



LABOUR MARKET
INTELLIGENCE PARTNERSHIP 2012-2018

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**SKILLS PLANNING
FOR THE POST-SCHOOL
EDUCATION AND
TRAINING SYSTEM**

UPDATE 2018

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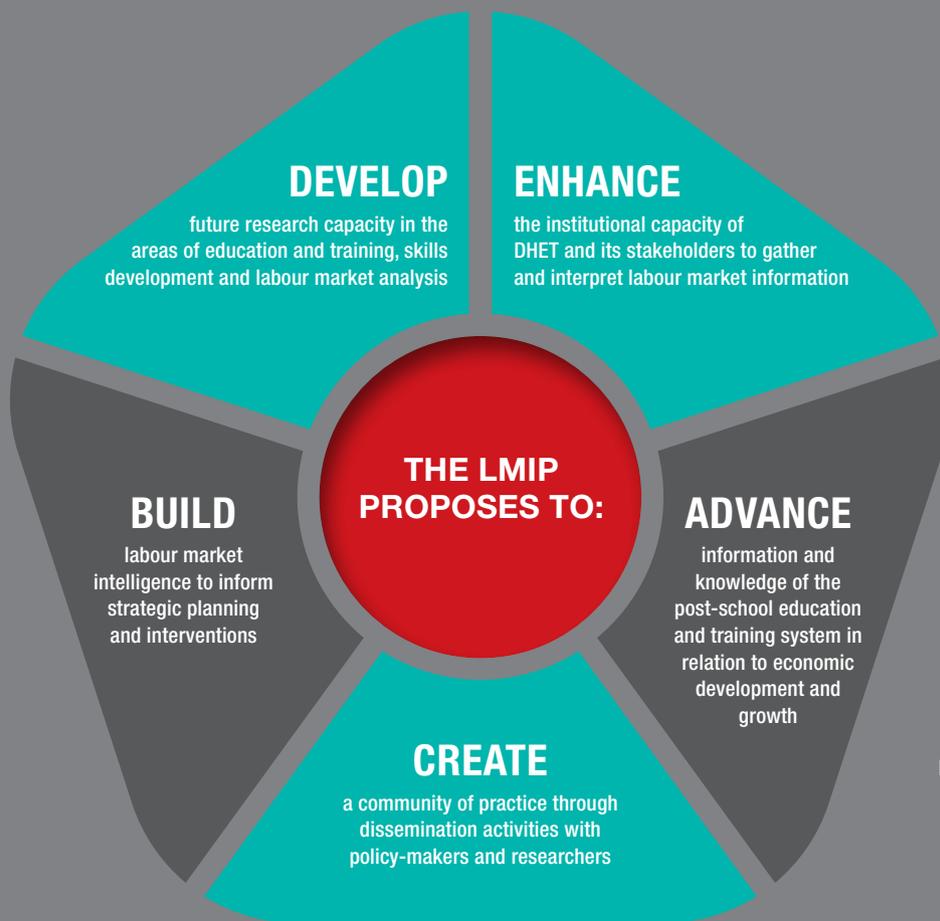
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About the Labour Market Intelligence Partnership (LMIP)

The **Labour Market Intelligence Partnership** is a collaboration between government and a national research consortium that aims to establish a credible institutional mechanism for skills development in South Africa.

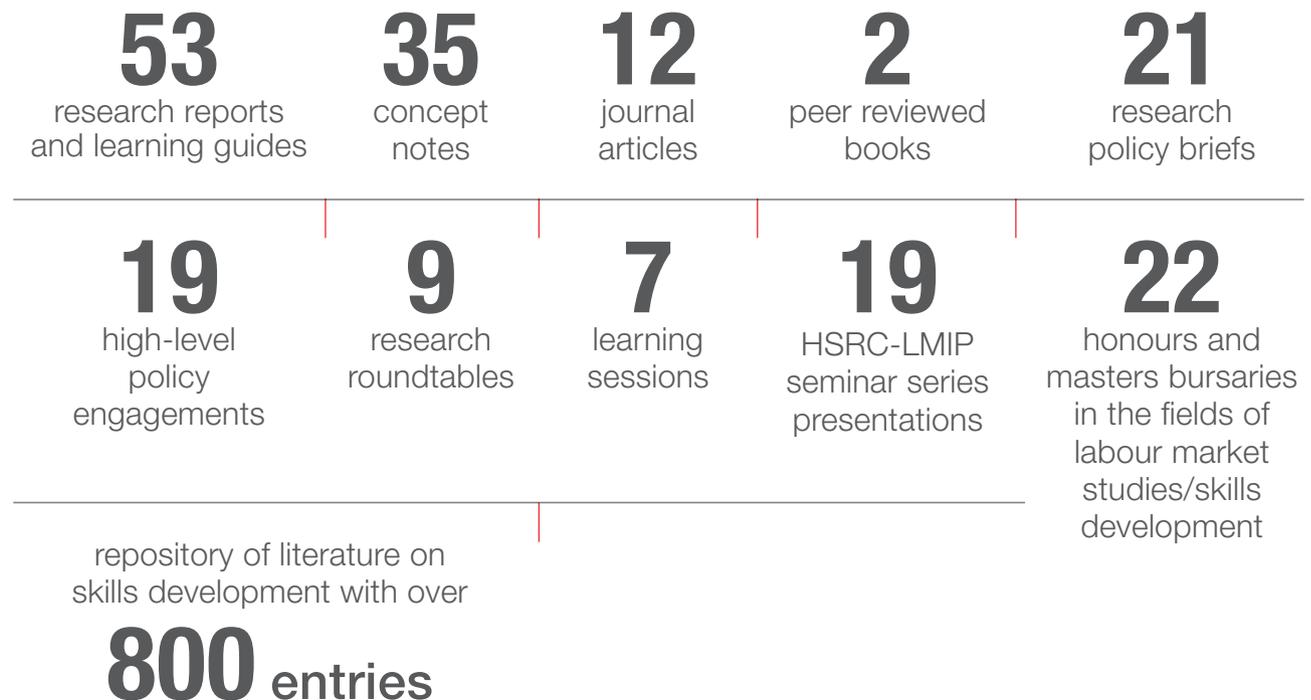


The Department of Higher Education and Training (DHET) contracted the Human Sciences Research Council (HSRC) to lead the research consortium in support of the goal of establishing a mechanism for skills planning.

The Labour Market Intelligence Partnership (LMIP) Project is a unique partnership between the South African government and the research community designed to generate strategic information and intelligence for skills planning. This partnership represents one of the largest global research investments relating to skills planning.

In the period 2012 to 2018, the LMIP generated knowledge, information and strategic intelligence; disseminated the research findings to a number of stakeholders and actors; and supported the training of postgraduate students in labour market studies.

The research outputs are to be found on our website: lmip.org.za and are summarised in the overview document, *Labour Market Intelligence Partnership: LMIP 2012 to 2018* (lmip.org.za)



Message from the Director-General, Department of Higher Education and Training

It is not always easy to manage a project of this nature. From the perspective of the Department of Higher Education and Training (DHET), it required the involvement of many players from the post-secondary education and training (PSET) sector, and, often, it was difficult to bring senior players into the space. Furthermore, we need to admit that the interests of researchers often do not coincide with those involved in policymaking, and, therefore, the research-policy nexus becomes a contested space. Nonetheless, despite the bumpy ride, we are of the view that the Labour Market Intelligence Partnership (LMIP) has set a good foundation for taking forward the research on labour market intelligence and has since created synergies between the work of the DHET and the research generated through the LMIP.

In 2013, when the LMIP had just started its work, many of us did not know what 'labour market intelligence' really meant; many of us did not know what kind of information we needed for skills planning; and many of us are still not sure what good skills planning means in practice. However, we will continue to learn, and develop and identify areas where we need more information in order to understand the relationship between skills supply and demand.

The LMIP has produced many research reports, research papers and journal articles, as well as tools for skills planning.

Many of the research outputs are valuable to South Africa from a comparative international perspective. The DHET will therefore continue to draw on the LMIP's research and share it in formats that are easily digestible.

The DHET has found reports such as those on skills supply and demand, occupational shifts and shortages, occupations in high demand (OIHD), and graduate destinations from technical and vocational education and training (TVET) colleges and universities to be helpful in its day-to-day work. In addition, the tools and methodologies used/developed through the LMIP Project will be helpful in taking the work in respect of labour market intelligence forward. The LMIP has also provided useful insights into international approaches to skills planning, and has provided thorough explanations of indicators that can be used for skills planning.

Another positive outcome of the LMIP Project has been the development of the community of practice on skills planning among the DHET, the sector education and training authorities (SETAs), the Department of Labour, the Department of Trade and Industry, the National Treasury, and professional and employer bodies. This community of practice occurred through many policy roundtables, learning sessions, seminars, and other kinds of events, such as a one-day workshop with the Economic

Cluster and presentations to the Parliamentary Portfolio Committee.

Additionally, the DHET is glad to have a well-resourced research repository which provides access to a large volume of research, not only on the LMIP but on PSET in general – and I urge everybody to access this website.

I would like to thank all the organisations which have participated in the journey towards establishing a credible institutional mechanism for skills planning. A special thank you to the Human Sciences Research Council (HSRC), under the leadership of Dr Vijay Reddy, for its considerable expertise and knowledge put into managing this project.

Mr GF Qonde

Director-General: Department of Higher Education and Training

[Minister Nzimande] went on to say:
'This [LMIP] research project will be key to providing the information and labour market analyses required for aligning the economic and industrial priorities of the country with the education and training outputs required to support them.'

Message from the Labour Market Intelligence Partnership Project Leader

In September 2012, when Minister Nzimande launched the Labour Market Intelligence Partnership (LMIP), he stated: 'The LMIP research project marks an important step in contributing towards the creation of a credible labour market intelligence framework and the establishment of a functional interface that will ensure better information gathering, analysis and overall systems synergy in pursuit of an agenda that is developmental, forward-looking and embedded in empirical analysis.' He requested the Human Sciences Research Council (HSRC) to conduct appropriate research in order to provide a scientific basis to 'set up systems for reliable data indicating skills need, supply and demand in our labour market in a manner that will enable our country, including government and business, to plan better for [our] human resources development needs'. He went on to say: 'This [LMIP] research project will be key to providing the information and labour market analyses required for aligning the economic and industrial priorities of the country with the education and training outputs required to support them.'

In the six years of the LMIP, we conducted a number of research studies to understand, in a deeper and more nuanced way, the supply of, and demand for, skills and the extent to which supply responds appropriately to demand. Our research studies, both quantitative and qualitative, focused on institutions and individuals and on ways in

which both would be connected. Our approach was to build on, adapt and consolidate what we already had, rather than starting afresh. We reviewed past South African and international practices and drew out lessons that could be applied to establish the skills planning mechanism.

We had extensive engagements with the relevant directorates in the Department of Higher Education and Training (DHET), and then through a series of roundtables with other government departments, sector education and training authorities (SETAs), academic institutions, and business and professional institutions. These policy roundtables were a useful forum in which to share, debate and engage with one another so that we strengthen the research. As South Africa formalises the skills planning mechanism, it is clear that much has been achieved and that we need to continue to strive for greater coordination and coherence of what we have; to disseminate the findings to relevant stakeholders and actors; and to move towards implementing the lessons in order to establish the skills planning mechanism.

