in new globally competitive 'niche' areas. Other measures would include a dramatic improvement in the country's science base (Boshoff & Mouton 2003); a reversal in the high levels of skilled emigration (Bailey 2003); and an expansion of appropriate high-skill university and technikon-trained graduates in academic fields experiencing low enrolment and high demand.

Secondly, government, employers and the wider society need to acknowledge the importance of intermediate skills. The declining output of technikons and colleges in key 'hard' technical areas such as engineering need to be addressed. Economic policies that increase the demand for and consumption of South African basic and intermediate goods and services in the local as well as regional economy need to be implemented. These new demand conditions will project growth signals to the supply-side institutions (technikons, colleges and enterprise training facilities). Levers and incentives will need to be developed by government, employer networks and education institutions to encourage supply-side education and training institutions to respond to these new labour market signals by increasing enrolments in the specified fields.

And lastly, large-scale job creation schemes triggered by widespread public sector initiatives need to be launched by government as an immediate developmental priority. Supply-side institutions such as colleges, sector education and training authorities and private sector training centres will have a massive task in providing basic skills and other developmental measures in support of such a low-skill, labour-intensive, employment-creating strategy.

Many of the above conditions – export strategies, improvements in the science base, actions which stem the brain drain, increased outputs of intermediate trained workers, increased supply-side responsiveness, large-scale job creation schemes – are not yet in place, nor are there clear plans by the state to 'join-up' these complementary initiatives. This is largely due to the fact that many of the problems addressed above – all of them issues to do with high, intermediate and low-skills shortages – are cross-sectoral by nature. Many of these problems, therefore, often fall between the cracks of separate government departments who interpret complex social problems in rather restrictive mono-functional terms and who often locate key features of such problems

outside of their departmental mandates. As was argued in Chapter 1 of this book, what is required is greater joined-up efforts by government to find multi-faceted policy solutions, which span existing departmental silos. Implementation of joined-up policies will also need to occur cross-sectorally with an established management information system underpinning and informing these co-ordination and planning efforts in the medium to long term. Only in this 'joined-up' way will the high, intermediate and low-skill gaps identified earlier be effectively addressed and eliminated.

Notes

- 1 See work of Ashton & Green (1996); Brown, Green & Lauder (2001); Crouch, Finegold & Sako (1999); Finegold (1991); Finegold & Soskice (1988).

References

- Aglietta, M (1979) *A Theory of Capitalist Regulation*, London: Verso
- Akoojee, S (2003) Private further education and training, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa* HSRC, Cape Town: HSRC Press
- Altman, M & Mayer, M (2003) Overview of industrial policy, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Ashton, D & Green, F (1996) *Education, Training and the Global Economy*, Edward Elgar: Cheltenham
- Ashton, D (2004) High skills: the concept and its application to South Africa, in *Shifting Understandings of Skill in South Africa: Overcoming the Historical Imprint of a Low Skills Regime*, (eds) A Badroodien, S McGrath, A Kraak & L Unwin, Cape Town: HSRC Press
- Badroodien, A (2003) Enterprise training, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Bailey, T (2003) Skills migration, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Bhorat, H & Leibbrandt, M (2002) Measurement of the Determinants of Unemployment in South Africa, Unpublished mimeo, Development Policy Research Unit, University of Cape Town
- Budlender, D (2003) The social and human development context, in *Human Resources Development Review 2003: Education, Employment and Skills*, HSRC, Cape Town: HSRC Press
- Boshoff, E & Mouton, J (2003) Science policy indicators, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Brown, P, Green, A & Lauder, H (2001) *High Skills: Globalisation, Competitiveness and Skill Formation*, Oxford: Oxford University Press
- Business Day* (2003) Skills crisis, 4 July

