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## HRD AND THE SKILLS CRISIS

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**abstract |** This chapter presents the case for a multi-pronged approach to the so-called 'skills crisis' in South Africa. Since South Africa is a developing country, with a large proportion of its people unemployed and possessing very low levels of skill, the privileging of high skills is inappropriate as the sole focus of human resources development. Intermediate skilling is a critical and complementary input upon which current economic growth is heavily reliant. The chapter thus argues for a joint strategy to promote both high- and intermediate-level skilling.

Furthermore, a low-skill, labour-intensive employment strategy is perhaps the most important political demand facing government. What is required is an integrated and multi-pronged human resources development strategy that simultaneously supports the expansion of high-skills capacity and high-level knowledge production, re-invigorates the supply of intermediate skills to the national economy, and provides support to low-skills job creation initiatives.

## INTRODUCTION

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).<sup>1</sup> It adds to the conceptual framework introduced in Chapter 1, which argued for the importance of institutions and 'joined-up' policy. 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 human resources development. 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 this Review, the analysis then examines the actual skills deficit in South Africa in each of the three skill bands: high, intermediate and low. The chapter concludes by arguing that the skills problem is found not only at the high-skills end of the spectrum, but also in the areas of intermediate and low skills. Each of these skill bands is experiencing acute problems in human resources

development, the resolution of which depends on government achieving 'joined-up' and multi-faceted policy solutions which span existing departmental silos.

## A CRITIQUE OF THE HIGH-SKILLS THESIS

The rise of the new global economy over the past two decades has meant that the attainment of comparative advantage for individual nation states is now not forged on the backs of low-cost labour and cheap material inputs (as was the case during industrial capitalism's earlier history), but on the basis of high-quality, high value-added export-oriented manufacturing and services.

A necessary corollary to this new production regime has been the attainment of high participation rates in general education and, in particular, the development of multi-functional skill capabilities. Multi-functional skills are broad capabilities acquired in excess of current demand. They can be acquired only through high levels of general education on which appropriate forms of vocational and career-oriented training can optimally be built. According to Streeck, 'redundant capacity' – which Brown, Green and Lauder (2001) call 'over-training' – is required because of the need, under globalisation, for workers to be able to adapt to rapidly changing conditions in highly volatile markets, for example, the need to rapidly retool to meet new consumer demand (Streeck 1992: 15). Multi-functional competence is also required because of the changing nature of work organisation, particularly the flattening of hierarchies and the re-integration of head and hand. Workers must therefore have vast additional capacities to understand, if not shift into, diverse enterprise activities – production, maintenance, computer programming, product and process design, marketing and sales. As a consequence of all of these demands, skills acquisition needs to be broad and polyvalent (again, qualities derived largely from good general education), rather than narrow and functionally dedicated to any single purpose or activity.

This kind of excess capacity is difficult to build under pure market conditions. Many employers may not see the justification for investment in skills development in excess of current demand, especially in the context of high-skills shortages and employment-equity pressures, as is the case in South Africa. Many hold the view that skilled staff are more easily poached from companies that train. Therefore, excess or multi-functional capacity is only likely to be provided when employers are obliged by collective institutional and regulatory arrangements to value the benefits of a more skilled workforce.

### Moving up the value chain

A related requirement for successful economies and skills formation systems in the new global economy is the need to move the majority of productive activities up the value chain towards 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 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 the 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.

South Africa's industrial policy has had a different trajectory. Historically, South Africa, as a minerals and resource extraction economy, adopted import-substituting industrialisation policies aimed at developing a strong internal industrial base. This is in sharp contrast to the export-oriented industrialisation that occurred in the Pacific Rim countries which sought to build an industrial base with production geared to external markets, so generating economies that lower costs and foster international competitiveness.

Altman and Mayer argue in Chapter 3 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 before the early 1990s severely constrained the development of the South African manufacturing sector (see Chapter 3).

### 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, which are structurally separated by their differing 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-skills bands.