Skills planning is a complex exercise. On the one hand, we need to understand the statistical aspects related to the economy, and skills demand and supply. On the other, we need to understand the contours and capabilities of institutions that make them act in particular ways; the responsiveness

of education and training institutions to the changing demands from firms and workplaces; the changing nature of work and workplaces; the response of the labour market to graduates; and the dynamics that shape individual behaviours.

The LMIP is unique in the scale and scope of the research as well as the nature of the collaboration between government, in particular the DHET, and the research community. It was a learning experience for both researchers and government to negotiate working in the research-policy nexus. The research-policy nexus is studied in the academic literature and many of our international colleagues were envious that LMIP researchers were offered the opportunity for this close engagement with policymakers. In South African tradition, with its robust and activist democracy, debates were loud and intense as we sought to find common understandings. We are pleased to note that the LMIP established its mark in the skills development and planning arenas, both locally and globally. The LMIP has become synonymous with skills planning, and the research generated from this partnership is the first point of call for anyone involved in skills planning or skills development.

A project of this nature involves a team of researchers, and appreciation must therefore be expressed to the research leaders (Dr Marcus Powell, Dr Asghar

Adelzadeh and Dr Peliwe Lolwana, Prof. Haroon Bhorat, Dr Glenda Kruss, Prof. Mike Rogan and Dr Angelique Wildschut) for their leadership in their respective themes of research. A number of researchers were involved in the study (see pages 45 to 47), and your contribution is much appreciated. A word of appreciation goes to Dr Olive Shisana, the Chief Executive Officer of the HSRC in the initial years of the study, for her leadership and support in the earlier years of the collaboration.

The HSRC and the LMIP team would like to express their appreciation to: the DHET for entrusting this important study to us; each of the Ministers who supported the research work (Ministers Nzimande, Mkhize and Pandor); DG Qonde for always being a friend of the LMIP; the late DDG Patel, whose intellectual and policy guidance regarding the research was invaluable in shaping the direction of the LMIP; Dr Narsee, Ms Mampho Khuluvhe and Ms Ramasoadi for their support; all DHET officials who worked with us; the SETA colleagues who engaged with the research; and all other social partners who walked the journey with us.

This LMIP Update 2018 provides a consolidated summary of our research that we conducted and suggests how this labour market information and intelligence could be used to establish the skills planning mechanism. We hope that these research findings are implemented and contribute to enhancing skills development in this country.

Dr Vijay Reddy, LMIP Project Leader

Distinguished Research Specialist,
Human Sciences Research Council

Skills planning in South Africa from 2009

The Labour Market Intelligence Partnership (LMIP) Project is a unique partnership between the South African government and the research community designed to generate strategic information and intelligence in order to enhance skills planning. This skills planning story begins in 2009 when, in the Medium Term Strategic Framework (MTSF), government outlined 12 key outcomes with accompanying outputs and activities to guide its strategic delivery. Priority Outcome 5 was to establish a skilled and capable workforce to support an inclusive growth path, with the Department of Higher Education and Training (DHET) as the lead government ministry. Outcome 5 included the delivery of Outcome 5.1.1, namely to 'establish a credible institutional mechanism for skills planning'.

In order to achieve Outcome 5.1.1, the DHET collaborated with the Human Sciences Research Council-led consortium (comprising the HSRC, the University of the Witwatersrand, and the University of Cape Town) to provide the evidence-based recommendations for establishing the skills¹ planning mechanism.

An engaged and productive society and economy are dependent on an educated, skilled and capable workforce. The apartheid state withheld education, especially mathematics education, in terms of its social engineering project for the underdevelopment of the majority of the population, that is, the African population. The devastating effects of these policies are still being felt today. However, the post-1994 government prioritised education, training, and skilling for personal, social and economic development.

Since 1994, there have been changes in legislation, policy, and institutional and resourcing structures and arrangements. Although there have been improvements in the education and skills levels in the country, the pace of these changes has been slow and the competences gained are not necessarily resonant with the skills needed by society and the economy. In addition, despite the political and policy intentions, interventionist legislation, and active labour market policies and strategies, the levels of poverty, inequality and unemployment in South Africa continue to remain high and, alarmingly, are increasing.

Government must therefore anticipate, and plan for, the types of education and skills required to support current and future economic development and the needs of society.

¹ We use the term 'skills' to encompass education, training and skills development in both education and training institutions and in the workplace.

1. What is skills planning and why is it important?

An appropriate skills development strategy is key for the growth of an *inclusive* and *productive* economy in South Africa. Skills development primarily occurs through the acquisition of qualifications or through participation in (certificated and non-certificated) training on or off the job.

Since 1994, there have been significant efforts in South Africa to plan for the skills needs of the country, but these efforts have been fragmented, and the performance of this skills planning mechanism imperfect, as evidenced by the continued skills shortages. There is, therefore, a need for a more coordinated, coherent, aligned and responsive skills planning system.

Skills planning involves addressing two separate but interrelated processes. The first pertains to the labour market information systems and processes associated with data collection, analysis, and the production of labour market intelligence. Most of the issues are technical and are concerned with research-based activities as well as a supportive information and communications technology (ICT) infrastructure. The second relates to how stakeholders and actors work together to estimate skills needs and to foster alignment between industrial strategies, government growth initiatives, societal needs, and the skills strategy. The skills planning mechanism includes the structures that facilitate the joined-up approach among institutions, as well as policies to facilitate the coherence, coordination, alignment and integration of the data and information. This mechanism is then used to steer the skills strategy, including institutional arrangements, and to improve policy coordination so that the processes, systems and resources are managed effectively in order to achieve positive outcomes.

Investment in establishing a credible skills planning mechanism for South Africa is important for a number of reasons. These are, inter alia:

- ➔ To provide a better understanding of skills supply and demand, especially as regards skilled and semi-skilled occupations (this information can then be used to plan the size and shape of the post-school education and training system: enrolment planning, new programmes, workplace training, and the infrastructure investment needed);
- ➔ To provide credible information in order to direct government resources at developing skills where people are likely to get jobs, thereby tackling unemployment;
- ➔ To support government's economic development strategy and target resources at education and skills areas in most need, thus tackling skills shortages;
- ➔ To improve South Africa's competitiveness and to support improved social cohesiveness, as well as contribute to poverty alleviation; and
- ➔ To provide information for learners to make career decisions.

2. The Labour Market Intelligence Partnership Project

The LMIP organised its work into six interlocking research themes.

TABLE 1: LMIP research focus	
Research theme	Research focus
1. Establishing the foundation for labour market information systems in South Africa <i>Vijay Reddy (HSRC) and Marcus Powell (Centre for Employment Initiatives, UK)</i>	<ul style="list-style-type: none"> • The architecture for skills planning: Approach, structure, governance • Skills planning information framework: Indicators, data and data sources • Skills supply, demand and mismatch in South Africa • Occupations in high demand in South Africa
2. Skills forecasting: Modelling future demand for, and supply of, skills in South Africa <i>Peliwe Lolwana (Wits University) and Asghar Adelpzar (Applied Development Research Solutions, USA)</i>	<ul style="list-style-type: none"> • Developing a linked macro-education model for South Africa to generate projections of supply of, and demand for, skills in the economy under different 'what if' scenarios of the economy, the labour market, key external drivers and key policy changes
3: Studies of selected priority sectors: Nexus between economic growth and the role of skills <i>Haroon Borhat (UCT)</i>	<ul style="list-style-type: none"> • Skills-biased employment demand (nature of skills-biased employment trends, role and impact of human capital accumulation, and role of institutions in predicting labour market outcomes) • Growth, employment and skills: The NGP revisited • Employment creation through the informal sector • SETA labour market survey: A primer for an enterprise survey
4. Alignment between the PSET sector and the labour market <i>Glenda Kruss (HSRC)</i>	<ul style="list-style-type: none"> • Labour market interactive capabilities, structures and mechanisms in different PSET institutional settings • Curriculum responsiveness and student employability in the vocational education and training curriculum
5. Multi-cohort tracer studies on access, progression, graduation and labour market destinations along education, training and labour market trajectories <i>Mike Rogan (Rhodes University)</i>	<ul style="list-style-type: none"> • Piloting new student tracer studies to explore the questions for different sectors: University, TVET, adult education and training, and secondary school • Assessing the usability of existing data sets to explore the questions: NSC-HEMIS linked data set, the National Income Dynamics Study, Western Cape Graduate Destination Survey, SETA administrative data • Using the South African Social Attitudes Survey to measure public attitudes to work
6. Changing occupational milieus and identities: Focus on artisanal work and training <i>Angelique Wildschut (HSRC)</i>	<ul style="list-style-type: none"> • History of artisanal skilling and employment • Shifting boundaries between artisanal work and other occupational groups • Work and qualification futures for artisans and technicians

3. LMIP Update 2018

The purpose of LMIP Update 2018 is to provide a summary of the research findings and to make recommendations concerning the establishment of the skills planning mechanism. We have organised the LMIP Update into two main sections:

1. The contours of a skills planning mechanism: This section provides the architecture and foundations for the skills planning mechanism in terms of an approach, structure, governance, data and information, and key skills planning reports; and
2. The strategic intelligence to plan for skills: This section serves to anticipate and plan for skills needed and will report on our research which provides nuances at the macro-, meso- and micro-level.

The recommendations regarding skills planning must be viewed with caution, for they are not a recipe. Rather the planning exercise must be viewed as a compass to give a sense of direction as to where things will be, as opposed to a GPS that tells policymakers what to do at every crossing.

The contours of a skills planning mechanism

In this section, we discuss the foundations and architecture for the skills planning mechanism in terms of the approach, institutional structure, governance arrangements, and the skills planning information framework, together with the indicators and data (existing administrative and survey data as well as proposed new data sets) needed in order to produce key skills planning reports.

4. The foundation for skills planning information systems in South Africa²

In high-income countries with high levels of education and skills and low levels of poverty and unemployment, skills planning involves a detailed analysis of the demand for skills in the workplace. This demand may be due to the changing nature of work or to the introduction of new and changing technologies. Where there are skills gaps, policy responses include skills upgrading, retraining, improved levels of education, or importation of skills.

For emerging-economy countries with tepid economic growth, high unemployment rates and low levels of education and skills, skills planning is more complex. It involves all levels of the education system and

requires a nuanced understanding of: the structure and history of the society and the economy; the growth trajectories of the economy; and the changing nature of work. In addition, given South Africa's historical legacy of apartheid and exclusion, skills planning must include the transformation imperatives necessary to change the levels of inequality and facilitate an *inclusive* growth path.

The information, analyses and strategic intelligence obtained through such a multipronged approach to skills planning will provide the signals for appropriate education and training provisioning at all levels of the education system as well as in respect of the workplace. From our research, we propose the following in order to establish the credible mechanism for skills planning.

