

Skills Shortages in South Africa: A Literature Review

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Abstract

This paper conducts a review of the literature on skills shortages in South Africa. It is demonstrated that different Government departments have different views concerning the definition of skills shortages. This is largely due to the omission in any official government literature of tying the concept of “skills shortages” to productivity. There is also a complex and frequently overlapping institutional architecture that undermines the effective administration of skills development. An important example of this is that the link between providing skills training and accrediting individuals with a qualification that acknowledges this training is very poorly administered, highlighting poor co-ordination between the Department of Labour and Department of Education. Among Sectoral Education and Training Authorities (SETAs), there is also under-performance on their mandate to provide skills training for the unemployed – an activity that is flagged in this review simply because of the strong public good nature to this activity and the fact that only SETAs are institutionally empowered to effect this change. A variety of policy recommendations are made with respect to both closed- and open-economy solutions to skills shortages. A key point is that immigration legislation must be relaxed in order to help solve the pervasive skills constraints in South Africa.

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Table of Contents

1.	Introduction.....	1
2.	The Post-1994 Policy Environment.....	4
2.1	Performance of Government Skills Oriented Institutions.....	7
3.	Demand for Human Resources.....	12
3.1	The National Enterprise Survey (1998) and World Bank Surveys (1999).....	12
3.2	The Human Sciences Research Council (HSRC) Report in 2003.....	14
3.3	Surveys and Skills Assessments in 2005 and 2006.....	17
4.	Supply-Side Concerns.....	21
4.1	Enterprise Training.....	21
4.2	The Education System and Education Providers.....	23
4.2.1	<i>Learner Choices Post Secondary School</i>	<i>23</i>
4.2.2	<i>Higher Education.....</i>	<i>25</i>
4.2.3	<i>Private Education Provision.....</i>	<i>26</i>
5.	Intermediating Between Demand and Supply: The Broader Institutional Context.....	29
6.	Discussion.....	32
7.	Policy Recommendations.....	33
8.	References.....	36
9.	Appendices.....	41
	Appendix 1: Managerial Competency Groupings in DYNA Training Survey.....	41
	Appendix 2: Scarce Skills by Main and Minor Occupational Categories, DOL: 2004-2009.....	42
	Appendix 3: List of "Scarce and Critical" Skills Published by DHA, and Number of Individuals Required in Each Occupation.....	43

1. Introduction

This paper reviews the literature on skills shortages in South Africa. 'Skills shortages' is an amorphous concept that encapsulates many specific components, but at the heart of the matter is the idea that the demand for certain skills exceeds supply. In the discourse of labour economics, labour supply refers to the individuals who participate in the labour market with given endowments of human capital, whereas labour demand refers to the private and public entities that employ individuals. Intermediating between these is the set of institutional arrangements that help form and shape the nexus between labour demand and supply, including educational institutions in civil society, training providers in the private sector and the public sector. The focus of this paper is therefore directed to these three concepts and their interrelationships.

The genesis of South Africa's skills policy regime is intricately linked to our history as an Apartheid state, the legacy this presented in the labour market, and the efforts post-1994 to ameliorate the iniquities of "*Bantu*" education. At the same time, South Africa's highly isolationist geo-political and economic policies were substantively transformed in the democratic era, forcing firms to become more competitive and export oriented. This often had the effect of augmenting capital-intensive technological change, and otherwise inducing a thorough reorganisation of the forms and methods of production, with its resultant skills implications. Inevitably, this process was not without its losers, but several years on – as we undertake this evaluation in 2006 – the economy has witnessed the longest sustained upswing in the business cycle for many decades. The ability to continue this upswing is dependent on many things, an important component of which is the increasing efficacy of the skills development regime.

With this as our context, it is important to define skills shortages and the components thereof. We note that there is traditionally a difference in the way that economists think of skills shortages and the manner in which the state has come to define it. For economists, the most important aspect of any discussion of skills is its relationship to productivity in the firm. However, Government has defined skills shortages without taking this relationship into account. Shortages are defined in both absolute and relative terms, but neither of these concepts is related to productivity. This results in disputes between Government departments (e.g. Department of Labour, Department of Home Affairs, etc.) over the precise numbers of occupational skills shortages. Having noted this, in this document we proceed to discuss the latter concept of skills shortages predominantly, since the domestic literature is almost exclusively focussed (implicitly) on this interpretation of the concept.

Given this definition of skills shortages, it is important to clarify the components of the problem as presented in the Government literature. Firstly, skills are understood to refer to both qualifications and experience. *Scarce skills*, in the parlance of the Department of Labour and the Sectoral Education and Training Authorities (SETA), is defined to refer to occupations in which there is “a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available, or (b) because they are available but do not meet employment criteria” (Foodbev SETA, 2005, 42).

This scarcity can arise either due to an absolute scarcity of these skills or a relative scarcity. Absolute scarcity refers to suitably skilled people that are not available, for example in a new or emerging occupation (e.g. biotechnology, information technology), a lack of sufficient numbers of workers with specific skills, or insufficient numbers to satisfy replacement demand (ibid, 42). Relative scarcity, on the other hand, refers to a situation where suitably skilled people exist, but do not meet other employment criteria, for example they live in different geographical areas, or do not satisfy Black Economic Empowerment criteria (ibid, 42).

Critical skills refer to specific skills within an occupation. In the SA context there are two groups of critical skills: (1) generic skills, including problem solving and learning to learn; language, literacy or numeracy skills; and working in teams for example; (2) particular occupational skills required for performance within that occupation (ibid, 43). It is the latter form that accounts for the problems that emerge when a firm experiences technological change or reorganises production methods (ibid, 43). These definitions underpin the understanding of skills shortages and must be kept in mind when diagnosing the nature of skills shortages.

However, skills shortages are not only about scarce and critical skills, which imply some form of advanced qualification in a ‘high skills’ environment. Indeed, one of the central tenets of Andre Kraak’s work (2004, 2005), has been that the emphasis on ‘high skills’ is not sufficient in a developing economy such as South Africa. The author notes that emphasising low skilled strategies should be viewed in a positive light, particularly with respect to addressing unemployment and stimulating labour-intensive forms of production (2004, 212). Furthermore, exclusive emphasis on the ‘high skills’ strategy ignores the tough conditions and constraints that developing economies face in their attempts to move up the value chain (ibid, 213). Consequently, we should think of “skills shortages” as comprising everything from the most advanced qualifications to the most elementary, and “skills development” as something that may be needed for different people at different

stages of their life cycle, or over the business cycle, or both.

The rest of this document proceeds as follows: firstly, the policy environment leading up to the suite of legislation promulgated in the late 1990s is reviewed from the perspective of prevailing academic literature devoted to this topic. Skills development was facilitated by at least four important policy documents: the Skills Development Act (1998), the Skills Development Levies Act (1999), the National Skills Development Strategy (2001), and the Human Resources Development Strategy (2001). The analysis then turns to the question of labour demand, specifically to the issue of identifying the nature of skills shortages, including scarce and critical skills, but also to some of the other initiatives such as learnerships that have become crucial to the effectiveness of the skills development regime. Labour supply questions are then addressed, including the nature of the education and training system in South Africa that has been formed since the enactment of the aforementioned legislation. Lastly, reflections on the interrelationships between demand, supply, and the institutional and policy contexts are made.

2. The Post-1994 Policy Environment

By 1994, South Africa's economy had undergone widespread changes to its industrial structure and trade policy. Over the period 1970-1995, the primary sector shed approximately 1.5 million jobs, the manufacturing sector saw approximately 400,000 jobs created, and the tertiary sector saw an increase large enough to make net employment creation between 1970-1995 positive¹ (Bhorat, 2000, 437). The impact of trade liberalisation – a hotly debated subject in the South African literature (see Holden, 1992; Bell, 1997; Fedderke and Vase, 2001) – can be considered to be ambiguous, where important distinctions lie in the causality attributable to trade liberalisation as opposed to technological change.

A more robust finding in the literature on changes to employment over time, however, has been that *skills biased* technological change has been experienced (Bhorat and Hodge, 1999; Edwards, 2002). The implication of this is that *within-sector* changes in employment have almost been more important than *between-sector* industrial structure changes when considering the nature (and skills intensity) of labour demand in South Africa.