This approach attempts to overcome a severe flaw in much of the national and international literature on economic change, which 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 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-production 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 advanced societies as well as in the developing world. The diffusion of the new high-skills production techniques is more uneven than is acknowledged in the literature. These techniques 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 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 only the core activities of national economies 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 pockets of poverty in the advanced economies.

However, these core and periphery components do not constitute the total society. In between is 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 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.

The problem of ignoring middle society is related to an exaggeration of the changes impacting on manufacturing. Analyses of economic change tend to overstate the shift within manufacturing towards higher value-added production, and to over-emphasise the shift from manufacturing to services, particularly the high-skills 'information age' services. The reality is far less dramatic.

The neglect of middle society and manufacturing has a further ripple effect – the undervaluing of intermediate skills. Crouch, Finegold and Sako (1999) make the case for a more nuanced reading of the industrial change currently taking place. They establish a useful correspondence between high-, intermediate- and low-skills bands, and certain economic sectors dependent on these skill bands. This correspondence arises because certain product markets lend themselves to particular skills inputs – low, intermediate or high. The three sectoral bands, categorised according to dominant skills requirements in manufacturing, are:

- *High-skills sectors:* petrol, gas, chemicals, dyes, paints, pharmaceuticals, and office equipment;
- *Intermediate-skills sectors:* engines, machine tools, metal machine tools, and non-electric machines; and
- *Low-skills sectors:* meat, rubber, leather goods, rubber goods, textiles (Crouch et al 1999).

The significance of the above analysis is that manufacturing and intermediate skilling continue to be important to the economies of several advanced countries.

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 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, which 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 that it will take 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 only the demands of those strategic subsectors that 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.

### Applying the mixed skills model to the developing world

The push for higher skills is also applicable in the developing world, as Kaplinsky (1995) confirms, because even these less-developed countries need to build strategies of moving up the value chain towards higher value-added production. Kaplinsky argues that the path to sustainable income growth for less-developed countries is to escape from the 'immiserising' production of undifferentiated, low value-added goods that face declining terms of trade because they are subject to intense competitive pressures (Kaplinsky 1995).

Kaplinsky adds to the concept of 'hybridity' by arguing that new production techniques are seldom introduced *en bloc* in developing countries. That is, they are not introduced systemically, but rather, in piecemeal style over time, and altered by local social, cultural and economic conditions (Kaplinsky 1995).

Firms do not always follow a linear, sequential path of adoption. They often restrict changes to specific techniques without relating them more broadly to systemic change. In a number of case studies in less-developed economies, Kaplinsky shows that diffusion has taken place partially, with the introduction of key elements of higher value-adding production (such as new work organisation techniques) in the absence of other elements (for example, the high educational levels normally associated with high-skills, high-performance production systems in the developed world). However, Kaplinsky notes that as countries move toward a more complete, systemic adoption of all of these new techniques, higher levels of education are required (Kaplinsky 1995: 16).

A country such as South Africa complicates the developed/developing world typologies even further, because it does not fit easily into first- or third-world classifications, and has a sufficiently developed industrial sector, capable of diffusing several elements of the new production techniques.

Given all the above, it would be more useful to talk of a differentiated skills formation system in South Africa that, firstly, incorporates all three skill bands noted by Crouch et

al (discussed earlier), and secondly, seeks to build a development strategy around the integration and interlocking of these skill bands rather than around their potential for amplifying existing social divisions.

Conceptualising a skills development strategy for South Africa in this manner would entail targeting three complementary skills development components:

- **Expanding the high-skills enclave:** South Africa has relatively sophisticated infrastructure for transport, information technology, telecommunications, financial markets, higher education, and science and technology, all of which require and employ highly skilled personnel. In addition, since the demise of apartheid, South Africa has been relatively successful in increasing higher value-added exports, especially in the automobile sector. Other recent economic developments (such as the Blue IQ and Innovation Hub developments in Gauteng) suggest that there is clearly the demand for, and infrastructure capable of handling, higher skill, higher value-added goods and services. Although these activities are restricted to an enclave smaller than the high-end manufacturing and services sectors in advanced countries, they all need to be expanded if significant economic growth is to occur.
- **Meeting the low- to intermediate-skills demands:** The development and growth of the new high-technology enclave in manufacturing does not displace the previous manufacturing regime, which was based on mass production and jobbing (small batch) labour processes. The growth of these sectors was restricted by apartheid's exclusion from the world economy, by the racial restrictions placed on growth in internal demand, and by the stagnation that set in as a result of import-substituting manufacture. The challenge now is to renew and expand the sector within the country and in the southern African region, based on increased demand and improved intermediate skills. Given that economic development cannot wait for a new generation of well-educated school-leavers, South Africa will need to follow the Singaporean example of rapid socio-economic change, which was achieved by upskilling the existing workforce, and which Singapore succeeded in doing in only two decades (Ashton & Green 1996: 162; Brown et al 2001: 96).
- **Catering to the low-skills sector:** South Africa has a population of approximately 43 million people, 12.6 million of whom are economically active. Over eight million of the economically active people in South Africa have jobs in the formal economy and another 1.3 million are employed in the informal economy. About 3.2 million are unemployed (DoE and DoL 2001: 38). South Africa is also characterised by a very high degree of income inequality and social polarisation. The challenge, then, is threefold. First, targeted sectoral policies that create labour-absorbing employment at the low-skill end need to be aggressively pursued. Second, South Africa must pursue SMME-development strategies that incorporate the unemployed and those people participating in survivalist activities in a more stable informal sector, with stronger linkages into the formal economy. Third, public sector job creation schemes need to be initiated, which would have benefits for the economy as a whole (by kick-starting increased demand), and would employ large numbers of low-skill workers. The priority in all of these initiatives would be job creation, rather than significant

skills upgrading. Appropriate low-level skills training in operating and sustaining SMMEs, self-employment, basic literacy and numeracy, and low-level technical skills would be the most important components of such a strategy. This low-skills strategy would have a developmental rather than a pejorative association.

This typology is intended to highlight the differentiated skills needs of a country such as South Africa, where political democracy and public policy debates are founded on reducing the extreme levels of income inequality and social polarisation inherited from apartheid, and increasingly exacerbated by globalisation. Only a multi-layered skills development strategy such as the above will be able to contribute to the process of reducing poverty.

The distinction between the three skills bands is made without denying the high levels of interdependence and interaction between them. The concept also takes into account other categorisations of the national economy, for example, divisions by economic sector or firm size. These classifications add further complexity to the idea of three separate skills bands. For example, even in high-skills sectors, intermediate- and low-skills labour are also deployed, but in significantly lower proportions than would be the case in intermediate- and low-skills sectors, and vice versa. In addition, highly skilled personnel are not only concentrated in large firms (although this has been the trajectory of development in key capital- and skills-intensive sectors in the past). There are also small firms that are dependent on high skills, particularly those firms using new computer-aided technologies and/or located in the new high-tech service industries.

Dynamics in one skills band can permeate the other two skills bands and have an influence on skills formation within each band. As was suggested earlier, 'moving up the value chain' entails movement within key sectors of the economy, from niche areas of low value added and high competition to niche areas of higher value added and lower competition. Technological innovation in the high-skills sectors can have the effect of diffusing (to the intermediate- and low-skills sectors) some elements of the improved technologies – thereby acting to upskill the entire production system. Such diffusion does not occur via market forces alone, but would require concerted government encouragement and incentivisation through appropriate industrial, technology and training policies.

In Chapter 4, Pillay provides an analysis of the skills needs of nine key economic sectors of the South African economy. What is evident from his description is the high degree of variability regarding skills needs between economic sectors. Table 1 provides an illustration of this variability in five key sectors: financial and business services, energy, manufacturing, forestry and tourism.