- Castells, M (1996) *The Rise of the Network Society: The Information Age: Economy, Society and Culture*, Oxford: Blackwell
- Chandra, V, Moorty, L, Rajaratnam, B & Schaefer, K (2000) *Constraints to Growth and Unemployment in South Africa. Report No. 2: Evidence from the Small, Medium and Micro Enterprise Firm Survey*, Discussion Paper, World Bank & Greater Johannesburg Metropolitan Council
- Chang, HJ (1994) *The Political Economy of Industrial Policy*, London: MacMillan Press
- Chang, HJ (1998) Evaluating the current industrial policy of South Africa, *Transformation*, 36
- Cloete, N, Fehnel, R, Gibbon, T, Maassen, P, Moja, T & Perold, H (eds) (2002) *Transformation in Higher Education: Global Pressures and Local Realities in South Africa* Lansdowne: Juta
- Cosser, MC (2003) Graduate destination survey, in *Technical College Responsiveness in South Africa*, (eds) M C Cosser, A Badroodien, S McGrath & B Maja, Cape Town: HSRC Publishers
- Crouch, C & Streeck, W (1997) Introduction: The future of capitalist diversity, in *Political Economy of Modern Capitalism* (eds) C Crouch & W Streeck, London: Sage
- Crouch, C, Finegold, D & Sako, M (1999) *Are Skills the Answer? The Political Economy of Skill Creation in Advanced Industrial Countries*, Oxford: Oxford University Press
- DoE and DoL (Departments of Education and of Labour) (2001) *Human Resource Development Strategy for South Africa: A Nation at Work for a Better Life for All*, Pretoria
- DoL (1999) *Annual Report, 1999*, Pretoria
- DoL (2000) *National Skills Development Strategy: The Context*, Draft document, November, Pretoria
- DoL (2001) *National Skills Development Strategy*, Final version, Pretoria
- DoL (2002a) *Preliminary Annual Report, 2001/2002*, Pretoria
- DoL (2002b) *National Skills Development Strategy: Implementation Report of September 2002*, Pretoria
- DoL (2002c) *National Skills Development Strategy: Synthesis Report April – June 2002*, Pretoria
- DoL (2002d) *National Skills Development Strategy: Synthesis Report 1 July – September 2002*, Pretoria
- DoL (2002e) *National Skills Fund Strategic Projects: A Summary of the NSF Strategic Projects Currently in Implementation, 2002–2005*, Pretoria

- DST (Department of Science and Technology) (2001) *The National Biotechnology Strategy*, Pretoria
- DST (2002) *South Africa's National Research and Development Strategy*, Pretoria
- DTI (Department of Trade and Industry) (2002a), *Accelerating Growth and Development: The Contribution of an Integrated Manufacturing Strategy*, Pretoria
- DTI (2002b), *A Guide to the Real Economy*, Pretoria
- Devey, R, Skinner, C & Valodia, I (2003) The informal economy, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Dore, R (2000) *Stock Market Capitalism: Welfare Capitalism – Japan and Germany versus the Anglo-Saxons*, Oxford: Oxford University Press
- Dorrington, R, Bourne, D, Bradshaw, D, Laubscher, R & Timaus, I (2001) *The Impact of HIV/Aids on Adult Mortality in South Africa*, Technical Report, Burden of Disease Research Unit and Medical Research Council, Cape Town
- Du Toit, J (2003) Independent schooling, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Finegold, D & Soskice, D (1988) The failure of training in Britain: analysis and prescription, *Oxford Review of Economic Policy*, 4 (3): 21-51
- Finegold, D (1991) Education, training and economic performance in comparative perspective, *Oxford Studies in Comparative Education*, 1: 57-68
- Fisher, G, Jaff, R, Powell, L & Hall, G (2003) *Public Further Education and Training*, Cape Town: HSRC Publishers
- Gordon, D, Weiskopf, T & Bowles, S (1983) Long swings and the non-reproductive cycle, *American Economic Review*, 73 (2)
- Hall, E & Erasmus, J (2003) Medical practitioners and nurses, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Hirst, P & Zeitlin, J (1991) Flexible specialisation versus post-fordism: theory, evidence and policy implications, *Economy and Society*, 20 (1)
- Howie, S (2001) *Mathematics and Science Performance in Grade 8 in South Africa 1998/1999*, Pretoria: HSRC
- HSRC (Human Sciences Research Council) (2003) *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, Cape Town: HSRC Press