How do these two sources of change affect the skills intensity of labour demand? Between-sector changes – e.g. a decline in primary sector employment experienced simultaneously as an increase in tertiary sector employment – can create *structural* unemployment. Here, workers that previously had the requisite skills to competently perform their tasks in the agricultural and mining industries (the primary sector), now face a sector with deteriorating terms of trade, and so have to seek work in the tertiary (services) sector. However, they do not have the requisite skills to enter the tertiary sector, where basic retail skills may be needed in addition to literacy and numeracy, and so are left without the human capital to make the transition to a new occupation. They are consequently structurally unemployed, and may face a much longer duration of unemployment as a consequence. This kind of change has the potential to create a *scarce skills* shortage, where both absolute and relative shortages of tertiary sector workers could be experienced.

¹ Note that while net employment was positive in numerical terms, these figures do not account for the growth in the economically active population over the period.

Within-sector changes result from skills biased technological change. Here, new technologies or methods of production are introduced by firms in an effort to increase productivity. At an individual firm level this results in the need to train workers, but at an economy-wide level, this could result in a *critical skills* shortage.

As a democratic nation, South Africa therefore found itself not only having to deal with the legacy of “*Bantu*” education and the resultant (absolute and relative) skills shortages associated with this, but also in a situation where reintegration into the international economy mandated skills biased changes to the methods of production and the world of work. The result: too few workers with adequate skills, or labour supply was not able to match labour demand. At the same time, we faced an unemployment crisis of historic proportion. The result: labour demand was not large enough to absorb the supply of labour. This seeming contradiction came to be known as the mismatch between labour demand and supply.

Enter the Skills Development White Paper, Bill, and finally the Act of 1998. As Kraak (2004) notes, the Skills Development Act (SDA, 1998) was successful in establishing a single national regulatory framework consisting of a National Skills Authority (NSA) and 25 Sectoral Education and Training Authorities (SETA). These in effect linked the training programmes at the national level with those at the sectoral level (ibid, 2004). Furthermore, the Workplace Skills Plans that all firms are required to submit to the SETAs link the firm level to the sectoral level. The importance of this relationship between micro (firm) level data, sectoral aggregation via the Sector Skills Plans, and national aggregation is perhaps one of the most under-valued aspects of the SETAs' work, for it represents a highly coherent framework for (firm-level) data collection that facilitates both the analysis and implementation of policy.

The NSA was a replacement for the previous National Training Board (NTB), while the SETAs were a replacement of the former Industry Training Board (ITB) (Kraak, 2004). Kraak (ibid) contends that the NSA was an improvement over the NTB because the NSA had more advisory power than the NTB in the form of being responsible for defining national skills development policy and for approving the allocation of funds from the

National Skills Fund. He (ibid, 2004) also states that the SETAs were an improvement over the ITB, whose legacy included:

- A decline in enterprises undertaking training initiatives;
- Only certain enterprises falling within a select few sectors volunteering to provide training;
- Enterprise training not being available at all qualification and occupational levels;
- A lack of private-public partnerships;
- The exclusion of the informal sector, pre-employed youth and the unemployed from the existing institutional framework; and
- Enterprises adopting a short-term approach to skills development.

With this new institutional framework established under the SDA of 1998, the path was set for a substantive change to skills development and the method of training workers. However, enterprise training in South Africa was also at historic lows up to this point, and the Skills Development Levies Act (1999) sought to correct this by creating a national levy system applicable to all enterprises based on taxing one per cent of payroll expenditure. Important to note in this regard is the fact that, while Government now levied one per cent of payroll, the King Commission's recommendations on Corporate Governance in South Africa suggested that enterprises invest four per cent of payroll expenditure on training. In this context, Government's levy can in fact be considered as crowding out enterprise's own training initiatives. The logic here though is that public provision of these services are necessary to correct the market failures associated with historically poor levels of investment by enterprises in personnel training.

The Department of Labour's National Skills Development Strategy (DOL, 2001) reiterated the importance of learnerships that was part of the SDA. Learnerships were seen as a complement to apprenticeships, and a key method to improve skills development for high, intermediate and low-level skills. The Human Resources Development Strategy (DOL &

DOE, 2001) sought to further target all three levels of skills development by focusing on linking:

- (a) General education provision (schooling, early childhood development, and adult basic education and training),
- (b) Supply-side dimensions of human resource development (including the provision of further and higher education and training),
- (c) Demand-side dimensions (i.e. demand for skills from employers in both the private and public sectors), and
- (d) National systems of innovation, research and development (ibid, 12).

With this as the policy context, we now proceed to evaluate the performance of some of the key implementing agencies of the skills development regime.

2.1 Performance of Government Skills Oriented Institutions

In this section we evaluate several key performance areas of the skills development institutions set up under the Skills Development Act (1998). To situate the discussion, it is important to note that efforts to upgrade skills have to be linked with the National Qualifications Framework (NQF). Therefore, learnerships need to be targeted to various NQF levels, and this requires co-ordination between the training providers, the SETAs, and the Department of Education. The merits of this system of accreditation are good in theory, but in practise have often resulted in long delays, frustrating training providers and thwarting their efforts to provide training. This is a key institutional bottleneck that has a decisive outcome on the entire skills development process as currently envisaged.

Assessing the performance of Government's skills oriented institutions implies that we also need to understand the assessment criteria against which success is judged. The Department of Labour (DOL) have used a very thorough strategy of targeting specific numbers of learnerships over a five-year time horizon (their latest targets and projections

are provided for the period 2005-2010 – see DOL, 2005b). However, Lundall (2003) has critiqued this method due to the emphasis placed on beneficiaries targeted, rather than the numbers of people who complete training and find employment or experience positive gains in existing employment. This is perhaps an indicator that could quite easily be incorporated into future monitoring and evaluation efforts by the DOL.

Noting these limitations, it is important to state that the DOL have been meticulous in their monitoring of the numbers of learnerships implemented by the SETAs, even if this is an imperfect indicator of success. Consequently, the thorough reporting of success indicators and projections of future performance targets allows us to gain important insight into the efficacy of the Learnership programme. Data for this section is largely taken from the DOL's (2005a) "State of Skills" report.

Table 1 provides an overview of the relationship between the NQF levels and skill levels referred to in the existing literature, as identified by Kraak (2005).

Table 1: Skill Levels on the National Qualifications Framework (NQF)

NQF Level	Skill Band
1	Low skill (pre-Matric)
2	
3	
4	Intermediate skill (equivalent to Matric and Matric plus diploma)
5	
6	High skill
7	
8	(equivalent to a higher education degree and postgraduate courses)

Source: Reproduced from Kraak (2005, 69)

Learnerships are predominantly (but not exclusively) directed to the intermediate skills level. However, the DOL does not disaggregate the targets and indicators of success by NQF level. Consequently, we can only evaluate the numerical performance of the SETAs. This is provided in Table 2.

Table 2: SETA Performance against the Growth and Development Summit (GDS) Learner Commitments (learners below the age of 35)

SETA	GDS Commitments	Total by March 2004	Difference
FASSET	1,200	2,931	1,731
BANKSETA	1,050	1,115	65
CHIETA	1,466	1,945	479
CTFL	1,080	1,914	834
CETA	2,174	1,042	-1,132
DIDTETA	8,600	1,423	-7,177
ETDPSETA	5,000	4,145	-855
ESETA	782	849	67
FOODVEB	1,200	2,199	999
FIETA	825	871	46
HWSETA	2,000	4,131	2,131
ISETT	1,500	2,935	1,435
INSETA	350	350	0
LGWSETA	670	3,110	2,440
MAPPP	653	1,182	529
MQA	7,340	4,089	-3,251
MERSETA	8,831	9,671	840
POSLEC	300	100	-200
PAETA	1,000	722	-278
PSETA	10,000	220	-9,780
SETASA	489	158	-331
SERVICES	4,148	8,212	4,064
THETA	8,000	7,011	-989
TETA	2,250	4,425	2,175
W&RSETA	2,000	4,556	2,556
TOTAL	72,908	69,306	-3,602

Source: Reproduced from DOL (2005a, 50)

Evident from the table is that despite the overall deficit of 3,602 learnership initiatives relative to 2003 goals, a large number of learnerships had been initiated by 2004. There were clearly more effective and less effective performers over the period, with LGWSETA and FASSET recording far more total learnerships implemented compared to 2003 goals, and DIDTETA recording the fewest number relative to 2003 projections.

As far as enterprise training initiatives are concerned, Table 3 refers.