**TABLE 1** Five economic sectors categorised in terms of skills dependency, 2000

Sector	Dependent on a high proportion of high skills	Dependent on a high proportion of intermediate skills	Dependent on a high proportion of low skills
<b>Financial and business services</b>	The sector has experienced high growth rates of 4 per cent per annum in recent years. 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.		
<b>Energy</b>	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-skills 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 input of skilled/artisanal labour. In addition, a large number of semi-skilled and unskilled employees are still required in the sector.	
<b>Manufacturing</b>	Exports are increasing and the trend towards greater capital and skills intensity is strongest in manufacturing. Significant job losses have occurred in the intermediate- and low-skills categories.	Despite the job losses, manufacturing is still highly dependent on intermediate level/artisanal and unskilled manual labour.	
<b>Forestry</b>	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 and 100 000 unskilled and semi-skilled workers.	
<b>Tourism</b>			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: Designed by author based on Pillay (Chapter 4)

The shaded blocks in Table 1 highlight the areas of greatest skills needs 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.

## HIGH-SKILLS SHORTAGES

The analysis now returns to the question of high-skills shortages, viewing it as only one component of a much larger and multi-layered problem 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. 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' in terms of a severe shortage of high skills in key professions 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.

As is outlined in Chapter 20, the Human Sciences Research Council has developed an updated version of the 1999 forecasting model of labour market trends (Whiteford et al 1999). In the updated version, Woolard, Kneebone and Lee (see Chapter 20) 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, communication, finance, insurance and business services. Given these annual sectoral growth trends, Woolard et al determine the number of new and replacement personnel needed in the five-year period across eight select occupational categories, as presented in Table 2.

**TABLE 2** Number of professionals needed to meet new and replacement demand in selected occupations, 2001-2006

Occupation	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	Rate of annual shortage 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
Educators	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 (Chapter 20)

The numbers in Table 2 do not constitute a skills crisis. The shortages in key professions range between 3 and 4 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 above 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 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 shortage 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 5 per cent were considered to be experiencing severe skills shortages. Table 3 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 2. As can be deduced, many individual occupations experienced vacancy rates greater than 5 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.

**TABLE 3** Vacancy rate per occupational group, various years, 1977-1985

	1977	1979	1981	1983	1985
<b>High-level professionals</b>					
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
<b>Total</b>	<b>2.62</b>	<b>3.68</b>	<b>6.03</b>	<b>4.81</b>	<b>4.61</b>

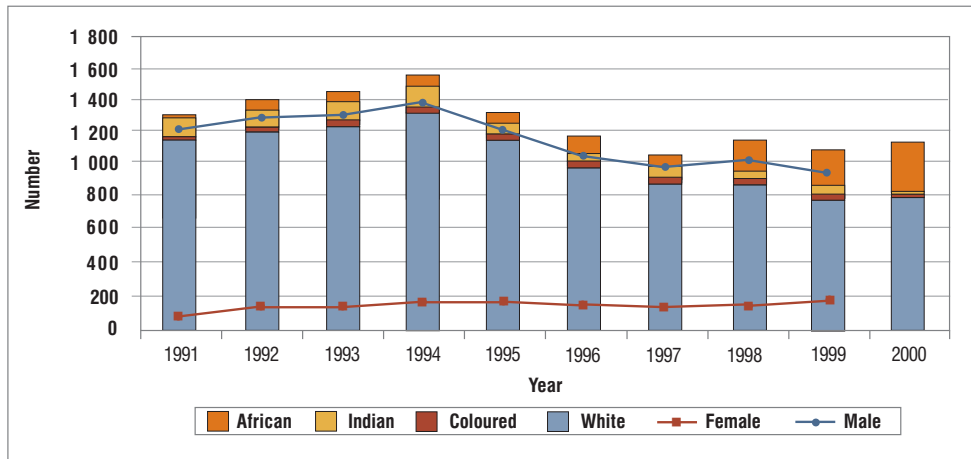
Sources: Kraak (1987); NMC (1987: 22)

Part of the reason for relatively muted high-skills shortage projections in the period 2001 to 2006 is that demand trends are, in many instances, static, or reflect moderate decreases, suggesting yet again a stagnant economy over the past decade. For example, Steyn and Daniels (see Chapter 24) 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 resulted in erratic fluctuations in the demand for engineers between 1996 and 2001, with a moderate declining trend.