- IIMD (International Institute for Management Development) (2001) *The World Competitiveness Yearbook 2001*, Lausanne
- Kaplan, D (1998) Migration of the professional, semi-professional and technical occupations in South Africa: past patterns, current trends and policy, in *International Scientific Migrations Today*, (eds) J Cahrum & J-B Meyer Proceedings of the international symposium held in Bogota, June 1996
- Kaplinsky, R (1990) The development of the manufacturing sector in a democratic South Africa and regional trade, unpublished paper, Institute of Development Studies, University of Sussex, Brighton
- Kaplinsky, R (1995) The New Competition and Human Resources: How Disadvantaged are Low Income LDCs?, paper presented at the Oxford International Conference on Education and Development, Oxford, September
- Kraak, A (1987) Uneven capitalist development: a case study of deskilling and reskilling in South Africa's metal industry, *Social Dynamics*, 13 (2)
- Kraak, A (1995) South Africa's segmented labour markets: skill formation and occupational mobility under apartheid, 1979-1993, *Work, Employment and Society*, 9 (4)
- Kraak, A, Paterson, A, Visser, M, Tustin, D (2000) *Baseline Survey of Industrial Training in South Africa*, Report commissioned by the European Union's 'Labour Market Skills Development Programme', Pretoria: Department of Labour
- Kraak, A (2002) The importance of intermediate skilling at the further-higher education interface, *Perspectives in Education*, 20 (4): 53-66
- Kraak, A & Hall, G (1999) *Transforming Further Education and Training in South Africa: A Case Study of Technical Colleges in KwaZulu-Natal*, Pretoria: HSRC Publishers
- Lewis, J (2001) *Reform and Opportunity: The Changing Role and Patterns of Trade in South Africa and SADC*, Africa Region Working Paper No. 14, The World Bank
- Lipietz, A (1988) Accumulation, crises and ways out, *International Journal of Political Economy*, 13 (2)
- Mabizela, M (2002) The evolution of private provision of higher education in South Africa, *Perspectives in Education*, 20 (4): 41-52
- Maurice, M, Sellier, F & Silvestre, J J (1986) *The Social Foundations of Industrial Power*, London: The MIT Press
- Mbeki, T (2003a) 'State of the Nation Address', Opening of the Houses of Parliament, Cape Town, 14 February

- Mbeki, T (2003b) 'Address of the President of South Africa on the occasion of his Budget Vote', National Assembly, Cape Town, 18 June
- McCord, A & Borhat, H (2003) Employment and labour market trends, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- McCord, A (2003) Overview of the South African economy, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Meyer, J-B, Brown, M & Kaplan, D (2000) *Assessing the South African brain drain: a statistical comparison*, Development Policy Research Unit Working Papers, No. 00/40, University of Cape Town
- Moleke, P, Paterson, A & Roodt, J (2003) ICT and associated professionals, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- NCHE (National Commission on Higher Education) (1996) *A Framework for Transformation*, Pretoria
- NMC (National Manpower Commission) (1987) *High Level and Middle Level Manpower in South Africa: Recent Developments*, Pretoria: Government Printer
- Ntsika Enterprise Promotion Agency (1999) *The State of Small Business in South Africa 1998, Report commissioned by the Department of Trade and Industry*, Pretoria
- Perry, H & Arends, F (2003) Public schooling, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Pillay, P (2003) The skills requirements of specific economic sectors, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Pretoria News* (2003) Mdladlana plans to get tough on slower SETAs, 16 July
- Pretoria News* (2003) Manuel's budget bowls them over, Business Report, Budget Special, 27 February
- Pretoria News*, (2003) South Africa's great global success story, Business Report, 19 March
- Rodgers, G, Foti, K & Lauridsen, L (1996) Labour institutions and economic development: issues and methods, in *The Institutional Approach to Labour and Development*, (eds) G Rodgers, K Foti & L Lauridsen, London: L Frank Cass

- Steyn, G & Daniels, R (2003) Engineers and technicians, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Streeck, W (1992) *Social Institutions and Economic Performance: Studies of Industrial Relations in Advanced Capitalist Economies*, London: Sage
- Subotzky, G (2003a) Public higher education, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Subotzky, G (2003b) Private higher education and training, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- UNDP (United Nations Development Programme) (2001) *Human Development Report 2001: Making New Technologies Work for Human Development*, New York: Oxford University Press
- UNDP (2002) *Human Development Report 2002. Deepening Democracy in a Fragmented World*, New York: Oxford University Press
- Vass, J (2003) The impact of HIV/AIDS, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Walwyn, D (2003) Biotechnologists, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Whiteford, A, Van Zyl, E, Simkins, C & Hall, E (1999) *SA Labour Market Trends and Future Workforce Needs 1998–2003*, Pretoria: HSRC Publishers
- Wildeman, R (2003) Public educational expenditure, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- Woolard, I, Kneebone, P & Lee, D (2003) Forecasting the demand for scarce skills, 2001–2006, in *Human Resources Development Review 2003: Education, Employment and Skills in South Africa*, HSRC, Cape Town: HSRC Press
- WEF (World Economic Forum) (2000) *The African Competitiveness Report 2000/2001*, New York: Oxford University Press