Table 3: National Skills Fund Initiatives with SMMEs

SETA	Nature of Intervention	Beneficiaries Targeted or Reached
BANKSETA	Training of SMME Micro -finance institutions (MFI) as well as SMME borrowers	677 SMME MFI learners trained 500 SMME borrower enterprises completed training
CETA	Learnership for construction contractors	241 contractors in training
PAETA	Export readiness for emerging farmers	992 learners completed 570 in training
SETASA	Export readiness training SMME support	960 learners completed training 140 learners in training
THETA	Provider capacity building	91 SMME completed capacity building programme
TETA	SMME development in the small fishing boat industry	1,000 beneficiaries completed training
FIETA	Business development for SMME Skills programmes and support for learners in SMME sector	34 SMME receiving development support 500 SMME learners currently receiving support
W&RSETA	Skills support to SMME	2,000 SMME receiving support
MAPP	Skills programmes for SMME workplace providers	40 SMME workplace providers in training
FOODBEV	Skills programmes to support new and existing SMME Support network for SMME	727 learners in skills programmes 226 learners on learnerships for SMME 47 students receive bursaries while supporting SMMEs
MQA	Skills development for small miners	1,500 small miners in training
CHIETA	SMME development in chemical industry	10 SMME in training
Total Number of Beneficiaries Targeted or Reached		10,192

Source: Reproduced from DOL (2005a, 49)

From this table it is also evident that there is large variation in the level of outreach of the SETAs and their link to SMMEs. Clearly, this will be partially dependent on SMMEs complying with the SDA and SD Levies Act and submitting Workplace Skills Plans, since it is this that would provide the SETAs with the information needed to commence engagement and interaction. The corollary to this is that it is therefore also dependent on whether employers see value in the SETA's role and capacity. In this regard, Table 4 refers.

Table 4: Satisfaction with the Services of SETAs Rendered during 2002/03

Services	1	2	3	4	5*	Could not comment
	%	%	%	%	%	%
Advice and support (learnerships)	34.5	9.8	18.0	8.2	4.1	25.3
Easy submission procedures	30.9	7.2	21.6	7.7	3.6	28.9
Internet site and web pages	35.1	8.8	15.5	4.1	4.6	32.0
Promptness in paying grants	33.0	7.7	15.5	3.1	3.1	37.6
Providing information about courses, programmes and training	32.5	8.8	21.6	6.7	5.2	25.3
Providing information about grants	35.1	9.8	20.6	4.6	2.6	27.3
Providing Sector Skills Plans	40.2	9.8	14.4	3.6	2.6	29.4
Provision of free training not funded by employers	40.2	8.8	12.4	5.2	3.1	30.4
Response to queries	32.5	6.2	17.0	5.2	3.6	32.5

Source: Reproduced from DOL (2005a, 47).

* A score of 1 indicates that a respondent does not think the SETA did a good job at all, while 5 indicates the respondent thinks the SETA did do a good job to a large extent.

Evident from the table is the fact that in almost all cases, the majority of respondents thought that SETAs were not doing a good job. While this is an important result, it is not always clear whether employers always know exactly what SETAs should be doing. Recently the Minister of Labour (The Skills Portal, 2006) has had to remind the public that learnerships coexist with apprenticeships, and that these are initiatives that can be implemented simultaneously. It seems that there was a perception by businesses that apprenticeships were no longer possible to implement; legally, this is not the case, and businesses have never been prevented from training in this manner by any Government legislation. However, the fact that firms perceived the SETAs to be unsuccessful in so many different operational areas raises the fear that even if businesses have imperfect information about the precise role of the SETAs, they may become increasingly despondent with this dispensation.

The satisfaction statistics concerning the SETAs' performance will be an interesting and crucial indicator to track over time. If firms' perceptions remain so negative, it is likely that compliance with SETA procedures may deteriorate. Given the above, we now turn more directly to the demand for skills

3. Demand for Human Resources

In this section we review the literature on the demand for skills chronologically. There have been several surveys of skills in South Africa: The National Enterprise Survey commissioned by the Presidency in 1998; The World Bank Large Manufacturing Firm Survey (WBLMS) in 1999 and the World Bank Small, Medium and Micro Enterprise Firm Survey in 1999; the Human Sciences Research Council (HSRC) Survey of Skills in 2003, as well as the HSRC's (2003) Human Resource Development Report, a component of which identified key sectors and evaluated the state of skills; and the South African Investment Climate Survey sponsored by the World Bank in 2005. In addition, the SETAs' Sector Skills Plans also contain relevant information on skills and skills shortages, though by far the minority of SETAs contacted had up-to-date documents in this regard.

3.1 The National Enterprise Survey (1998) and World Bank Surveys (1999)

Bhorat and Lundall (2002) analysed the results of the National Enterprise Survey (NES) and the WBLMS. The WBLMS surveyed only manufacturing firms in the Greater Johannesburg area, whereas the NES surveyed a national sample with more service sector firms than manufacturing. In the NES, 35 per cent of all firms surveyed (894) identified "inadequate skills" as the most important reason why they were dissatisfied with firm productivity, while 19 per cent of firms thought it the second most important reason (ibid, 36). By sector, 24 per cent of manufacturing firms identified inadequate skills as the most important reason why they were dissatisfied with firm productivity, while in the service sector, 39 per cent of firms thought it the most important factor (ibid, 37). In the service sector, this was by far the biggest constraint to productivity improvements. However, this was not the case in the manufacturing sector, where the dominant reason for dissatisfaction amongst manufacturing firms was "poor employee motivation" (31 per cent) and "trade union disruption" (25 per cent) (ibid, 37).

Bhorat and Lundall (2002) also disaggregated the above results by size of firm, where it became clear that there was a sequential ordering in the priority of skills shortages by size category. Amongst the largest firms with employment numbers greater than 200, 65 per cent of firms surveyed thought skills to be a problem; amongst firms with between 100-199 employees, 30 per cent thought skills were a problem; amongst firms with between 50-99 employees, 5 per cent thought skills to be a problem, and amongst those with less than 50 employees, 1 per cent thought skills to be a problem (ibid, 38). While specific

occupational skills shortages were not examined in the NES, the importance of these findings was to add considerable nuance to the idea that skills shortages were ubiquitous. Service sector firms experienced greater shortages than manufacturing, while large firms by far experienced the greatest skills constraints.

As mentioned above, the WBLMS only drew their sample of firms from the manufacturing sector, but within this sector considerably more detail was provided concerning the precise occupations deemed by respondents to be in shortage compared to the NES. The WBLMS also had two components, the first surveying large firms while the second evaluated small, medium and micro enterprises (SMMEs). The sectors analysed in the WBLMS included: chemical products, electrical machinery, food processing and beverages, iron and steel, metal products, paper and furniture, textiles, and vehicle and automotive components. Among these sectors, the most skill intensive (defined as managerial, professional and technical staff) was chemical products, vehicle and automotive components, and electrical machinery (Bhorat and Lundall, 2002, 11). The least skills intensive by far was textiles, followed by food processing.

Evaluating large firms first, Chandra, Moorty, Rajaratnam and Schaefer (2001, 40) demonstrated that the racial composition of employees in all firms displayed clear numerical biases against historically disadvantaged individuals (HDIs) the more highly skilled the occupation. The most highly skilled occupations (managerial, professional and technical) had fewer than 20 per cent (managerial) and 30 per cent (professional and technical) of HDIs, whereas the least skill intensive (plant operators and labourers) employed more than ninety per cent HDIs (ibid, 40). However, it was also hardest for firms to find suitably qualified individuals in the more skill intensive sectors including those mentioned above, but also service-related skills such as accounting, marketing, financial, legal, and even craft related trades (ibid, 41).