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 (see Chapter 24).

The partial decline in the demand for engineers is mirrored by 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 1. Figures 3 and 4 illustrate the decline in national diploma, higher diploma and BTech engineering graduates at technikons.

FIGURE 1 University graduates with bachelor degrees in engineering, 1991-2000



Source: Steyn & Daniels (Chapter 24)

Note: Data on gender were not available for 2000.

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 (see Chapter 25) compares demand in the new bioeconomy with supply. On the demand side, the mature biotech industries (in food and beverages) have remained stagnant or decreased in terms of employee numbers, despite some growth in manufacturing output over the last three to five years. As a result, 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 staff complement, 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 levels of BSc and national diploma respectively (see Chapter 25).

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 is not yet a significant employer of new graduates or diplomates. The demand situation is particularly acute at the levels of national diploma, BTech, 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 (see Chapter 25).

Skills 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 export strategies succeed and local demand grows significantly. In this scenario, the low output of graduates on the supply side will place a major brake on rapid economic recovery. Streeck (1992) and Brown et al's (2001) arguments regarding the need for 'redundant capacity' and 'over-training' is relevant here: 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 bands. They include all post-junior secondary school certificates and their equivalents, but exclude degree-level qualifications in higher education. Table 4 illustrates the current position of intermediate qualifications on the National Qualifications Framework (NQF).

**TABLE 4** Intermediate skill levels on the National Qualifications Framework

NQF Level	Skills band
1	Low skills (Pre-matriculation)
2	
3	
4	Intermediate skills (Equivalent to matriculation, and matric plus diploma)
5	
6	High skills (Equivalent to higher education degrees and postgraduate courses)
7	
8	

Source: Author

The analysis that 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 in this Review 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 include 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.

The advance of the mechanised technologies and mass production techniques characteristic of this period (1960s to 1980s) brought with it demands for new forms of labour power. There was a strong demand for large numbers of cheap, semi-skilled workers, which the existing system of labour reproduction was unable to meet. This necessitated the reconstitution of the racial division of labour and racially segmented labour markets, so as to allow for the production of a greater number of African semi-skilled workers (Kraak 1987: 27; Webster 1985: 369). The period since the early 1980s has witnessed a great number of changes aimed at meeting these new labour requirements.

Hindson has traced many of these important developments. The most significant has been the rapid movement of African workers from unskilled secondary labour market jobs to semi-skilled operative positions in the subordinate primary labour market. Hindson observes that by 1990, these workers had exceeded two million, and had 'superseded the unskilled African proletariat as the numerically dominant stratum of the African working class' (Hindson 1991: 230). Table 5 highlights the key characteristics of South Africa's labour market after this process of resegmentation.

Table 5 also reflects the high degree of differentiation that occurred within the African working class (Hindson 1991: 239). Urban semi-skilled African workers were increasingly benefiting from forms of secure labour employment associated with internal labour markets. By the late 1980s, South African semi-skilled workers had acquired greater access to promotion and education and training opportunities, were well-paid in comparison with secondary workers, and had access to housing and a relatively developed urban social infrastructure. The restructuring of employment conditions of the 'core' labour force in the cities and towns has therefore occurred largely at the expense of vast numbers of black people located in the collapsed rural economy, and those facing permanent unemployment in informal settlements outside towns and cities. This body of excluded and permanently unemployed labour has come to constitute the 'peripheral' labour force (Hindson 1991: 239).