4.1 Approach to skills planning

Countries adopt different models of skills planning, ranging from the voluntary approach (where the market plays an important role in tackling skills shortages) to social partnership models (either state-led or social partner-led), to developmental-state approaches (in terms of which the direction of the economy informs skills policy), to comprehensive education, training and human resource development strategies in emerging economies (where skills planning includes

all levels of the education and skills system and there is close synergy with the economy as well as a recognition of the informal economy and the unemployed). We reviewed the experiences of a number of countries for policy lessons, namely the United Kingdom (UK), PRC Hong Kong, the Netherlands, the Republic of Ireland, Singapore, Sri Lanka, Botswana and Rwanda, and categorised these into four types:

1. The *education or market-based model*. This approach uses the formal education system as the main mechanism for skills development and is reactive to what the market requires. The countries that have adopted this approach include the United States of America (USA), Canada, the UK and the former Anglo-Saxon colonies. One of the characteristics of this approach is the key role played by the formal education systems in producing skills, as well as the high value placed on the collection of labour market data.
2. The *social partnership or employment approach*, which emphasises workforce development as the key vehicle for skills formation. This approach has been applied in the Netherlands, Scandinavian countries and the Republic of Ireland. The important role played by social partners, both in terms of identifying skills requirements and determining

2 Powell, M. and Reddy, V. (2014) *Information Systems and Architecture for Skills Planning: Lessons and Options for Reform in South Africa*. LMIP Report 9.

The contours of a skills planning mechanism *continued*...

which type of skills should be produced, could provide lessons for South Africa. Other facets of this model worthy of consideration are the collaboration between government departments on skills development, and the setting up of structures dedicated to producing labour market intelligence.

3. The *integrated economic approach or state intervention model* of skills formation, which focuses on demand-side policies and their role in the generation of higher-level skills. The best example of the state intervention model can be found in Singapore which has successfully generated synergies between trade and investment strategies, and those for skills development.
4. The *catch-up countries model*, where emerging middle-income economies like those of Sri Lanka and Botswana attempt to leapfrog stages of development using skills. These countries adopt a more holistic approach to skills and human resource development. One of the key lessons from this approach is the importance of: ensuring synergies between national macro-policy frameworks and those for skills development; a focus on all levels of the education and training system; and linking skills to employment (including the informal economy) and wider human resource development.

The South African skills planning approach must respond to the unique historical and political challenges faced by the country. Therefore, we propose an *inclusive socio-economic skills planning approach* which is embedded in the reality of the structural mismatch between labour demand and supply, in that the economy and labour market show a demand for high-skilled workers, but there is a surplus of low-skilled workers. Skills policy must respond to the needs of the formal and informal *economy* and of the vulnerable and unemployed in society. In this approach, the first challenge is to improve the quality and success rates in the basic and post-school education and training (PSET) systems. We know that 'skill begets skill', and the more skills you start with the more you will acquire. Thus foundational learning is critical. Secondly, we must identify the skills needed to support and grow a productive economy, and the PSET system must respond with programmes to develop these skills. Thirdly, the education and skills strategy must include a programme for skilling the unemployed; and, fourthly, workplace training must lead to improved job opportunities for all workers as well as the upgrading of skills to meet the changing needs of the workplace. Labour market intelligence will thus be informed by the signals of demand from the economy, government growth strategies, industrial policies, and societal needs. Government, with its partners, will

use this labour market intelligence to ensure better alignment with the skills strategy.

4.2 Establish a skills planning unit³

Government must establish a dedicated skills planning unit (SPU) with critical authority and resources to drive coordination and cooperation among government departments in order to estimate the skills needs of the country. The SPU should be located in the DHET and should work with other government departments and stakeholders to plan the skills needs for the country.

The SPU must be given adequate budgets as well as staff with labour market economics and planning skills who are able to make sense of the relevant knowledge in order to generate regularised policy supply and demand signals for informing the education, training and skills development direction.

3 Powell, M. and Reddy, V. (2014) *Roadmap for the Implementation of a Skills Planning Unit*. LMIP Report 10.

4.3 The architecture, governance and actors for skills planning⁴

The skills planning mechanism requires alignment and coherence between national development and education and training institutions and firms. Thus a joined-up approach to skills planning will underpin the credible and effective skills planning mechanism. Figure 1 provides an overview of what the skills planning mechanism could look like. The overview highlights the relationships among the different organisational structures involved in the skills supply and demand process, and the type of plans that should be produced. Within this planning process emphasis will be given to a top-down and bottom-up approach to skills planning.

In this configuration, the National Planning Commission (NPC) and the Cabinet will be at the top of the planning mechanism. The NPC has produced the National Development Plan (NDP) and it can be expected that the NPC, through the Department of Planning, Monitoring and Evaluation (DPME), would be responsible for validating the content of any national skills plan and ensuring that there is more coordinated or 'joined up' thinking among government departments.

4 Powell, M. and Reddy, V. (2014) *Information Systems and Architecture for Skills Planning: Lessons and Options for Reform in South Africa*. LMIP Report 9.

Below the NPC and the NDP are a number of existing structures involved in planning at the macro-level and national level. Any future national skills strategy must consider the implications of broad macro-level plans, ensuring close synergies between trade and investment strategies, and those for skills development.

At the national level, and within the DHET, the SPU together with the National Skills Authority (NSA) will play an important role with regard to tracking major growth initiatives being implemented by other government departments, as well as other changes in the economy, and identifying their implications for skills development.

The core of the planning process will continue to be focused on the sector education and training authorities (SETAs) and PSET providers. The SETAs must continue to focus on managing skills supply and demand at the sector level. The SETA Sector Skills Plans (SSPs) must be streamlined and produced in accordance with government planning cycles. This process will involve a much closer working relationship between the SPU and the NSA. Specific responsibilities of the SETAs will focus on identifying skills needs and on working more closely with providers to ensure that appropriate responses occur, particularly around the development and delivery of programmes. Employers will also need to play a more active role in this

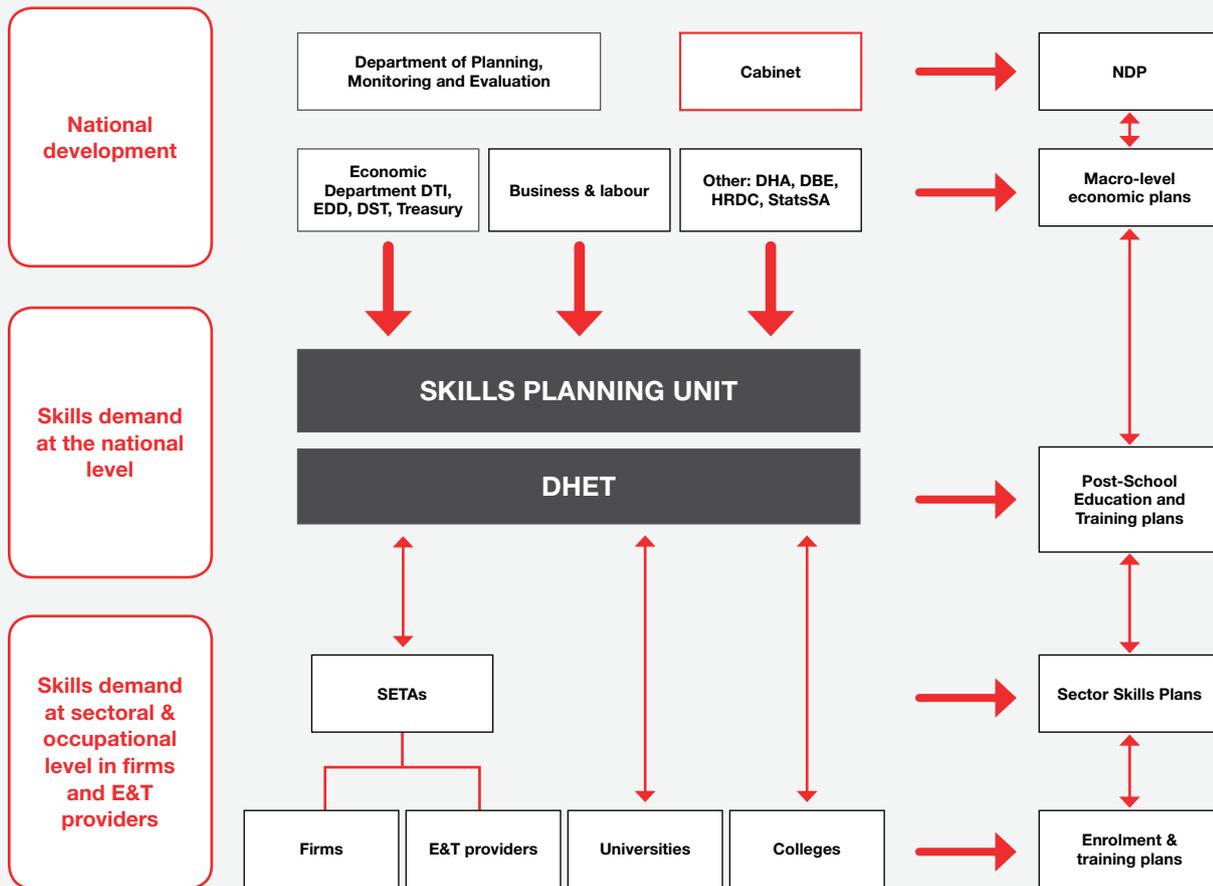
process, especially with regard to confirming priority skills areas and corresponding strategies for implementation (supply).

In addition, the SPU together with the NSA will play an important quality assurance role in validating the SSPs produced by the SETAs so as to ensure that they are aligned to national plans and priorities, including emerging ones when they occur. This will be achieved through a number of new strategies:

- The SPU must conduct a national enterprise survey to determine the priority skills needs at the level of the firm. The information from this survey would be used by the NSA to validate the plans from the SETAs, particularly around whether all the national priority skills needs are being addressed by the SETAs and whether there are duplications in provision.
- The SPU will conduct surveys of skills needs of the unemployed and those in the informal sector.
- Where national priorities are missed and where potential duplications in supply may occur, the SPU and the NSA could intervene and ensure that corrective actions take place within the plans of the appropriate SETA.
- The SPU will also inform the NSA about those priority skills areas that take a long time to develop, thus providing the basis for ensuring that education and training providers deliver such programmes.