As far as specific occupations deemed to be in shortage is concerned, Bhorat and Lundall's (2002) analysis identified the following occupations by size of firm for the WBLMS:

Table 5: Firms in the WBLMS finding it “hard” or “very hard” to find Specific Occupations (percentage), by Size Class

Occupation/Size Class	50-99 Workers	100-199 Workers	200+ Workers	Total
Managers	70.55	81.82	90.43	79.27
Prof & Tech	71.23	81.82	90.43	79.57
Clerks	34.25	29.55	32.98	32.62
Sales & Service	50.00	64.77	71.28	60.06
Craft	51.37	64.77	72.34	60.98
Operators	36.99	47.73	43.62	41.77
Labourers	4.11	7.95	3.19	4.88

Source: Reproduced from Bhorat & Lundall (2002, 17)

Among smaller firms, Chandra, Moorty, Nganour, Rajaratnam and Schaefer (2001) sought, among other things, to verify the finding that the primary factor constraining employment growth was a scarcity of skilled labour, as evidenced in the Large Manufacturing Firm Survey. While similar demographic trends (shortage of HDIs at highly skilled levels) were present in the employment profile of SMMEs (ibid, 23-24), the specific industrial sectors that experienced difficulty in finding skilled workers in the Greater Johannesburg Metropolitan Area included furniture (57 per cent of firms surveyed), metal workers (48 per cent of firms surveyed), clothing (40 per cent of firms), food and beverage (35.7 per cent), construction (45 per cent,) information technology (43 per cent), tourism (42 per cent) and retail (21 per cent) (ibid, 25). Specific occupations, that may have been in shortage amongst SMMEs, was not reported in this survey.

3.2 The Human Sciences Research Council (HSRC) Report in 2003

In this section we analyse the results of the HSRC's *Human Resources Development Review* of 2003. This was a very large research project facilitated by the HSRC that drew together eminent scholars in South Africa to produce an omnibus report that evaluated both demand and supply-side aspects of the economy in general and the labour market in particular. In this section we will only be concerned with the latter part of the HSRC document, which forecast demand for scarce skills and then discussed

several key 'high-level' sectors that were deemed to have skills shortages. These sectors included educators, academics, medical practitioners and nurses, engineers and technicians, biotechnologists, managers, and information and communication technology professionals.

Analysing the demand for occupational employment, Woolard, Kneebone, and Lee (2003) forecast demand for scarce skills over the period 2001-2006, focussing on both net changes in occupational employment as one aspect of future demand, and replacement demand (resulting from retirements, net migration, inter occupation mobility, and in-service mortality) within each occupation. Key results (ibid, 468-470) included that:

- (1) Demand for engineers and natural scientists is strong;
- (2) IT professions will also be in high demand;
- (3) Growth in the number of educators and nurses will depend on the government fiscal stance, which has a degree of ambiguity;
- (4) Demand for managers is expected to be small as firms remain small and strive to become globally competitive, but demand for managers with financial and people skills was expected to be stronger.

Considering the interaction between demand and supply for certain sectors, the following results were obtained (ibid, 470-472):

1. Academics:

- Shortage of academics given the vacancies at many institutions and the increased reliance on foreign nationals.
- Shortage of PhDs among staff in tertiary institutions.

2. Doctors and nurses:

- Shortage of nurses due to poor working conditions, low salaries and HIV/AIDS.
- This shortage will continue to exist for doctors due to emigration overseas.

3. Computer-related professionals:

- Demand of these exceeds supply.
- There is sufficient entry level supply but a lack of highly skilled professionals.

4. Scientists and science technologists:

- Inadequate attention to mathematics and science in school limits the supply of this group and cannot keep up with demand.
- No shortage in biological science occupations due to restrained government expenditure.

5. Educators

- 70,000 educators need to be trained between 2001 and 2006.
- Supply of educators is insufficient.

6. Engineers and engineering technicians

- Evidence is not clear whether there is a decline in demand for engineers or a lack of supply.
- Oversupply of engineers and technologists in mining and metallurgy, but an undersupply in electrical, chemical and industrial engineers.
- Shortage of engineers from previously disadvantaged backgrounds. These people are in high demand.

- Shortage of experienced engineers required for management positions.
- Shortage of engineers with IT-related skills.

A key conclusion reached by the researchers was that demand for high-level human resources was expected to be low over the forecast period. Only demand for engineering technologists and computer-related professionals was projected to increase greater than 2 per cent (ibid, 472). Replacement demand was also expected to be strong due principally to the impact of HIV/AIDS, retirement, emigration and mortality (ibid, 472).

One of the limitations with Woolard, Kneebone and Lee's (2003) analysis that we can now identify three years after the study was completed is that the assumed sectoral and economic growth rates were perhaps too low relative to what SA has experienced since 2003. This is likely driving the conclusion of low demand for high-level human resources. In the next section, we turn to two more recent surveys conducted assessing the demand for human resources.

3.3 Surveys and Skills Assessments in 2005 and 2006

In this section, we analyse the results of three of the most recent outputs on skills training: (1) A private sector firm called DYNA Training, which undertook an investigation called the South African Leadership Trends survey, the results of which were released in October 2005, (2) The Department of Labour's "State of Skills 2005" document, which aggregates information from the SETAs to provide a list of skills shortages, and (3) The Department of Home Affairs' published list of scarce and critical skills, released in the Government Gazette in February, 2006.

DYNA Training's survey of leadership trends undertook a national sample of 105 companies across all SETA sectors (and therefore all economic sectors were sampled). However, the response rate to the survey was only 57 per cent or 60 firms in total (DYNA, 2005, 2). This limitation is not deemed to be too important since the objective of the survey was only to evaluate management competencies within firms, rather than any other occupations. Also, a highly diverse group of respondents made this sample very interesting, including the SA Navy, Vodacom, BMW, Shell, Department of Public Enterprises, Advanced Software Designs, Murray and Roberts, and many others (ibid, 23).

We have seen from all of the above surveys, including the NES, WBLMS, WBSMMES and HSRC that management is consistently identified as an occupation with scarce and critical skills shortages. The contribution of the DYNA document is therefore its specificity with respect to this profession. The results reported differentiate between various levels of management, starting with “Emerging”, “Supervisory”, “Middle Management”, “Senior Management” and concluding with “Executives”. As far as assessing the performance and skills needs of management echelons are concerned, nine major competency areas were distinguished: “Managing People”, “Self Management”, “Leadership Competencies”, “Results Orientation”, “Communication”, “Business and Entrepreneurial Competencies”, “Professional Competencies”, “Interpersonal Skills” and “Personal Qualities”. For a detailed explanation of the component skills of all of these essentially qualitative indicators, DYNA Training (2005, 24) provide complete definitions (reproduced in Appendix 1).

Within each of the above nine competencies: the five skills deemed by firms to be most scarce among managers are (ibid, 6):

- (1) People and staff management (under the “Managing People” category),
- (2) General leadership dynamics and management (under “Leadership Competencies”),
- (3) Sales and marketing, but also project management (under “Professional Competencies”),
- (4) Budgeting, finance and entrepreneurial skills (under “Business and Entrepreneurial”), and
- (5) General communication skills (under “Communication”).

Disaggregating by managerial echelon (emerging, supervisory, middle management, senior management, executive), “managing people” was deemed to be the most critical skills shortage for emerging, supervisory, and middle management, while “leadership competencies” was the most critical skills shortage for senior management and executives (ibid, 9-11).

The details provided by this survey point to interesting implications. For example, there is evidently a need for more training initiatives across the spectrum of managers, yet the ability to provide adequate training in this respect is clearly a tougher problem to address. On the one hand, a skill such as “better financial administration” is likely related to accounting training (and possibly to the sub-discipline of management accounting), but “managing people” is clearly less defined, related to human resource training but not restricted to it.

In many ways, the findings of this survey were similar to those by Horwitz and Bowmaker-Falconer (2003) in the HSRC Review (2003), who found that two key challenges facing managers in SA are: (1) building managerial competencies, and (2) harnessing managerial diversity. These qualities are concepts that go beyond easily identifiable education and training requirements, and point to the specificity of occupational training needs.

Moving now to a complete identification of skills shortages, the most recent information from the DOL is the “State of Skills 2005” report. A complete list of scarce skills from this document is given in Appendix 2. However, the identification of these skills by itself is not the focus of this discussion. Rather, the interaction of this list with a recently released list by the Department of Home Affairs (DHA) is discussed.

The Department of Home Affairs (DHA) published a list of “scarce and critical skills”, for which special exemption to normal immigration requirements (in terms of the Immigration Act of 2002 and the Immigration Amendment Act of 2004) has been affected. On February 8, 2006 (later revised on February 14), selected occupations and quotas of individuals in each of those occupations were published in the Government Gazette. Appendix 3 contains the list and quota numbers of each of those occupations deemed to have scarce and / or critical skills shortages.