**TABLE 5** The de-racialisation and resegmentation of the South African labour market, early 1990s

Variable	Independent primary labour market	Subordinate primary labour market	Secondary labour market
<b>Job</b>	Professional, semi-professional and skilled jobs	Union-organised, secure; skilled and operative jobs	Unskilled, insecure and non-unionised jobs
<b>Race</b>	Mostly middle-class whites plus a small emergent black middle-class managerial layer	Mostly black operative workers who are Cosatu members; some poor white workers	Mostly unskilled black workers
<b>Gender</b>	Mostly men; a minority of high-level positions occupied by white women	Mostly men; a small number of unionised black female operative workers	The large majority of township and rural African women find themselves in the secondary labour market and informal economy

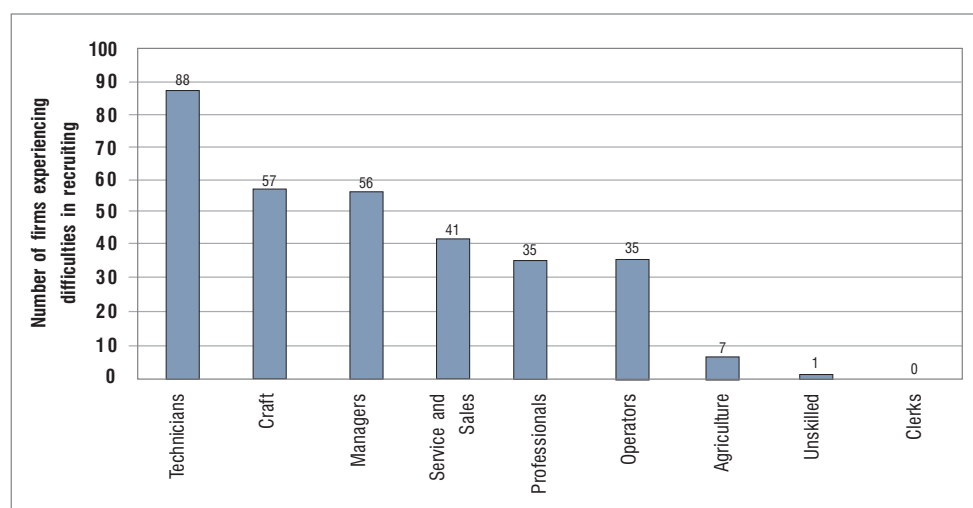
Source: Kraak (1995)

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 to protect 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 de-racialisation and the 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, a Human Sciences Research Council survey into enterprise training, undertaken in 2000 (Kraak, Paterson, Visser & Tustin 2000), showed that the greatest shortage of skills and the highest levels of difficulty in recruiting staff were experienced amongst 'technical' and 'craft' personnel.

**FIGURE 2** Occupational areas in which difficulties are experienced in recruiting qualified personnel, 2000



Source: Kraak et al (2000)

Even though structural changes towards greater capital- and skills-intensity have occurred in the economy (as argued by McCord and Borat in Chapter 5), Figure 2 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 fitters and turners. SASOL estimates the skills shortage to be up to 20 000 artisans (*Business Day* 2003).

Other occupations on the demand side that are analysed in this Review, and that suggest high dependence on intermediate skills include:

- **ICT:** The South African Information Technology Industry Strategy has estimated that only 10 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 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 (see Moleke, Paterson & Roodt, Chapter 27).

- **Nursing:** Nurses trained at the intermediate level play a pivotal role in the provision of public sector healthcare. 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 are 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-skills level (see Hall & Erasmus, Chapter 23).
- **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 (see Chapter 6) show that 25 per cent of workers are employed in craft-related occupations, and 20 per cent are service and shop workers. A further 6 per cent operate in skilled agriculture. As a consequence, many writers on the informal economy argue that the important pre-requisite of having some prior work experience and intermediate skill capability acts as a major constraint to 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, Jaff, Powell & Hall, Chapter 14). All of these college and technikon programmes fall within the higher education band at the intermediate level.
- **Learnerships:** Table 6 indicates that, at the training end of FET provision, 47 per cent of new learnerships registered by the Department of Labour are in the intermediate band, while only 14 per cent are degree programmes in higher education.