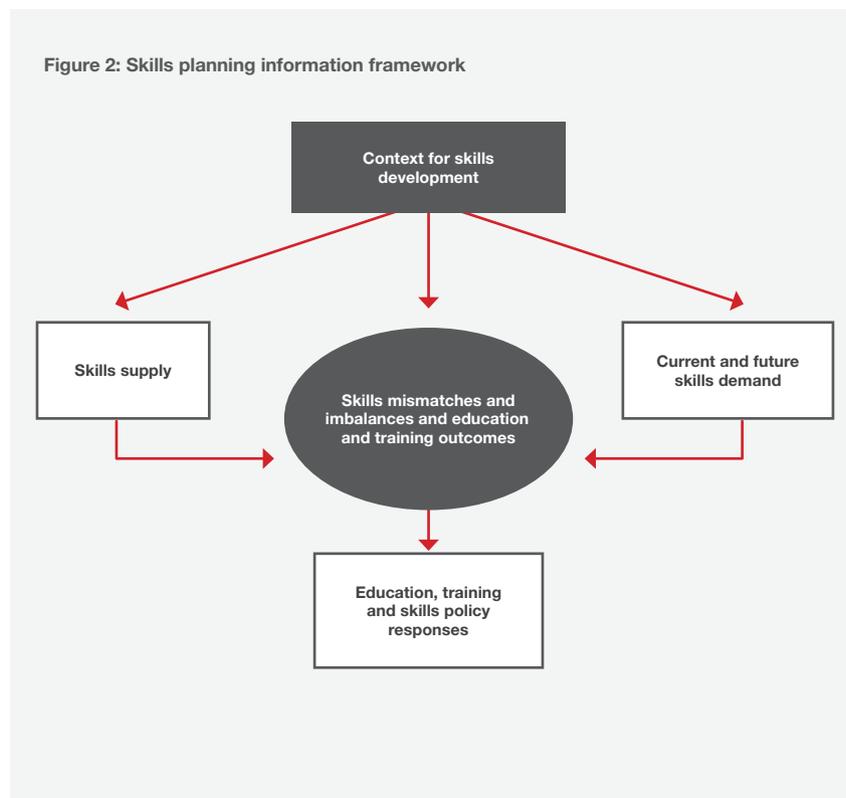
The contours of a skills planning mechanism *continued*...

Figure 1: The skills planning architecture and processes for decision-making



5. The skills planning information framework

For effective skills planning, we need valid, relevant, credible and up-to-date information on skills and the labour market. From our reviews and engagements, we propose the following skills planning information framework (Figure 2). The framework points to the key areas of information needed for skills planning. The analysis of this information provides the strategic intelligence to inform the size and shape of the PSET system, including the workplace training system.



The skills planning information framework (SPIF) informs the selection of a set of skills indicators which will provide signals and labour market intelligence required for skills development decisions. From the SPIF, we identified the following indicators for each of the key areas of information:

- The context in which skills development takes place, using the indicators of economic performance, demographic changes in the population, and the profile of the labour force;
- An estimate of skills demand (present, replacement and future), measured using changes in the structure of employment and occupations;
- Skills supply, measured using the possession of qualifications in order to identify the types of skills people acquire when they move through to the labour market;
- Skills mismatches and imbalances by means of an analysis of scarce and critical skills and occupations in high demand; and
- The education and training labour market outcomes for the different institutional sectors and programmes: schooling, technical and vocational education and training (TVET), higher education, artisanal training, community colleges, workplace learning, and those not in education, employment or training (NEET).

The contours of a skills planning mechanism *continued...*

5.1 Indicators and data⁵

The success of the indicator values is dependent on having credible data for analysis. Supply-side data would be obtained through analysis of the following: the Department of Basic Education's (DBE) Education Management Information System (EMIS); the Higher Education Management Information System (HEMIS); the Technical and Vocational Education and Training Management Information System (TVETMIS); the skills sets of the unemployed; those allocated work permits; and workplace training data.

Demand-side data collection and analysis are more complicated and have been a major focus for the Labour Market Intelligence Partnership (LMIP). Demand-side data would be obtained from an analysis of job vacancies, workplace training plans, and data from Statistics South Africa (Stats SA) on the occupational structure of the labour market.

Table 2 lists the key areas of information needed for skills planning, the indicators associated with these key areas, and the data needed to make the relevant calculations.

5 Reddy, V. and Powell, M. (2015) *Indicators and Data to Support Skills Planning in South Africa*. LMIP Publication.

5.2 Data sources

As noted in Table 2, for many of the indicators from the SPIF, we propose using existing administrative data. However, there are some indicators where suitable information is not available. Thus we propose a new enterprise survey for training data and a model and to forecast future skill needs.

5.2.1 Administrative data sets⁶

Government collects periodic administrative information and the appropriate data could be analysed to provide skills planning intelligence. The LMIP conducted a high-level strategic audit of administrative databases across all government departments. The aim was to identify a selection of relevant and high-quality data sets that could be coordinated and linked into a database system to support more sophisticated labour market analysis. From the audit of the databases, we created four categories of data sets in terms of their relevance and usability. The SPU must work with other government departments to strengthen their data sets.

5.2.2 New data set: Enterprise survey

The key sources of data for skills planning are the firm and employee-training surveys. There is a major gap in the currently available labour market data sets in South Africa in terms of their ability to analyse skills demand and training supply in a more nuanced way. The SETA system has been

6 Paterson, A., Visser, M., Arends, F., Mthethwa, M., Twalo, T. and Nampala, T. (2015) *High-Level Audit of Administrative Data Sets*. LMIP Report.

hampered in its delivery of WSPs and SSPs to government by the lack of a granular, high-quality, analytical and statistical information base.

The LMIP piloted a survey, through the Mechanical, Engineering and Related Services SETA (MerSETA), collecting detailed training and labour market information from firms within this sector. This survey provides an exemplar of the process and instrument,⁷ and the information collected is directly relevant to the labour market in which the SETA operates. The survey was conducted with 6 400 employees in 240 firms, and training data was obtained from 690 firms. The survey is designed to collect baseline data about the employee profile in each firm (including employees' current qualifications, job titles, and wage levels), as well as the nature of the education and training provided (including the type and name of the programme, and its duration). Critically, the data is collected per employee, which allows for more meaningful insights. The survey collects firm-level information on: (a) the rationale for training; (b) the institutions where training takes place; (c) the factors that have enabled and hindered training; (d) training expenditure; and (e) the level of engagement with the SETA. This pilot survey can provide accurate and detailed skills planning and provision information for use in SSPs.

7 Cassim, A., Naidoo, K., Pillay, F. and Steenkamp, F. (2016) *SETA Labour Market Survey: Case Studies of Firms' Experiences*. LMIP website; Oosthuizen, M. (2018) *Analysing the Proposed Workplace Survey*. LMIP website.

Table 2: Key areas of information, indicators, and data sources for skills planning

Key areas of information	Key indicators	Data sources
Context for skills planning	<ul style="list-style-type: none"> Economic drivers (GDP, exports, investments) Demographic changes 	<ul style="list-style-type: none"> StatsSA, National Treasury DHA population estimates*
Current skills demand	<ul style="list-style-type: none"> Sector and occupations where people are employed Skills gaps (critical skills) Skills shortages (scarce skills) Changes in industry average earnings (%) Stock of job vacancies Hard-to-fill vacancies Global demand 	<ul style="list-style-type: none"> StatsSA Enterprise survey# Enterprise survey# StatsSA Job Opportunity Index (DoL)* StatsSA, enterprise survey# Global surveys plus visa lists of other countries
Replacement demand	<ul style="list-style-type: none"> Personnel turnover Mortality rates Retirement of workers Emigration rates 	<ul style="list-style-type: none"> Enterprise survey# DHA population estimates* Enterprise survey DHA to develop standardised methods to measure skills outflow#
Future demand	<ul style="list-style-type: none"> Changes in population Projections of economic growth and skills needed Skills forecasting: Modelling future demand Government growth priorities and its skills needs Potential new business and its skills needs Newly established businesses and their skills needs 	<ul style="list-style-type: none"> DHA population estimates*, StatsSA National Treasury Forecasting Model MEMSA (Wits and ADRS) Identification of the growth plans dti dti's Companies and Intellectual Property Commission (CIPC)
Skills supply: Stocks and flows	<ul style="list-style-type: none"> Grades 9 and 12 pass rates Enrolment and graduation rates at universities Enrolment and graduation rates at TVET colleges Immigration rates Workplace skills development 	<ul style="list-style-type: none"> DBE & EMIS HEMIS TVETMIS* DHA data systems* Workplace Skills Plans (WSPs)*
Education and training outcomes	<ul style="list-style-type: none"> Number who complete the National Senior Certificate Percentage of students following different post-Grade 9 pathways Number of 18- to 34-year-olds that are NEET Change in participation and graduation in TVET system Labour market outcomes of graduates from TVET institutions Change in participation and graduation in HE system Labour market outcomes of graduates from HE institutions Number graduated in occupational programmes linked to artisanal trades Labour market outcomes of graduates from artisanal programmes Impact of CET training grants Number benefiting from learnership programmes and grants for skills training in the workplace Labour market outcomes of graduates from learnership programmes Changing educational level of post-secondary instructional staff 	<ul style="list-style-type: none"> DBE South African Youth Panel Study/NIDS GHS and QLFS* TVETMIS* Institutionalise pilot tracer study HEMIS Institutionalise pilot tracer study HETIS artisanal data* Establish a tracer survey for artisans# Institutionalise pilot survey on AETs Administrative data Institutionalise pilot tracer study Template for university and TVET colleges to complete*

New data sets

* Data sets that need to be strengthened

The contours of a skills planning mechanism *continued*...

Table 3: Relevance and usability of administrative data sets

Relevance and usability of administrative data sets for skills planning	Examples of the data sets
Relevant and immediately usable	Quarterly Labour Force Survey, Quarterly Employment Survey and General Household Survey from StatsSA
Highly relevant but require some preparation	Unemployment Insurance Fund database from the Department of Labour
Currently undergoing validation and cleaning before they can be utilised	The population register in the Department of Home Affairs
Early stage of evolution and require further development before they can be used	The new farmer database in the Department of Agriculture, Forestry and Fisheries

Subsequent to the survey, the LMIP conducted case studies in four firms to understand how the data was generated and used. The case studies provided a deeper understanding of the systems, the human resources, and the time necessary to answer the questionnaire and to understand the practical, administrative and technical issues that arose in collecting the data.

5.2.3 Skills forecasting: Modelling future demand for, and supply of, skills

Regular, coherent, credible and systematic forecasts of demand for, and supply of, skills are an important resource to inform and improve the responsiveness of the PSET system to the needs of the economy and society. The Wits University REAL Centre–ADRS collaboration explored building a skills forecasting tool, the Linked Macro-Education Model (LM-EM), for South Africa.⁸ Such foresight exercises could

8 Asghar, A. (2017) *Modelling Future Demand and Supply of Skills in South Africa: A Technical Report and Ten-Year Forecast*. Report prepared for the DHET, Pretoria. <http://www.dhet.gov.za/Commissions%20Reports/Modelling%20future%20of%20demand%20and%20supply%20of%20skills%20in%20south%20Africa/Modelling%20future%20demand%20and%20supply%20of%20skills%20in%20South%20Africa.pdf>.

provide insights about the possible future paths of the economy as well as projections in respect of the labour force, job openings, and employment and unemployment by qualification under alternative ‘what if’ (low, medium and high) scenarios.

The LM-EM combines economic, demographic and education data with statistical and modelling techniques in order to capture key interactions and interdependencies within the economy, including the behaviour of households, the private sector and government, and the links between the labour market and the education sector, so as to forecast skill needs. The approach involved six steps:

1. Producing projections of future demand for labour in the economy and its sectors using the ADRS forecasting multisector macroeconomic model for South Africa;
2. Using historical data and statistical methods to analyse occupational, qualification and replacement demand for, and supply of, educational qualifications;

3. Constructing computer modules that link the macro-model's annual projections of future sector demand for labour to corresponding demand for occupations and educational skills;
4. Researching the supply of skills from the education and training sector and building computer modules for projecting the supply of skills;
5. Building a computer module for comparing the model's skills demand and supply projections in order to provide predictions and estimates of possible labour market imbalances and skills mismatches; and
6. Establishing a tested and validated, linked macro-education model that captures the dynamic interaction between the macroeconomic model and its education components in order to produce current and future projections of demand for, and supply of, occupations and educational skills.