This document is to date the most defined and detailed in terms of identifying skills shortages. The Notice in the Gazette refers to the fact that the list was compiled after consultation with both the Department of Labour and the Department of Trade and Industry, but makes no additional reference to sources or methods used. There is also no justification given for the numbers of individuals (quotas) stipulated. However, the use of immigration laws to encourage the reduction of skills shortages in South Africa follows a very long list of nations that have invoked similar laws. Most recently, Germany issued immigration exemptions to Indian workers in the information technology sectors in recognition of its perceived shortages in this sector and the occupations that populate it.

However, while the principal of importing skills is a sound one, the precise occupations identified by the DHA is perhaps more debatable, even more so when one questions how they arrived at the specific numbers. When compared with the Department of Labour's list of scarce skills, the two documents diverge. The DOL's list contains occupations that include machine operators and managers, whereas the DHA's list does not. This has profound implications for the skills regime, as it means that we cannot import managers or 'lower-skilled' plant operators.

The effect of the DHA's list on reducing skills shortages is actually more problematic than the above suggests. This is because in the past (between 2002-2005), all that was needed by the Department of Home Affairs for a skilled person to enter SA under the old quota system of the Immigration Act (2002) was evidence that the individual possessed a set of skills. These included (a) an individual with an undergraduate degree and several years of experience, (b) a postgraduate degree with fewer years of experience, or (c) an entrepreneur that had demonstrated capacity over a given period of time.² The effect of the new legislation has been to restrict every occupation other than those identified in the Government Gazette (reproduced in Appendix 3). In other words, people who were generally considered to be skilled under the old quota system, now find themselves excluded if their occupations are not on the new quota system. Furthermore, under the old quota system, an exemption called the "General Work Permit" category allowed an employer to employ a non-resident senior managerial employee without needing any other information. This has now been withdrawn, making it far more difficult for managers to enter the country if they are not part of the occupations in the new quota system.

Perhaps ironically then, the new legislation poses far more binding constraints on the ability to source scarce and critical skills abroad, and thus undermines its stated purpose. This exacerbates the 'critical skills' shortage in that it prevents firms from easily importing the required expertise. Moreover, the fact that there is no disclosed methodology to the list of occupations identified or the numbers of individuals stipulated under the quota system implies that we could be running the risk of identifying the wrong (or insufficient) occupations as scarce, or the wrong numbers of scarce people in those occupations, or both.

2 The information in this section was obtained in a personal interview with a labour lawyer from Cliffe-Dekker Attorneys. A personal interview with the South African Chamber of Business corroborated the findings reported.

4. Supply-Side Concerns

In this section we are concerned with two major themes, (a) enterprise education and training initiatives, and (b) secondary and tertiary education and training initiatives. We commence by reviewing selected evidence of the stock of human capital among South African workers before proceeding to each of these two sectors.

4.1 Enterprise Training

In their assessment of the World Bank Large Manufacturing Survey (WBLMS) data, Borat and Lundall (2002, 20) found the following relationships between firm output and employment, capital and training: a one per cent increase in employment results in a 0.45 per cent increase in output (known as the output-employment elasticity); a one per cent increase in capital leads to a 0.33 per cent increase in output; and a one per cent increase in training expenditure leads to a 0.16 per cent increase in output. Training expenditure clearly has a positive impact on output, but its impact is less than improving productivity by upgrading the capital stock. That said, it is likely much cheaper to train than to upgrade the capital stock or increase employment numbers for that matter, making this form of productivity enhancement highly cost effective. This was confirmed in the National Enterprise Survey (NES), where 51 per cent of firms stated that the most important activity that they had engaged in to improve labour productivity was to provide training (in the previous two years) (ibid, 39).

While the advantages of training seem clear, it is an unfortunate but highly consistent finding that South African firms under-invest in it. In the WBLMS, less than half of the firms surveyed provided in-house or outside training programmes (Chandra et al, 2001, 44). In-house training was provided by approximately 36 per cent of firms for high and low skilled workers and by 48 per cent for semi-skilled workers. As far as outside-training is concerned, 42 per cent of firms undertook training initiatives for managers, 37 per cent trained semi-skilled workers, and 9 per cent trained unskilled workers (ibid, 44). An important finding of this survey was that there was no statistically significant evidence to suggest that trained workers leave the enterprise after training initiatives (ibid, 45), an oft-cited reason for firms to refrain from the training investment.

For smaller enterprises, the WB SMME Survey found that only 25 per cent of firms invested in any training initiatives at all, compared to about 45 per cent of large firms (Chandra et al, 2001, 26). Furthermore, it was noted that because of resource constraints within SMMEs, they were more dependant on Government forms of assistance. When evaluating the actual percentage of firms rating various training sources as important, in-house training was considered to be important by 72 per cent of firms, followed by private training (30 per cent), vocational / technikons (30 per cent), business partners (23 per cent), industrial training boards (22 per cent), universities (16 per cent), Government institutes (13 per cent), and church / community based training (3 per cent) (ibid, 26). Clearly then, SMMEs place greatest importance on in-house training, yet are financially constrained to provide it.

Commenting on the level of enterprise training between 1998 and 2002, Badroodien (2004, 156) notes that employers had not increased their level of participation in skills formation in the country. Of the firms that train in low-skill sectors, these insist on in-house training that is typically unstructured, runs for a short period, and tends to focus on competence for the workplace rather than high levels of skills development as intended by the NSDS (ibid, 156). A particularly troubling finding of Badroodien's work (ibid, 158), is that the majority of firms that train in the high-skill sectors reinforce working cultures of the past, such as gender and racial discrimination.

The latest information on the state of training amongst South African enterprises is provided by the World Bank's Investment Climate Survey, released in December 2005. This survey focussed on three sectors: construction, manufacturing, and the retail / wholesale trade. An important finding of the survey was that individuals that received training in the past earn about 30 per cent more than individuals that had not received training, other factors held constant (Clark et al, 2005, 60). However, the disturbing finding was that in 2005 – six years after the WBLMS and WBSMME surveys were conducted – South African firms still only trained about 45 per cent of workers. Table 6 compares South Africa's training levels with a group of comparators.

Table 6: Comparison of South Africa's Training Levels

Country	% of Skilled Workers	% of Unskilled Workers
Brazil	77.3	68.3
China	69.1	63.0
India	55.0	33.0
Poland	79.9	86.2
South Africa	44.6	45.8

Source: Reproduced from Clark et al, 2005, 65

The fact that SA firms still only trained about 45 per cent of their workforce (a similar number to the WBLMS), suggests that despite five years of positive and fairly robust economic growth, combined with the augmentation of the National Skills Development Strategy and National Human Resource Strategy, local companies were not responding to incentives to provide training. This also suggests that public sector initiatives such as learnerships have an important role to play in increasing the level of training in firms.

4.2 The Education System and Education Providers

In this section we begin by analysing some of the data concerning students' choices post secondary school and the reasons for these. We then proceed to evaluate private education institutions, further education and training colleges, technikons and universities.

4.2.1 Learner Choices Post Secondary School

Cosser and du Toit (2002) analysed the factors that affected the choices of Grade 12 learners in their transition to higher education. South Africa's higher education participation rate of between 15-18 per cent was below the 20 per cent benchmark given for middle income developing countries, and the National Plan for Higher Education was designed largely to remedy this (ibid, Foreword). Cosser and du Toit's (2002) work, therefore The main objectives of FETs is to address the broad socio-economic issues of unemployment, income inequality and poverty by creating opportunities for young people and adults to further their education and consequently become employable, to encourage on-the-job training, and to include new curriculum areas in FET (Gamble, 2004, 190-191). The FET sector in South Africa is consequently touted as a major contributor to the reduction of intermediate skills shortages in South Africa. Gamble (2004, 173-175) discusses the characteristics of intermediate level knowledge and skills in terms of how it differs from low or high-level skills: intermediate level knowledge and skills are best described as skills held by workers in the craft and artisanal trades, where knowledge is a combination of theory and practise, and the emphasis is on the practical rather than the conceptual. Low-level knowledge and skills refer to trades where workers can become highly proficient in performing particular routines and procedures without understanding the entire process, typically present in mass production enterprises. High-level skills can be characterised by 'principle through procedure', where engineers for example have complete knowledge about a particular process. At this level, however, the emphasis is on the conceptual

rather than the practical, as there is usually a managerial component to the work of the engineer (ibid, 175).