**TABLE 6** Number and percentage of registered learnership programmes by NQF level, March 2002

NQF Level	Number of registered learnership programmes	Percentage of registered learnership programmes	Skills band
1	7	3	Low skills (Pre-matriculation)
2	37	14	
3	58	22	
4	79	30	Intermediate skills (Equivalent to matriculation and matric plus diploma)
5	46	17	
6	28	11	High skills (Equivalent to higher education degrees and postgraduate courses)
7	7	3	
8	0	0	

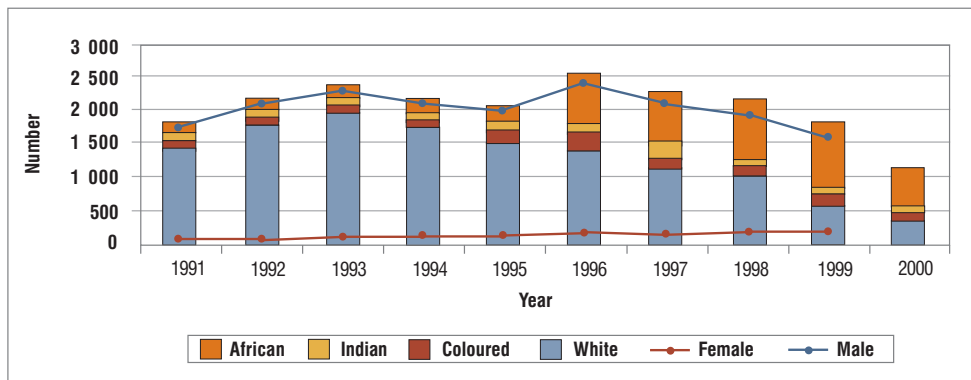
Source: DoL (2002d:13)

- **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 that signals the importance of intermediate skills is the recent surge in both public and private provision at the FET-higher education interface. This is occurring largely in vocationally and career-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 marketplace, and as they become more entrepreneurial in their behaviour (by seeking 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), having targeted new provision at NQF Level 5 (see Akoojee, Chapter 17; Subotzky, Chapter 18; and Badroodien, Chapter 19).

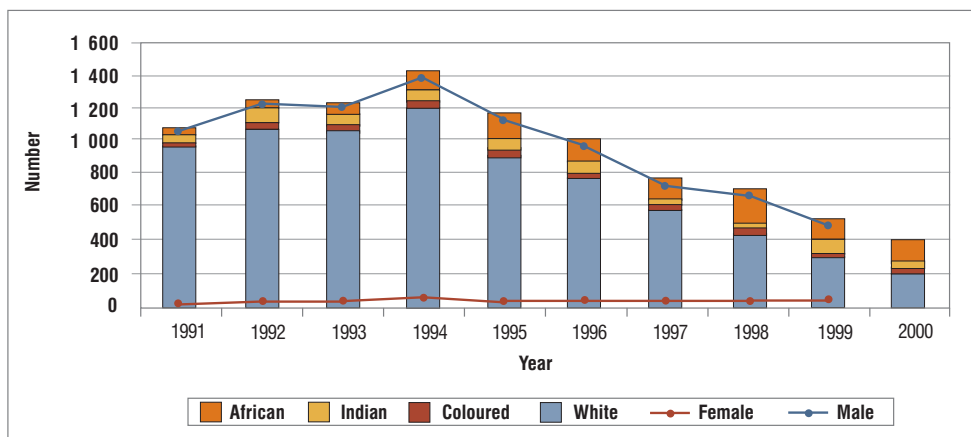
### Problems facing the intermediate-skills sector

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 have been declining. The data in Figures 3 and 4 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 3** Technikon graduates with national diplomas in engineering, 1991-2000

Source: Steyn &amp; Daniels (Chapter 24)

Note: Data on gender were not available for 2000.

**FIGURE 4** Technikon graduates with higher diplomas and BTech degrees in engineering, 1991-2000

Source: Steyn &amp; Daniels (Chapter 24)

Note: Data on gender were not available for 2000.

Figures 3 and 4 also show that the number of white engineering graduates declined to less than a quarter of their 1991 levels by 2000, while the number of black graduates 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), while graduations 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 turn around this decline in technikon-trained engineering graduates.