The main sources of data for the LM-EM model included the South African Reserve Bank's historical National Income and

Product Account data set and Quantec's industry database (based on StatsSA data). Additional data sources included: the 10% Census 2011; population data; pooled Quarterly Labour Force Surveys from 2009 to 2011; Quarterly Labour Force Surveys from 2008 to 2015; education data; and the OECD (Organisation for Economic Co-operation and Development) data set on international migration.

Working on the basis of low, moderate and high macroeconomic growth at annual rates of 2%, 3.55% and 4.38%, respectively, the model forecasts that, as the workforce grows over the next ten years, there will be an expansion of the proportion of management and professional jobs compared with unskilled and semi-skilled jobs, and that there will be a reduction of jobs in the primary sector as a proportion of total employment. The greatest potential for employment growth is in construction, health services, manufacturing, wholesale and retail, and the hospitality and tourism sectors. Given the expanding number of low- or semi-skilled people entering the labour market and the expected expansion in higher-level jobs, the current situation of expanding unemployment among low-skilled people will continue.

While economic modelling and forecasting constitute an important component of skills planning, the range of information normally used for planning education and training is much broader and diverse than the information that is produced using economic modelling techniques. Models such as the LM-EM uniquely complement

other inputs to labour market intelligence and decision-making by providing quantitative projections. The intelligence provided by the model for decision-making depends on specific circumstances, but is useful for providing tactical and strategic intelligence at the macro-level for policymakers. Projection and forecasting models should be treated as indicative only, as they may be subject to significant and costly errors in planning should they be taken literally.

6. Student progression through educational institutions, and labour market outcomes

Research in South Africa confirms the global findings that an increase in the number of years of schooling increases employment probability, that and there is a significant premium for individuals with higher education.⁹ However, there is little data with which to analyse access to, transitions and pathways through, and outcomes of post-school institutions in South Africa. Periodic systematic studies and data relating to the labour market outcomes of education and training are part of any skills planning mechanism.

The PSET landscape includes adult education and training (AET) centres, TVET colleges, workplace training programmes (learnerships and apprenticeships), and universities.

⁹ Bhorat, H. and Kimani, M.E. (2017) *The Role of Post-School Education and Training Institutions in Predicting Labour Market Outcomes*. LMIP Publication.

The LMIP investigated how to mine existing data sets as well as generate new data sets to answer the question on access, transitions, pathways and outcomes. Tracer studies were conducted in respect of secondary school learners, university graduates, TVET college completers, and workplace training completers. We also: explored existing data sets to determine how they could be mined in order to provide more nuanced information and strategic skills planning intelligence; explored linking the matriculation results (from the DBE) with the HEMIS data sets so as to gain a better understanding of how matric results influence university access, field of study and progression through to university; mined the National Income Dynamic Study (NIDS) to explore school-to-work transitions; and assessed the usability of the Western Cape graduate destination survey for the analysis of labour market outcomes. In addition, we explored using the South African Social Attitudes Survey to measure attitudes to work as well as qualification and occupational matches.

6.1 Piloting tracer methodologies to generate new data sets

Educational pathway or tracer studies are typically longitudinal surveys of a cohort which track individuals' progress through a particular form of training, or from the final years of education into PSET and the labour market. The LMIP piloted a number of tracer studies involving students from universities, TVET colleges, adult education centres, and secondary school sectors.

The contours of a skills planning mechanism *continued*...

Table 4: Proposed new data sets for skills planning

Study and sector	Methodology
Pathways through university and into the labour market: A graduate tracer study from the Eastern Cape ¹⁰ addressed the question: What are the dynamics of access, progression, graduation and labour market destinations underpinning learner, student and worker mobility along various education, training and labour market trajectories?	In 2014, we interviewed graduates, who had completed their 3- or 4-year bachelor's degree at Rhodes University (n = 469) and the University of Fort Hare (n = 742) in 2010 and 2011, about their educational pathways and labour market outcomes.
The pathways of public TVET college learners through NATED programmes ¹¹ analysed students' progression through college and into employment.	Thirty months after their graduation, we conducted telephonic surveys with 3 000 TVET Business Studies and Engineering Studies students who had graduated in 2013 from the N3 and N6 programmes. This data set can form the basis of the NATED destination survey.
Who accesses adult education and where do they progress to? ¹² provided detailed information about the students who participate in the adult education and training (AET) programmes and the value that public adult learning centres (PALCs) and skills centres add to their lives.	This exploratory study used a mixed-methods approach comprising, firstly, a quantitative, pre-coded survey questionnaire in a telephonic interview. Secondly, mediated group interviews were conducted. Data was also collected from the PALCs and the new regional centres managing CET colleges. Data from the DBE, the DHET and Umalusi was used to further triangulate the results. Thirdly, a focused workshop was conducted with fieldworkers and individuals who work in adult education to ascertain their views about the AET system.
Smooth, staggered or stopped: Educational transitions in the South African Youth Panel Study ¹³ described the pathways of young people through the school system over four years. The subsequent report, Exploring Youth Transitions: Five Years of the South African Youth Panel Survey ¹⁴ described the pathways over five years.	The SAYPS, a longitudinal panel study, followed Grade 9 learners, who participated in the Trends in International Mathematics and Science Study (TIMSS) in 2011, over five consecutive years in order to explore the educational transitions of young people. The SAYPS provides an in-depth look at what young people are doing, how they move through the education system, and how their background and school-level characteristics influence these pathways.

Each of the studies generated knowledge about the sector and a methodology which could be institutionalised so that these studies could be conducted periodically. In this section, we describe the methodology for the tracer studies. In section 10, the role of educational institutions in predicting labour market outcomes, we discuss the findings from each of these studies.

- 10 Rogan, M., Reynolds, J., Du Plessis, U., Bally, R. and Whitfield, K. (2015) *Pathways through University and into the Labour Market: Report on a Graduate Tracer Study from the Eastern Cape*. LMIP Publication.
- 11 Papier, J., Powell, L., McBride, T. and Needham, S. (2017) *Survey Analysis of the Pathways of Public TVET College Learners through NATED Programmes*. LMIP Publication.
- 12 Lolwana, P. (2018) *Who Accesses Adult Education and Where Do They Progress To? An Exploratory Tracer Study in Community Education and Training*. LMIP Publication.
- 13 Isdale, K., Reddy, V., Winnaar, L. and Zuze, L. (2016) *Smooth, Staggered or Stopped: Educational Transitions in the South African Youth Panel Study*. LMIP Publication.
- 14 Isdale, K., Reddy, V., Winnaar, L. and Zuze, L. (2018) *Exploring Youth Transitions: Five Years of the South African Youth Panel Survey (SAYPS)*. LMIP Publication.

6.2 Exploring the use of existing data sets to analyse student progression

Conducting new tracer studies is both time-consuming and expensive. The LMIP explored how existing data sets could be mined to generate skills planning intelligence.

Table 5: Existing data sets for analysing student progression

Study and sector	Methodology
Higher education access and outcomes for the 2008 national matric cohort used the linked NSC-HEMIS data sets ¹⁵ from the DBE and DHET and provided valuable information on university access, throughput and dropout in respect of the national matric cohort.	This study combined data to create a nationally representative, integrated, longitudinal administrative data set on matric learners and public-university students. We linked unit-record data on NSC examinations and school characteristics with public-university enrolments and graduations at the national level. The linked 2008 NSC and 2009–2014 HEMIS data set examined university access, entrance, completion and exit patterns over a six-year period (2009–2014) for all learners who wrote the 2008 NSC examinations. This unique data set then analysed: (a) transitions from school to university; (b) how matric results, demographics, and school background influence university outcomes; and (c) how students progress through the public-university system.
Western Cape Graduate Destination Study ¹⁶ assessed the usability of this data set for skills planning. There is a low response rate for tracer studies, and the concern was that the response is non-random and that inferences from those who respond may be inaccurate.	The finding was that the characteristics of responders and non-responders differ in non-random ways. However, the direction of bias on employment outcomes is difficult to identify. Therefore, even with the low response rate, this is a useful data set for skills planning.
Analysis of the National Income Dynamics Study ¹⁷ data provided information about enrolment patterns for public universities, public TVET colleges, and private colleges.	The NIDS collects information on the names and locations of educational institutions (both school and post-secondary) that respondents attend, as well as the geographical locations of households in each wave. We used four waves of the NIDS household survey data for the period 2008 to 2015. We supplemented this data with administrative data from the NSC examinations and a list of South African tertiary campuses in order to answer the research questions.
Tracer studies to assess the outcomes of workplace-based training ¹⁸ reflected on the methodology employed in two previously conducted tracer studies in order to measure the impact of learnerships and apprenticeships and consider the feasibility of institutionalising such tracer studies for WPBL programmes.	This study evaluated: (a) tracer-type research conducted by SETAs into different WPBL programmes; (b) the quality of SETA administrative data sets that capture information on individuals registering for, and completing, training in programmes that the SETAs fund; and (c) the methodology used by the HSRC to assess the impact of learnerships and apprenticeships during the period of National Skills Development Strategy II (2005–2010). There is a huge amount of data within the WPBL system, but very little of this data exists in a central location and it is not captured in a single, standardised system. The data that is currently available needs to be strengthened and expanded.
Proposed public attitudes to work in South Africa data set. ¹⁹ This is a neglected area of investigation. The study provided the perceptions of the employed and the unemployed regarding the labour market. Further analysis in <i>How well-matched are South African workers to their jobs?</i> ²⁰ provided an in-depth analysis of skills, and of qualification and occupation mismatch.	We included a module of questions in the SASAS household survey to investigate the views of the employed about the quality of employment, and the unemployed about the prospects of labour market participation, as well as work-seeking behaviour. We further investigated the extent of overqualification and underqualification among the employed and linked this to demographic and socio-economic determinants.

15 Broekhuizen, H., Van der Berg, S. and Hofmeyr, H. (2017) *Higher Education Access and Outcomes for the 2008 National Matric Cohort*. LMIP Publication.

16 Branson, N. and Leibrandt, M. (2017) *Assessing the Usability of the Western Cape Graduate Destination Survey for the Analysis of Labour Market Outcomes*. LMIP Publication.

17 Branson, N. and Kahn, A. (2017) *The Post-Matriculation Enrolment Decision: Do Public Colleges Provide Students with a Viable Alternative? Evidence from the First Four Waves of NIDS*. LMIP Publication.

18 Wildschut, A., Kruss, G., Meyer, T., Rust, J., Tele, A. and Hlakula, Z. (2017) *Institutionalising Tracer Studies to Assess the Outcomes of Workplace Based Training: Reflections on Feasibility*. LMIP Publication.

19 Mncwango, B. (2016) *Public Attitudes to Work in South Africa*. LMIP Publication.

20 Grapsa, E. (2017) *How Well-Matched Are South African Workers to Their Jobs? A Comprehensive Analysis of Education and Skills Mismatch*. LMIP Publication.