McGrath (2004a) evaluates, among other things, the policy process that led to the promulgation of fifty new FET colleges in 2001. A major criticism the author has of this process is that there were unanswered questions about the focus of these institutions and about their coherence with other elements of the education and training landscape (ibid, 173). The major recommendation of the author is that these unanswered questions need to be addressed in order to create some degree of certainty in the future progress of the colleges and their role in intermediate skills development (ibid, 173). Gamble (2004, 186) identifies a paradigmatic shift that has taken place in this sector, characterised by the transition away from Vocational Education Training (VET) to FET, which, in the author's view, represents a dilution of intermediate level knowledge and skills as a result of "neoliberal economic policies".

Gamble's (ibid, 192-193) recommendations for the sector include the fact that an ideal FET curriculum needs to make a clear distinction between low, intermediate and high level knowledge and skills, while at the same time incorporating aspects of both theory and practise in that occupation. This would strengthen intermediate level knowledge and skills but move away from the manner in which they were previously associated with trade apprenticeships that were characterised by 'mindless' doing in response to pre-specified procedures (ibid, 193).

Unwin (2003) evaluates the sector less from a curriculum point of view and more at the operational level. The author deems FET colleges to have a vital role to play in addressing the social and economic challenges in SA, and states that they need to form partnerships and work together to help achieve this (ibid, 11). Unwin also identifies a need for a "new type of infrastructure" to enable networks of college Principals and staff to share good practise and provide mutual support (ibid, 11).

Cosser (2003a) reports on information provided by graduates from FET colleges. Key recommendations include:

- (1) That institutions should provide a more deliberate, intensive and sustained job placement service for learners, which will give them more exposure to the workplace and provide valuable work experience, thereby improving the employability of college graduates (ibid, 54);

- (2) A partnership should be formed between the DOE, FET colleges, local government and industries in order to maximise the contribution of FETs to the local, provincial and ultimately national economy (ibid 54);
- (3) All stakeholders need to establish a viable quality assurance system (ibid, 55);
- (4) More research is needed to fully understand how colleges contribute to the skills development needs of SA (ibid, 55).

Cosser (2003b) reports on letters sent to the HSRC by technical college graduates. The letters are not from a representative sample, but were designed to focus attention on broad areas of concern for graduates, and areas that articulate well with FET college sector challenges (ibid, 83). Three major issues highlighted by students are the fact that further education is difficult, many of them are unemployed, and township colleges are of an inferior quality and need assistance in order to make them more effective (ibid, 86-88). The major conclusion that the author makes is that the education and training system has failed to channel college graduates into appropriate career paths (ibid, 92).

Maja and McGrath (2003) evaluate the level of employer satisfaction with graduates of FETs. Here it was evident that 73 per cent were either satisfied or very satisfied with the overall provision of workers, and most thought positively about the colleges' quality and relevance (ibid, 63). The majority of employers were also favourable about specific areas such as the theory-practise balance, relevance, core work skills development and staff competence. However, the response rate of employers was fairly low, and many were not aware they employed college graduates (ibid, 63). Employers identified that they needed graduates to have better problem-solving skills, and the overwhelming majority of employers identified the lack of work experience as a major problem (ibid, 64).

4.2.2 Higher Education

In this section we briefly review the higher education sector. Total enrolments in higher education are provided in Table 7.

Table 7: Headcount Enrolments in Tertiary Education

	1993	1995	1997	1999	2000	2001	2002	2003
University Enrolments	340,000	385,000	380,000	384,000	388,369	428,648	460,438	488,000
% Change		13.24	-1.30	1.05	1.14	10.37	7.42	5.99
Technikon Enrolments	133,000	184,000	200,000	208,000	202,792	224,327	214,690	230,000
% Change		38.35	8.70	4.00	-2.50	10.62	-4.30	7.13
Total Enrolments	473,000	569,000	580,000	586,000	591,161	652,975	675,128	718,000
% Change		20.30	1.93	1.03	0.88	10.46	3.39	6.35

Source: Reproduced from Department of Labour (2005, 23); Own Calculations

From the table it is evident that there has been fairly robust growth in university enrolments since 2000, while technikon enrolments have been more volatile. Both of these sectors have undergone considerable structural and institutional change, so it is not surprising to see a level of volatility in the numbers. Total enrolments in tertiary education institutions have always been positive since 1995, though without comparing this against the growth rate in the number of matriculants it is harder to judge the true success of these numbers

4.2.3 Private Education Provision

We now turn to a burgeoning development in the institutional landscape, namely the growth of private education institutions. Glenda Kruss (2004) undertook a very important study in this area, and immediately established the context that private education is a reality in SA that must be engaged with, rather than taking a position for or against it (ibid, 1). She distinguishes between private sector institutions that offer learners credentials and those that offer mobility. Here, the 'mobility' private sub-sector is more directly in competition with the public sector education providers, while the 'credentials' sub-sector

potentially operates more strongly in a complementary manner, in that it offers education and training at levels and in fields that are not sufficiently developed in SA (ibid, 8).

The methodology employed by the author was to select a set of institutions to undertake a qualitative study based on a variety of factors, including function, funding and governance (ibid, 13), and whether they constituted one of four categories: (1) trans-national institutions, (2) franchising colleges, (3) technical and vocational education and training, and (4) corporate classrooms (ibid, 19-21). A major contribution of this book is that it provides a foundation for the systematic empirical evaluation of the private education sector.

Key findings at the institutional level include that trans-national institutions may be characterised as:

- Institutions that respond to a demand for international mobility;
- Franchising colleges may be characterised as institutions that respond to a demand for local mobility;
- While the other forms of private providers primarily function to meet a demand for recognised credentials that have high status and ensure direct employability in a specialised niche market (ibid, 114).

At a more macro level, key findings include:

- The fact that the 'mobility' private sub-sector is potentially problematic because it operates in competition to national higher education goals, rather than in a complementary fashion (ibid, 121);
- There is some competition at the intermediate level between 'credential' private providers and technikons (ibid, 124);
- There is evidence of a degree of convergence in the provision of Further Education and Training (FET) and Higher Education and Training (HET) level programmes by different institutions, including universities, technikons, FET colleges, and private providers (ibid, 126);

- Part of the controversy surrounding the polarisation of public versus private providers in SA is due to a legislative definition of higher education that includes all post-schooling qualifications, and that attempts to integrate education and training into the National Qualifications Framework (ibid, 126);
- More direct engagement with the private education sector is necessary in order to understand its role and encourage integration into national educational needs.

5. Intermediating Between Demand and Supply: The Broader institutional Context

Up until this point, we have treated labour demand and supply-side issues as distinct entities. In this section the objective is to focus on what the findings above imply about the present skills development regime and the prospects for ameliorating the mismatch between labour demand and supply. The key to doing this is to understand the interconnection between the broad (economic, social and skills-based) policy processes and the labour market outcomes, since policy has been implemented to correct the market failures associated with the Apartheid regime.

In terms of the broad policy context, one of the issues that will be crucial over the next decade, and that is explicitly acknowledged in the Human Resources Development Strategy (DOL & DOE, 2001), is the manner in which the national system of innovation interacts with the economic growth trajectory. National systems of innovation, research and development also interact with the skills development regime because the Department of Trade and Industry's planned industrial strategy is based to a large extent on the beneficiation of the given endowments of resources in this country. The National Advisory Council on Innovation (NACI) is a statutory body whose mandate is to advise the Minister of Science and Technology on the role and contribution of innovation in promoting national objectives. It has produced several documents on innovation, including the National Biotechnology Strategy for SA (NACI, 2001), the National Advanced Manufacturing Technology Strategy (NACI, 2003), and several other reports on everything from open-source software to how to achieve competitiveness.

In the National Advanced Manufacturing Technology Strategy (NACI, 2003), the goals were, amongst others, to develop a vision of the technological profile of the industrial sector in the year 2014, to stimulate technological upgrading in industry, and to facilitate the flow of technological resources to industry through new knowledge networks to foster innovation (ibid, 9). From the human resources point of view, this required "wide consultation with industry, local and international science councils, tertiary education institutions, labour and government" (ibid, 11). From an educational point of view, this requires greater collaboration (a) within disciplines, (b) between disciplines, and (c) between sectors and technology focus areas (ibid, 12). The principles encapsulated here are extremely important, for implicit in them is the need for the *general education system* to evolve and deliver the human resource needs of the country.