## Decline in apprenticeship and enterprise training

Similar patterns of decline are evident in the apprenticeship labour market. Table 7 shows the basic data.

**TABLE 7** The decline in 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 8).

**TABLE 8** 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 centres	12 599	39 661	31 650	23 560	19 227	26 157	9 524	-24.4
Private training centres	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
<b>Total (formal sector training)</b>	<b>288 633</b>	<b>318 025</b>	<b>320 070</b>	<b>283 664</b>	<b>58 004</b>	<b>110 278</b>	<b>61 145</b>	<b>-78.8</b>

Source: Kraak et al (2000)

Note: The dashes in the table signify years where specific reportage to the Department of Labour by the private sector on training did not occur.

The decline in technician output, apprenticeship and enterprise training has preceded the implementation of the government's National Skills Development Strategy. They provide a very low base to build off, and reflect a historically evolved enterprise culture that 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 but 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 a Human Sciences Research Council analysis of 3 503 respondents in 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 an 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 students attained 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.

### Potential turnaround in intermediate-skills training

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 with people already employed, and 4 682 with new entrants into the labour market (DoL 2002a: 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, and the total number reaches 34 389 learners in structured training – a 107 per cent increase 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 increase in learnership registrations since April 2001 is impressive, the aggregate numbers are still low in comparison with the size of both the youth labour market, and the more generalised problem of unemployment.

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 this 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 was out of a total workforce of 9.3 million people (DoL 2002b: 9). These data suggest that roughly 10.7 per cent of the total workforce received some form of structured training in the 2001/02 financial year – 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 2002b: 9), suggesting that the training rate is increasing significantly.

In addition, the 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 people in 1998, representing a training rate of below 3 per cent of the total workforce (Kraak et al 2000). However, the apartheid era data reflect only officially reported data, signifying a massive undercount of unreported training. The NSDS data are more likely to report realistic levels of training via sector education and training authority information systems.

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.

So, while intermediate skills clearly play a key role in the economy, the outputs of public sector providers operating at this level and that of private sector enterprise trainers appear to be insufficient to support current economic needs, let alone a 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* 2003).

## LOW SKILLS

In Chapter 5, McCord and Bhorat highlight the consequences of a low-growth, low-employment scenario for South Africa. They draw particular attention to 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 unemployment is 37 per cent, rising to 47.2 per cent among 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:

... 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 2003).

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, which included such a low-skills, labour-intensive employment

strategy. According to Ashton (2003):

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, 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 (Ashton 2003).

Government has articulated similar views. The Department of Labour's National Skills Development Strategy is intended 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. Across this diversity of employment contexts, government's aim is 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 who lack formal work experience and skills. The 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

The multitude of problems at the high-, intermediate- and low-skills levels requires a multi-faceted response from government. First, a range of initiatives is needed to expand export-oriented, high value-adding manufacturing production and services, 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, Chapter 9); a reversal in the high levels of skilled emigration (Bailey, Chapter 10); and an expansion of appropriate high-skills university and technikon-trained graduates in academic fields currently experiencing low enrolment and high demand.

Second, 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 must 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 the regional economy, need to be implemented. The resulting demand conditions will project growth signals to the supply-side institutions (technikons, colleges and enterprise training facilities). At the same time, levers and incentives will be required from government, employer networks, and education institutions, to encourage supply-side education and training institutions to respond to the new labour market signals by increasing enrolments in the specified fields.

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-skills, 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 cited above – all of them issues to do with high-, intermediate- and low-skills shortages – are cross-sectoral by nature. Consequently, many of these problems often fall between the cracks of separate government departments that interpret complex social problems in rather restrictive mono-functional terms, often locating key features of such problems outside of their departmental mandates.

As was argued in Chapter 1, greater 'joined-up' efforts by government are required 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 through a 'joined-up' approach will the high-, intermediate- and low-skills gaps identified earlier be effectively addressed and eliminated.

## Biography

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## Note

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

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