The contours of a skills planning mechanism *continued*...

7. Key skills planning reports

The SPU should produce two key skills planning reports to provide the strategic intelligence for informing its skills policy. The two reports would be: (a) Skills Supply, Demand and Mismatches/Imbalances in South Africa; and (b) Occupations in High Demand in South Africa.

7.1 Skills supply, demand and mismatches/imbalances in South Africa²¹

The purpose of the report was to provide a holistic understanding of skills supply, demand and mismatches in South Africa. The analytical approach has moved away from manpower forecasting to understanding the complexities and intricacies of how supply and demand interact in South African society and the economy, and then developing a skills policy. This report was intended to contribute to the improvement of the responsiveness of the PSET system to the needs of the economy and society. The key findings from this study are as follows:

1. Skills planning in South Africa is located in a structural conundrum. Our jobs and skills history profile is different from that of East Asian or European countries, in that our economy must respond to the

twin challenges of, on the one hand, participating in a globally competitive environment which requires a high skills base, and, on the other, a local context that creates low-wage jobs (with supported training) in order to absorb the large numbers who are unemployed or are in vulnerable jobs. The economy must include more labour-intensive forms of growth so as to absorb the growing number of especially young people as first-time labour market entrants. This will require significant changes to both industrial policy and the development pathways being pursued by the country.

2. Stronger integration and coordination of the different government departments' growth initiatives and strategies targeting skills development and education are needed. Currently, there are many national- and provincial-level strategies that aim to promote local economic development and respond to unemployment. These growth plans must take into account skills requirements or they will likely experience difficulties in implementation. Therefore, government departments must realistically estimate the skills needed for the implementation of the growth strategies and plan their human resource strategy in advance.
3. The key constraint to higher levels of education is the quality of basic

education, especially in the numeracy/mathematics and literacy/language areas. We must increase the progression and success rates for basic education, universities and TVET colleges. For those who can enter university and TVET colleges, their completion rates are low, especially as regards science, engineering and technology (SET) and commerce degrees and diplomas.

4. At the professional level, there is a demand for science, technology, engineering and mathematics (STEM) graduates. STEM graduates are needed for management occupations, the engineering professions, the medical professions, as well as for the teaching professions (particularly secondary school mathematics and science teachers as well as early childhood development professionals).
5. As regards managers, there is a need to increase the supply of graduates in certain technical subjects. These graduates should then be supported by way of improved, professional workplace experience and mentorships in order to gain management skills.
6. At the technician level, there is an undersupply of engineering technicians and associate professionals, as well as of those with skills in the building and construction, metal machinery,

²¹ Reddy, V., Borhat, H., Powell, M., Visser, M., and Arends, F. (2016) *Skills Supply and Demand in South Africa*. LMIP Publication.

electronic and electrical spheres, and related trades.

7. With high levels of youth unemployment, and the majority of youths having either incomplete or completed secondary education, there is a strong argument to prioritise appropriate skills training for this group. Further, given the expanding number of low-skilled or semi-skilled entrants to the labour market and the expected expansion in higher-level jobs, the current situation of expanding unemployment among low-skilled people will continue. The SETAs are mandated to play a key role in this process, especially regarding those who have minimal skills and who face difficulties gaining employment.
8. Nearly half of the higher education graduates are employed in the community, social and personal services sector and a high proportion of SET graduates, from both the higher and technical education sectors, prefer to work in the financial services sector. STEM graduates have a set of versatile skills and therefore can, and do, work in different sectors. The implication for education and training is that there is a need to enrol and graduate higher numbers of STEM graduates than what is required by current levels of STEM occupations.

9. The targets and funding of the National Plan for Higher Education should be reviewed in order to increase the share of SET enrolments in university courses from the present 30% to 35%, especially in the engineering and health professions.
10. The TVET sector must develop enrolment targets in line with skills needed for the labour market, and we recommend a target of 45% for NC(V) 4 and NATED 6 (N6) engineering courses.

7.2 Occupations in high demand in South Africa²²

The LMIP adopted a novel methodology, after a review of a number of international approaches, of identifying and measuring skills and occupational needs. The 2018 occupations in high demand (OIHD) methodology employed a hybrid approach where both top-down (statistical) and bottom-up (qualitative) evidence were considered and integrated in order to identify occupations in high demand. The following four dimensions of occupational demand were used: wage pressure; vacancy pressure; employment pressure; and priority demands from sectors and government growth initiatives.

²² Reddy, V., Rogan, M., Mncwango, B. and Chabane, S. (2017) *Occupations in High Demand Technical Report and List*. LMIP Publication.

The South African 2018 OIHD lists the following occupations as being in the highest demand:

- Managers: Finance, business, sales and marketing, manufacturing, ICT, professional services and construction;
- Engineering: Civil engineers, mining engineers, industrial engineers, as well as several types of engineering professionals and technicians;
- School teachers;
- Medical laboratory technicians and health-care assistants;
- Farming, forestry and fisheries scientists and advisors;
- Financial and investment advisors;
- Software and applications developers;
- Lawyers and legal professionals; and
- Chefs.

7.3 Skills needs in South Africa

The key skills signals from our studies are that STEM-qualified professionals, associate professionals and technicians are needed for the engineering, health and medical, and teaching fields. There is a continued need for managers with technical qualifications. These graduates should then be supported by improved professional workplace experience and mentorships so as to gain management skills.

Strategic intelligence to plan for skills

In addition to the largely numerical and statistical information for skills planning, we need further nuanced analyses at: the macro-level (the shape of the economy and how it influences skills development; and the role of institutions in predicting labour market outcomes); the meso-level (interactions between institutions and firms); and the micro-level (the sociology of workplaces). The following sections provide a summary of the key findings (full reports available on Imp.org.za).

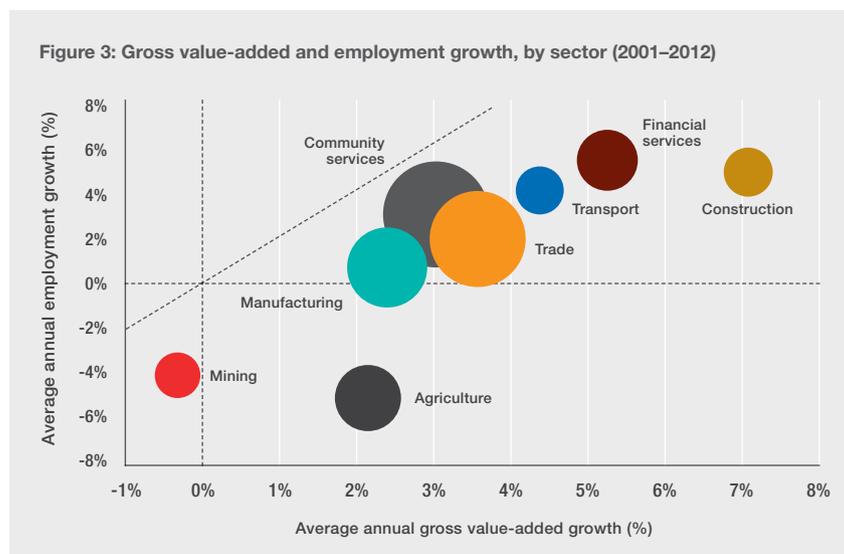
8. The sectoral nature of the South African economic growth trajectory

The nature of sectoral and occupational labour demand trends has defined much of the debate around skills shortages, high levels of unemployment, and the need for a more equitable growth path. We conducted research in order to understand the critical link between sectoral growth, employment and poverty reduction in South Africa. International research shows that job creation requires both high levels of growth and increased labour intensity in production. The more labour-intensive an economy, the larger the reduction in household poverty.

8.1 Sectoral contribution by gross domestic product and employment growth

Since 1994, the South African economy has been characterised by positive but low levels of economic growth, high levels of unemployment, and rising household income inequality. Economic growth in post-apartheid South Africa has been driven largely by capital-intensive industries, the retail trade, and financial services rather than by productive and labour-intensive sectors such as agriculture and manufacturing.

The growth and employment trajectory can be seen in the interaction between the sectoral contribution to gross domestic product (GDP) and employment growth, as shown in Figure 3. Each bubble represents a sector, and the size of the bubble indicates the relative size of employment in that sector in 2001. The coordinates of the centre of each bubble therefore indicate the sector's output and employment growth over the period. Bubbles above the 45-degree line show sectors whose employment growth exceeded output growth, and vice versa for bubbles below the line. Sectors with positive output growth



Source: Borat et al. (2014).

are expected to have positive employment growth, while declining sectors are expected to shed jobs.²³ Specifically, no sectors are above the 45-degree line, indicating that employment growth was less than output growth for all sectors of the economy for the period 2001 to 2012. Mining and agriculture fared particularly poorly during the period: output growth was negative for mining and a low positive for agriculture – and employment declined considerably in the mining and agricultural sectors. Employment growth in the manufacturing sector was near zero over the period, despite a positive output growth rate of 2.4%. Conversely, the construction and financial services sectors showed relatively high output and employment growth during the period.

The growth in the secondary and tertiary sectors has not been sufficient to absorb new entrants into the labour market, including those who have lost jobs in the agricultural and mining sectors since 2001. Employment growth since the end of apartheid has not been sufficient to absorb the rapidly growing supply of workers: the economy generated 5.6 million jobs between 1995 and 2014, while the labour

force grew by almost twice this quantum, resulting in 9.8 million new entrants into the labour market. A consequence of labour force growth in excess of employment growth over the period was a large expansion in the number of unemployed individuals, as well as an increasing number of discouraged jobseekers.

8.2 Drivers of labour intensive economic growth and poverty reduction

Understanding the drivers of labour-intensive economic growth and poverty reduction *at a sectoral level* is crucial. We conducted a number of studies to understand these issues, and the key observations are as follows:

1. There was a collapse in primary-sector employment and lacklustre employment growth in the manufacturing sector. It is crucial to note that not a single, fast-growing, developing economy has managed to be successful without a dynamic, export-oriented, light-manufacturing sector. Such a sector is absent in the South African economy. What we have instead is a heavy-manufacturing sector that is capital-intensive and neither job-generating nor skills-enhancing.²⁴

2. Our growth and employment trajectory since 1994 has been built on a rapid rise in the share of GDP of financial and business services and, to some extent, consumption- and service-oriented sectors. The public sector is a growing source of employment, whilst a dominant source of private-sector employment has been through temporary employment services (also known as labour brokers).
3. The upshot of this unbalanced growth and employment trajectory has been a continuation and reinforcement of South Africa's skills-biased labour demand trajectory. Since 2001, there has been uneven employment gains in high- and medium-skilled occupations, at the expense of less-skilled workers.
4. The nature of South Africa's post-apartheid economic growth performance shows that South Africa's labour demand trajectory has systematically excluded those with lower levels of education, thereby facilitating high rates of unemployment among school leavers. Employment grew for degree-holders in terms of high-skilled occupations, whereas the certificate cohort saw employment growth in the high- and medium-skilled occupations. In terms of wages, it is only workers with a higher education degree who have generated significant and positive returns to

23 Bhorat, H., Cassim, A. and Hirsch, A. (2014) *Policy Co-ordination and Growth Traps in Middle-Income Country Settings: The Case of South Africa*. Working Paper Series. World Institute for Development Economic Research (UNU-WIDER).