Kraak (2005, 57) notes that due to the rise of the new global economy, characterised by high-quality, high value-added export-oriented manufacturing and services, a key quality of human resource development is the attainment of high participation rates in general education and training, and in particular, the development of multi-functional skill capabilities. These are only achieved “with high levels of general education upon which appropriate forms of vocational and career-oriented training can be optimally built” (ibid 57).

With respect to a more specific labour market context, Kraak and Young (2005, 17) put forward the position that the key to a successful human resource development strategy is a multi-layered and differentiated emphasis that promotes high-, intermediate- and low-skills simultaneously, ‘joining up’ so as to promote social inclusion, access to education and training for more people, and increased employment. They distinguish this approach from the ‘high-skills thesis’, because it starts from the premise that high-skills alone are the most important to develop. The authors note that the NSDS is in fact trying to impact all levels of skill; it is a very ambitious project with many structural and institutional obstacles (ibid, 17).

Many of the present obstacles faced include an inherent weakness of the new state institutions, the three most important implications of which are:

- (1) The strong emphasis on state planning in a context characterised by weak national information systems;
- (2) A proliferation and bureaucratisation of the new institutions with insufficient regard given to society’s capacity to manage and steer the new structures; and
- (3) The continuation of a ‘voluntarist’ and ‘short-term’ employer mindset towards enterprise training (ibid, 16).

Central to understanding the institutional limitations is the fact that, “(w)hile the policy framework has been detailed in defining the planning architecture, it has been extremely thin on developing much needed capacity” (ibid, 16). Consequently, there has been an overemphasis on the planning perspective and the outputs of the NSDS, accompanied by

an under emphasis of the process of implementation and the capacities required (ibid, 16). This can be seen in the proliferation and bureaucratisation of structures accompanied with the NSDS.

“(A) key sub-component of the new institutional environment comprises those institutions concerned with the design, registration and quality assurance of qualifications, which include 12 National Standards Bodies (NSBs), over 100 Standards Generating Bodies (SGBs) and many Education and Training Quality Assurers (ETQAs). The management of this entire system of institutions falls to the SA Qualifications Authority whose main functions are to oversee the development of the NQF, to register NSBs and SGBs, accredit ETQAs, and lastly to ensure international comparability of standards and qualifications.” (ibid, 17)

Kraak and Young (2005) consider the final problem facing the NSDS to be the continuation of a ‘voluntarist’ and short-term’ mindset towards enterprise training among employers. Here, McGrath (2004b) makes a contribution to the debate by discussing the challenges posed by combining skills development and enterprise promotion policies. He considers this within the context of a ‘joined-up’ policy environment, and so evaluates the success of the major government departments (including the DTI, DOL and DOE) and the level of co-ordination between them. This is perhaps an under-valued feature of the post-1994 environment, where the simultaneous promulgation of numerous Acts in different but related departments, such as the DTI, the DOE and DOL, has served to combine and create a fairly complex regulatory environment. While policy co-ordination is of course necessary, it is also a difficult task at the best of times, and this contribution points to further examples of co-ordination failure.

For example, the author notes that different notions exist between government departments regarding SMME training needs: the DTI historically favoured internships for SMMEs, while the DOL identified learnerships as the appropriate instrument (ibid, 200). There is also a degree of policy incoherence between the DOL and the DOE that constrains the ability to move to a more inclusive higher-level skills economy (ibid, 203). Education policy does not appear to regard skills development for enterprise development as a priority and, therefore, the DOE is not in consensus with the national policies of the DOL, which has undermined the prospect of government creating a coherent strategy on skills (ibid, 209).

6. Discussion

This paper has undertaken a review of skills shortages in South Africa. A key component of this review has been the acknowledgement that all tiers of skills are important, including 'high-skills', 'intermediate-skills' and 'low-skills'. At the same time, we have focussed on the interaction of the skills development regime with the economic development regime more broadly. The most succinct aspect of this discussion has been that regarding the national system of innovation and the requirements of the general education system, combined with the specific set of skills development institutions. However, while the national system of innovation in many ways biases the 'high-skills' component of skills development, it should be stressed that the upstream and downstream implications of this do not necessarily imply that only 'high-skilled' occupations should benefit. A key component of the industrial policy framework should therefore be tied to ensuring that the beneficiation so highly coveted in industrial policy also promotes the proliferation of opportunities for 'intermediate' - and 'low'-skilled people.

Perhaps the most critical needs among South Africa's skills development institutions are:

- (a) Effective inter-departmental collaboration, and
- (b) A more streamlined bureaucracy.

We have seen that the broader skills development framework draws together the DOL, DOE, DTI, DST and DHA. The lack of co-ordination between the DOL and the DOE is perhaps the most critical issue at this point. The various organs of state are simply not doing enough to integrate the learnerships with the NQF, and without doing this, the system becomes highly sub-optimal. After all, the broader education policy context in South Africa was formulated precisely to allow for programmes such as learnerships to be formally recognised (through the NQF), allowing qualified individuals a significant degree of transferability associated with their newly acquired skills. Without this, the foundation of the system is compromised, and this cannot be allowed to continue.

The lack of synthesis between the DHAs recently published list of scarce skills and the DOL's published list of scarce skills is another critical disjuncture. While it must be acknowledged that the DHA's intention is to help the country import needed foreign human resources rather than identify scarce skills *per-se*, a closer look at the content of

that legislation demonstrated that even in this regard it fails. It has unambiguously made importing skilled individuals harder. The fact that this list is so explicit then also raises the question of whether the DHA has identified the correct occupations, and in this regard it seems *not* to be the case. Here the comparison with the DOL's Table in Appendix 2 is instructive, and from this table one can deduce that 'high-skilled', 'intermediate-skilled' and 'low-skilled' occupations all have shortages in certain sectors. The DHA's emphasis on 'high-skills' only is thus detrimental to the country's needs, and this should be revisited.

As far as the institutions of labour supply are concerned, here it is evident that the plethora of FETs have slotted into the education system in a highly idiosyncratic manner. There are questions of curriculum that need to be dealt with, but also questions of parity between township institutions and urban institutions. There is also a need for these to feed into and work more closely with employer groups. Since FETs are one of the main providers of 'intermediate-skills', their successful operation will play an important role in this country's development. The success of the general education system must be stressed if we are to effectively alleviate skills shortages in the medium- to long-term.

7. Policy Recommendations

In this section we identify selected policy interventions that may increase the efficacy of South Africa's skills development institutions and their labour market outcomes. The two most important principles surrounding our skills development regime are:

- (1) Availability of skills training to economically active (aged 16-64) individuals, including the unemployed and extending to highly skilled professionals, and
- (2) Transferability of skills training once a qualification has been achieved.

Furthermore, the acknowledgement that South Africa has pervasive skills shortages implies that closed-economy solutions to the problem are necessary but not sufficient; firms must have the option to import scarce skills and to do so quickly and efficiently. Finally, we discuss the issue of including measures of productivity into the skills development regime.

As far as availability of skills training is concerned, there are two dimensions to the problem: (a) training the unemployed, and (b) training the employed – from low- to high-skilled. For the unemployed, it is imperative that SETAs spend their budgets to develop general and specific training programs. It cannot be stressed strongly enough that training for the unemployed is a public good in the classic sense, which means that the market is unlikely to provide it, so the state must take the lead in this regard. Without developing suitable programs, *possibly one of the most powerful abilities of the SETAs to effect meaningful change in the national labour market is compromised*. These initiatives must be well targeted, and this could be better achieved if SETAs pooled financial resources for this purpose and developed cross-SETA training programs.

For those already working, it is more important for training programs to be linked into the National Qualifications Framework (NQF) for non-professional workers. This is the key to upgrading the skills set of low- and semi-skilled workers. At the same time, it increases the transferability of these skills. Note that SETA training initiatives are already designed to integrate with the NQF. However, anecdotal evidence of inter-departmental acrimony between the DOL and DOE has prevented this very important component of the

skills development regime from performing optimally. Practically, this means that training providers struggle to accredit their training programs. A key policy recommendation is therefore to fast-track the bureaucratic process in this regard.

Administratively, the existence of so many SETAs raises the question of duplication of effort. It seems clear that this is evident in training the unemployed for example, where information and initiatives across the SETAs would be much more effective than individual SETAs developing programs individually. Additionally, and perhaps more fundamentally, cost-saving interventions such as sharing information systems could go a long way to increasing the efficacy of the SETAs and the numerous tasks they are mandated to perform. This is not to disregard the activities that are clearly unique to individual SETAs, but since all of them are governed by the same information procurement protocols – i.e. soliciting information from member firms – there is no reason why this process cannot be standardised and possibly centralised. This would serve the dual purpose of eliminating the possibility of fraudulent companies seeking reimbursement for training initiatives from multiple SETAs.