24 Bhorat, H., Goga, S. and Stanwix, B. (2013) *Occupational Shifts and Shortages: Skills Challenges Facing the South African Economy*. LMIP Publication.

economic growth. Of particular concern here is that the technical and vocational education and training (TVET) system is an insignificant contributor to economic growth, as are all other forms of schooling.²⁵

5. The temporary employment services (TES) sector increased in terms of employment from 0.2 million in 1995 to 0.97 million in 2014, accounting for 6.4% of total employment. The TES sector contributed 7.6% of the country's GDP in 2014 and an approximate 0.02% reduction in the poverty headcount ratio in 2012. The empirical profile of the TES sector is that it is fast-growing, semi-skilled and youth-intensive.²⁶
6. The small, medium and micro-enterprises (SMMEs) in the informal sector are of developmental importance and a policy priority.²⁷ The determinants of SMME performance are the following:
 - (a) The ability to acquire additional skills is influenced by an individual's formal education base, and this base is weak

25 Bhorat, H., Cassim, A. and Tseng, D. (2014) *Higher Education, Employment and Economic Growth: Exploring the Interactions*. LMIP Publication.

26 Bhorat, H., Cassim, A. and Yu, D. (2016) *Temporary Employment Services in South Africa: Assessing the Industry's Economic Contribution*. LMIP Publication.

27 Steenkamp, F. and Bhorat, H. (2016) *The Role of Skills and Education in Predicting Micro-Enterprise Performance*. LMIP Publication.

in the case of informal-sector enterprise owners (consequently, raising levels of education and literacy are important); (b) Multiskilling is a key element of running a business, especially in the informal sector, and thus the inclusion of a variety of business skills (e.g. accounting, information technology and marketing) in a skills development initiative is important; and (c) On-the-job training and practical, work-related experience are important. Therefore, 'training with production' may be an important element of an overall skills development initiative.

9. Harmonisation (or not) between economic and skills policy: The case of the New Growth Path

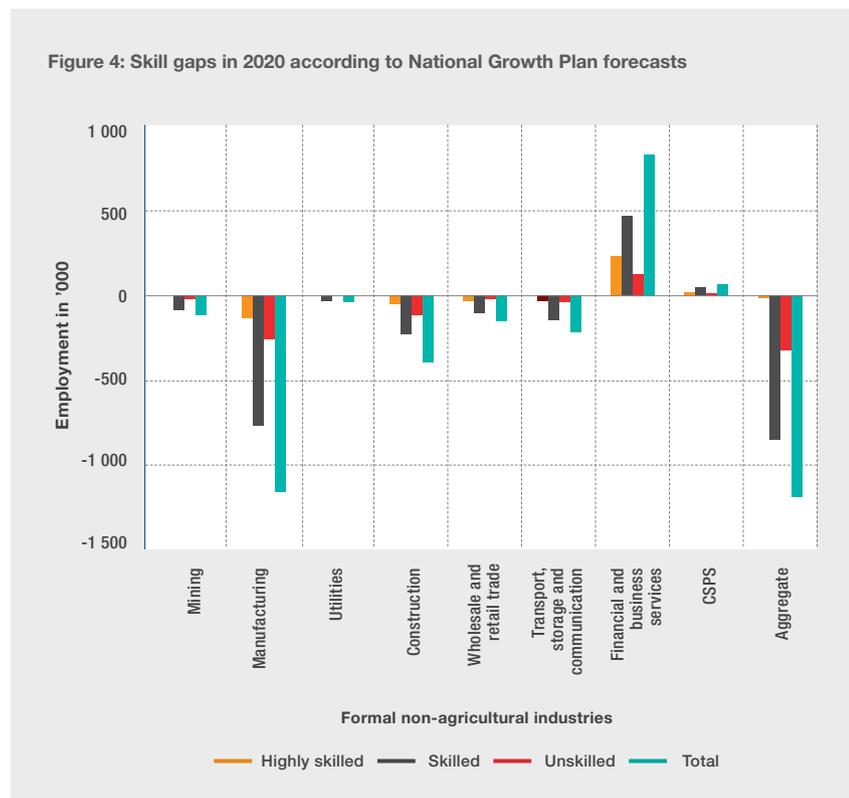
The New Growth Path (NGP) strategy for economic growth proposes a structural shift in employment from the tertiary to secondary sectors, with an emphasis on manufacturing as the key employment generator. The Labour Market Intelligence Partnership (LMIP) analysed the current structure of South Africa's labour market and its output growth implications and compared this with job-creation targets set in the NGP. The study further analysed the skills implications of the jobs.²⁸

28 Bhorat, H. and Tian, N. (2014) *Growth, Employment and Skills: The New Growth Path Revisited*. LMIP Publication.

The comparison showed that, for the eight industries under examination, only the financial and business services and the community, social and personal services (CSPS) industries will reach or exceed the proposed NGP targets. Two of the three largest employment contributors (manufacturing and construction) will create an employment shortfall in excess of 1.25 million jobs.

The study disaggregated skills shortages by sectors and by skills levels and found a skills gap in respect of skilled and highly skilled workers. It argued that, under the current economic growth trends, the current shortages will be deepened in all industries except for financial and business services, and community, social and personal services. The skills implications of the 2.8 million NGP jobs to be created is that 1.84 million will be skilled jobs, 570 000 unskilled jobs and almost 400 000 highly skilled jobs. By 2020, our forecasts expect a shortfall of 1.2 million jobs, which can be divided into skills shortages of 860 000 skilled workers, 330 000 unskilled workers and 13 000 highly skilled workers. These shortages will be almost entirely accounted for by the manufacturing industry should the sector's employment and growth targets be met.

These findings have implications for education and training provision, particularly in the TVET sector where the skills for the intended sectors of employment growth should be prioritised.



Source: Statistics South Africa, Quarterly Labour Force Survey 2012Q4; EDD (2011) Statistics South Africa: various QES 2012Q4; own calculations

10. The role of educational institutions in predicting labour market outcomes

There is an established body of research that emphasises the strong relationship between good-quality school and post-school education and improved economic, social and personal returns. We conducted a number of studies to examine issues of access, progress, and labour market outcomes in respect of students participating in educational programmes at different educational institutions.²⁹ In Section 6 on student progression through educational institutions, and labour market outcomes, we describe the aims and methodologies of the studies we conducted. In this section, we describe the key findings with respect to the pathways through the educational institution (formal schooling, adult education centres, TVET colleges, and the university sector) and their labour market destinations. The purpose is to examine human capital accumulation at these different institutional levels and the labour market outcomes.

²⁹ Rogan, M. (Ed) (2018) *Post-School Education and the Labour Market in South Africa*. HSRC Press.

10.1 Secondary schools

Traditionally, the outcomes with regard to schools are not explicitly considered for skills planning. However, in South Africa, given the low (though slowly improving) levels of basic education, the school sector is graduating low numbers of high school completers who are adequately prepared for enrolment in post-school education and training (PSET) institutions.

The findings from our five-year longitudinal study³⁰ are that the pathways through the senior secondary phase are complex and deviate from expected routes: some youths progress through the school system and into post-school education with ease, while others are getting stuck within the education pipeline. Individual achievement remains the key driver of successful academic transitions and, while it is possible for learners to overcome the odds against them, getting the foundations of literacy and numeracy right in the earliest grades for all learners is the key to improving progression across the system. More than four in ten learners experience considerable grade repetition, leading to interrupted pathways throughout their school careers. Of concern is that staggered (rather than smooth) pathways are becoming the 'new

30 Isdale, K., Reddy, V., Winnaar, L. and Zuze, L. (2018) *Exploring Youth Transitions: Five Years of the South African Youth Panel Survey (SAYPS)*. LMIP Publication.

norm' for learners in South Africa, with each interruption decreasing the likelihood of reaching and passing Grade 12. Social advantage, operating particularly through school-level characteristics, also remains a key predictor of learner transitions.

10.2 Adult education and training in community education and training colleges

The LMIP conducted an exploratory study³¹ to describe the profile of those who attend adult education and training (AET) programmes, and to trace their pathways once they leave the programmes. We found that students in the AET sector are younger than before, with more females (61.1%) and the majority of learners being black Africans (94.8%). Just over three-quarters lived with family members (parents, siblings, grandparents), and over 90% lived in a township and attended a skills centre in the township. There were more students (56%) studying for the National Senior Certificate (NSC) in this sample than for any other qualification.

Three-quarters of participants had left school within the last five years, and most had left in Grade 12, largely because they were having difficulty understanding their

31 Lolwana, P. (2018) *Who Accesses Adult Education and Where Do They Progress To? An Exploratory Tracer Study in Community Education and Training*. LMIP Publication.

school subjects, especially mathematics. These students aspire to continue with their studies. Of those who wrote the examinations, 67% passed their subjects for the Further Education and Training Certificate; 82% passed subjects for the NSC; and 89% achieved success in skills programmes. Students who left school in the Grade 12 year, and were around 18 or 19 years of age, performed much better than those who were younger or older. This 'second-chance' programme for those wanting to complete a Grade 12 certificate has experienced success.

The AET students come from conditions of extreme socio-economic vulnerability. They fit the profile of adult education learners globally (i.e. in community colleges), namely: late starters; adult learners being offered a second chance; working students; and students who are place-bound (e.g. parents with childcare responsibilities). This student profile has implications for the kind of institution that has to be established for these learners in order for them to succeed.

10.3 Technical and vocational education and training colleges

Little is known about students' progression from TVET colleges into employment. The LMIP conducted two studies to enhance our knowledge and insights about pathways and progressions through these institutions.

Strategic intelligence to plan for skills *continued...*

Using the National Income Dynamics Study (NIDS) data,³² the LMIP found that, on average, many baseline socio-economic characteristics of TVET enrollees do not look substantially different from those who do not attend any form of post-secondary education within two years of finishing school. However, household income during the matric year is highly significant in explaining enrolment in all types of post-secondary institutions, including TVETs. Further, individual ability (as measured by numeracy test scores) is important in explaining enrolment in both universities and TVETs, even after controlling for socio-economic background and school-quality variables. These findings suggest that increasing the number of places available at TVET colleges without expanding funding opportunities and improving learners' school achievement scores is unlikely to result in the target of 2.5 million learners in TVETs by 2030 being met.