Regarding immigration of skilled workers, there are important economic principles at play here. Effectively, the skills development regime (legal and institutional) in SA starts from the premise that we have a (inherited) problem with skills in this country. The major way this is addressed is through the SETAs and the general education system. However, this framework – even if optimally administered – can only solve the problem in the medium- to long-term. They are closed-economy solutions. In order to speed up the process, you need to import skills; this is an open-economy solution. *Both closed- and open-economy solutions to the problem of skills shortages are necessary in South Africa.* At the moment, the DHA is actively undermining (explicitly or implicitly) the potential of firms to import scarce skills. This completely negates the effort to alleviate the constraints faced by firms and the country more generally. A key recommendation is therefore to drastically reduce (with a view to eliminating) restrictions on skilled foreign immigrants working in South Africa.

To put it another way, consider the following example: the United Kingdom allows people under the age of 28 that reside in the Commonwealth to spend two years working in that country. This enables UK firms to employ foreign labour, thereby alleviating their labour market constraints for unskilled and semi-skilled workers that are willing to work at a sufficiently low wage. South Africa's labour market constraints are the exact opposite: we need expensive, highly qualified workers. Consequently, we need to encourage them

to work here. It would be advantageous to facilitate an environment where there was a transfer of these skills within firms to local workers, but even if this did not happen, the productivity gains associated with the employ of foreign skilled workers would help raise the competitiveness of SA firms.

This raises the final recommendation concerning the need to focus on productivity as a critical component of the definition of skills shortages. When diagnosing occupational skills shortages, it is impossible to know whether the constraints faced by firms are binding in any way other than notional. This is a big part of the reason why the DOL can identify one set of numbers concerning skills shortages, and the DHA can identify a completely different number: the methodology is too arbitrary. Consequently, new information must be sought from firms in their Workplace Skills Plans, which should include a section devoted to productivity. Further research needs to be conducted on this, but one potential example is to ask firms that identify particular skills constraints to quantify the expected productivity losses associated with specific occupational skills shortages, and / or estimate the expected productivity gains that would be experienced should that skills shortage be alleviated.

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9. Appendices

Appendix 1: Managerial Competency Groupings in DYNA Training Survey

Competencies	
1.0 Communication Influencing Skills Media & Stakeholder Management Negotiation Skills Presentation Skills Communication tool usage Advisory Skills Business Writing Facilitation Skills	6.0 Business & Entrepreneurial Analytical Skills Business Acumen Business Metrics Company Policies & Procedures Competitor Analysis Financial/Resource Management Industry Knowledge Knowledge Management Organisational Understanding Project Management Scenario Planning Strategic Management Systems Thinking Action Orientation Budgeting
2.0 Personal Qualities Interpersonal sensitivity Excellence & Integrity Flexibility Resilience Personal Motivation Emotional Intelligence	7.0 Self Management Time Management Prioritising Technical Learning Stress Management Life Skills
3.0 Interpersonal Skills Persuasive ability Active Listening Conflict Resolution Cross Functional Teamwork Flexibility & Diversity Relationship Building/ Networking Assertiveness Company Vision & Behaviours	8.0 Leadership Competencies Provides clarity about strategic direction Ensures commitment Focuses on delivery Builds relationships Develops People Demonstrates personal conviction Builds self awareness Customer Service/Focus Responsibility & Accountability Systems Thinking
4.0 Results Orientation Action Oriented /Sense of Urgency Creative Problem Solving Decision Making Work Organisation / Priority Management Innovation Work Standards Quality Orientation Management Of Systems	9.0 Professional Competencies Specialist Knowledge Technical Knowledge Functional/Operational Knowledge Marketing Management Product Knowledge Sales Management
5.0 Managing People Change Management Coaching/Mentoring Conflict Management Consultation/Collaboration Counselling Delegation Developing People Managing Meetings Performance Management People Management Planning/Co-ordination/Organisation Staff Selection	

Source: DYNA Training (2003, 24)

Appendix 2: Scarce Skills by Main and Minor Occupational Categories, DOL: 2004-2009

Main occupational category (for 2004 - 2009)	Minor occupational category (for 2004 - 2009)
Senior Official & Management	Experienced and Qualified Managers • Project managers • Financial managers • Sales and marketing managers • General managers • Business leadership • Entrepreneurs
Financial E-commerce Specialist	Engineers, including • Mining • Agriculture • Chemical • Electrical • Mechanical • Electronic project • Civil • Design • Nuclear • Clinical Financial specialists, including • Chartered Accountants • Auditors • Actuaries • Financial/business analysts/consultants/advisors Researchers, including • Marketing • Surveyors • Entrepreneurs
Technicians and Associated Professionals	Insurance Brokers Bookkeepers Sales workers Buyers Qualified ETD practitioners Technicians, including • Clinical • Phlebotomy • Medical • Water • IT • Electrical • Electronic • Aircraft • Mechanical • Entrepreneurs
Clerks	Debt Collectors Conveyance secretaries Administrative clerks
[Main occupational category (for 2004 - 2009)]	Minor occupational category (for 2004 - 2009)
Service/shop/market sales workers	Qualified Recruitment Specialists Sales personnel Fire fighters Traffic officers Police officers
Skilled Agriculture & Fishery Workers	Skilled Horticulture Workers Maintenance Personnel
Craft & Related Trade Workers	Electricians Plumbers
Plant / Machine Operators	Taxi Drivers Machine Operators Plant Operators

Source: DOL (2005, 56-57)

Appendix 3: List of “Scarce and Critical” Skills Published by DHA, and Number of Individuals Required in Each Occupation

SPECIFIC OCCUPATIONAL CATEGORY	APPLICABLE QUOTA
1. Science and Engineering, Professionals and Associate Professionals.	
Aeronautical Engineers	500
Aircraft maintenance Engineers	500
Autotronics: Vehicle diagnostic technicians	500
Avionic Engineers	250
Chemical Engineers including Rubber & Plastic	100
Construction/ Civil Engineers	5000
Design and Engineering: Piping and pipe laying	500
Electronic Radio Frequency and Signal Engineers. Microwave and Satellite engineers.	500
Geologists	100
Astronomers	200
Astrophysicists	200
Atmospheric physicist	200
Surface physicist	200
Space Scientist	200
Geophysicists	150
Industrial Engineers	5000
Jewellery Designers	250
Mechanical Engineers including pressure vessel and stress analysis	1000
Metallurgical Engineers including material processes and development; Metrologists	250
Mining: Rock and Colliery Engineers	100
Aircraft maintenance technicians	1000
Architectural Technicians	1000
Aviations technicians (Aviation specific design and machining technologies)	1000
Dimensional Controllers	100
Earth Sciences Technicians	250
Electrical Mechanical including instrumentation	1000
Electronic technicians: Silicon and Microchip developers	1000
Foundry metallurgists	500
Hydraulics and Pneumatics Technicians	1000
Industrial/ Product development technologists	1000
NDE Technicians	500
Tool designers including Millwrights, Melters, Coded Welders and Moulders.	3000

Continued on following page...

2. Education Professionals	
Maths and Science Teachers	1000
3. Information Technology Professionals	
Software Developers	1500
Software Engineers	1500
ICT Security Specialists including Dimensional Controllers	1000
4. Health and Medical Sciences Professions	
Biological Science Technician	3000
Bio-informatics	1000
Biomedical Engineers	1000
Combinatorial and Computational Chemistry	150
Research and Development: Pharmacologists	300
5. Agricultural Sciences	
Agricultural Economist (Econometrics)	500
Agricultural Engineers including Farm Irrigation System Engineers	1000
Agricultural Extension Officers: Technology focused	1000
Agricultural Statistics: Biometrician, Crop Modeler	1000
Agricultural Biotechnologists, Genetic Markers and Promoters	1000
Virologists	250
Oenologist/ Viticulture	350
Genetists plant breeders	1000
Pasture Scientists	500
Plant Pathologists	1000
Food Safety Quality Assurance Specialists	500
Veterinarians	500
6. Management and Commerce Professions	
Actuaries	500
Financial Market Analysts	500
Risk Managers	500

Source: DHA (Government Gazette, 08 February 2006)