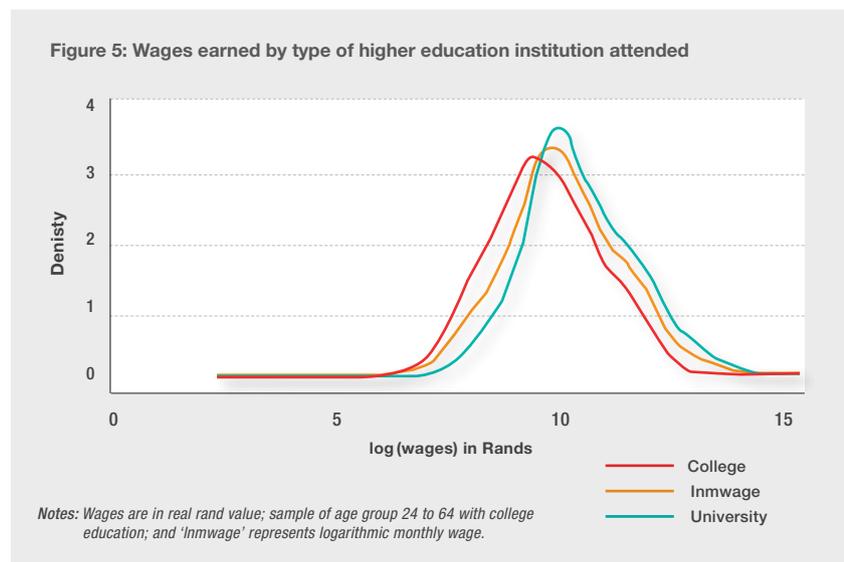
A second study³³ conducted a telephonic survey of some 3 000 TVET Business Studies and Engineering Studies graduates from the N3 and N6 programmes.

Two-and-a-half years after graduation, just over half (52.3%) of these 2013 graduates were employed. Of those employed, 34.4% were in internships or apprenticeships, 50.2% were in permanent employment or long-term contracts, and 15.4% were in short-term contracts. For graduates not in

employment, 47.7% indicated that they were unemployed, 3% were self-employed and 10% were studying.

10.4 Universities

We conducted a number of studies using new and existing surveys to investigate the pathways and outcomes in respect of university education.



32 Branson, N. and Kahn, A. (2017) *The Post-Matriculation Enrolment Decision: Do Public Colleges Provide Students with a Viable Alternative? Evidence from the First Four Waves of NIDS*. LMIP Publication.

33 Papier, J., Powell, L., McBride, T. and Needham, S. (2017) *Survey Analysis of the Pathways of Public TVET College Learners through NATED Programmes*. LMIP Publication.

Using the first three waves of the NIDS,³⁴ Bhorat et al. found that an increase in years of schooling increases employment probability, and that there is a significant premium for individuals with higher education. Attending a university relative to a college increases an individual's chance of employment by 7 to 10%, and the earnings premium for attending a university is twofold. While returns to education and employment are high for males and females, there were nuances. Women are disadvantaged in both employment and earnings; and earnings vary by occupation and by both geographical area and provinces.

The tracer studies of students graduating from two Eastern Cape universities³⁵ and moving into the labour market found that schooling background, race and gender are significantly associated with (1) successful career choices, and (2) the risk of unemployment. In particular, the survey revealed that black graduates,

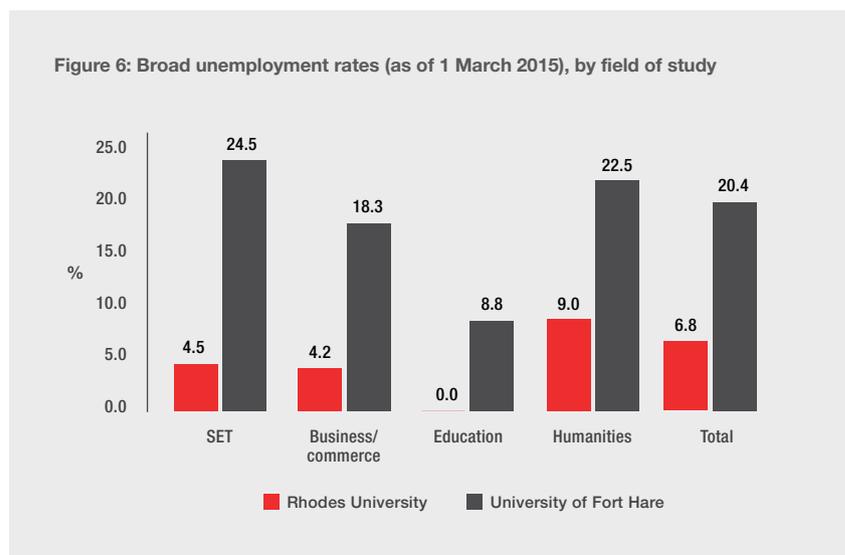
specifically those from low-quintile schools, were significantly less likely to graduate with their first-choice degree (especially those wanting to study a commerce or science, engineering and technology (SET) subject).

The study further found that levels of unemployment among graduates from both Rhodes University and the University of Fort Hare were very low when compared with the working-age population as a whole. However, women from low-quintile schools were most likely to experience unemployment. Critically, there was a significant variation in unemployment levels

between Rhodes graduates and Fort Hare graduates. As shown in Figure 6, the unemployment rate for Fort Hare graduates (20%) was almost three times higher than that of Rhodes graduates (7%). For those employed, the results indicated that successful job-search strategies differed significantly, and graduates from Rhodes were far more likely to report finding a job through a social network than graduates from Fort Hare. We also found that Rhodes graduates were more likely to be employed in the private sector, while Fort Hare graduates were significantly more likely to be employed in the public sector.

34 Bhorat, H., Cassim, A. and Tseng, D. (2014) *Higher Education, Employment and Economic Growth: Exploring the Interactions*. LMIP Publication.

35 Rogan, M., Reynolds, J., Du Plessis, U., Bally, R. and Whitfield, K. (2015) *Pathways through University and into the Labour Market: Report on a Graduate Tracer Study from the Eastern Cape*. LMIP Publication.



Strategic intelligence to plan for skills *continued...*

The Cape Higher Education Consortium administered a tracer survey to their 2010 cohort of graduates at each of the four universities. Analysis of this data³⁶ corroborated the findings from the Eastern Cape survey, in that African graduates are less likely to be employed than other graduates. This is potentially due to a persistence of racially based employment decisions, since African individuals from the same institutional background still find it harder to find employment than similar counterparts from another race group. Besides race, those who study health and education are at a relative advantage, and those who study humanities and social science are at a relative disadvantage when it comes to finding employment. Those who complete an undergraduate or postgraduate degree rather than a certificate or diploma are at a relative advantage, with postgraduate degree-holders being further advantaged. The institution of study also affects the likelihood of finding employment.

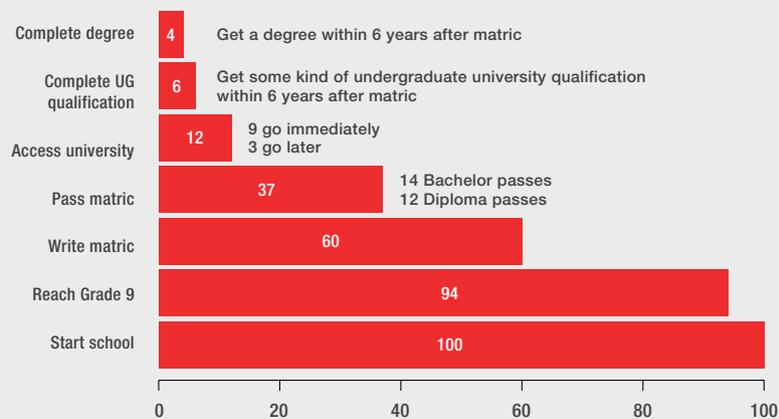
Broekhuizen et al.³⁷ created a unique data set that linked learners who were both in the 2008 NSC examinations and the Higher

Education Management Information System (HEMIS) data sets. The data set allows novel analyses of the transition from school (matric) to university, that is, of university access, and of how matric results influence university outcomes (completion and dropout). The findings show that one-third of students who obtained bachelor passes never go to university. In addition, those who do gain access to university often take a long time to complete their studies, with many never completing at all. As a result, only a select minority of matric learners manage to obtain university qualifications. Significant inequalities in university outcomes between race groups and across

geographical space also remain evident. However, the results from the analysis suggest that observed patterns of university access and university success are strongly influenced by school results. The school system has a major influence on who reaches matric, and how they perform in matric. This, and particularly the achievement of bachelor passes, explains much of the difference in university outcomes by race, gender and province.

In order to understand human capital accumulation, the study also estimated the progression rates through the schooling and post-schooling systems and found

Figure 7: Progression from schools to tertiary qualifications: A helicopter view



³⁶ Bhorat, H., Lilenstein, A., Lilenstein, K. and Oosthuizen, M. (2017) *Youth Transitions from Higher Education to the Labour Market*. LMIP Publication.

³⁷ Broekhuizen, H., Van der Berg, S. and Hofmeyr, H. (2017) *Higher Education Access and Outcomes for the 2008 National Matric Cohort*. LMIP Publication.

that, for every 100 learners who start Grade 1, 60 will write matric and only 37 will pass. Four of the 100 learners starting Grade 1 will complete a degree six years after completing matric. These findings reinforce the concerns about the quality of instruction and the experiences in both schooling and post-school institutions, and the critical need for these progression rates to improve.

10.5 The National Student Financial Aid Scheme and higher education

The National Student Financial Aid Scheme (NSFAS)³⁸ was established in 1999 and funding grew from R441 million to R8.5 billion in 2013, making the programme one of the significant interventions affecting access to tertiary education for the poor and disadvantaged. Over the period 2000 to 2012, the number of recipients grew by 260% to cover 20% of all university students.

The overwhelming majority of NSFAS recipients have consistently come from historically disadvantaged backgrounds. NSFAS has been particularly successful at targeting women (60% in 2012) and African, Coloured and Indian students. The subject pass rate (defined as the percentage of subjects passed of those taken in any given

38 Broekhuizen, H., Van der Berg, S. and Hofmeyr, H. (2017) *Higher Education Access and Outcomes for the 2008 National Matric Cohort*. LMIP Publication.

year) of NSFAS recipients was, on average, extremely high, with NSFAS recipients passing the majority of their courses. Interestingly, the mean subject pass rate was higher at historically black institutions (HBIs), where NSFAS students passed 83% of their subjects, compared with 79% at historically white institutions (HWIs).

While historically disadvantaged students have benefited, there are some differences in the size of awards received across races. Encouraging trends are a positive association between NSFAS award sizes and student performance, as measured by both the 'subject pass rate' and the likelihood of passing all subjects. The positive association between NSFAS award size and student performance is slightly stronger at HBIs than at HWIs.

11. Understanding skills planning at the meso- and micro-levels

There is a gap in understanding skills planning at the meso- and micro-levels. There are limited insights from the actors involved in firms and production processes, from those in higher and vocational education and skills training systems, and by those responsible for implementing policy in specific sectors or regions. In response to this gap, two research themes within the LMIP adopted conceptual and analytical frameworks that had not yet been used extensively before in order to

examine issues of skills supply and demand in South Africa.

The first study relates to the alignment between the PSET sector and the labour market. We studied (a) labour market interactive capabilities, structures and mechanisms in PSET institutional settings,³⁹ and (b) curriculum responsiveness and student employability in vocational education and training institutions.⁴⁰ The second study relates to the changing occupational milieus and identities, with a focus on artisanal work and training. We studied (a) the history of artisanal skilling and employment,⁴¹ (b) the shifting boundaries between artisanal work and other occupational groups,⁴² and (c) work and qualification futures for artisans and technicians.⁴³

39 Kruss, G., Wildschut, A. and Petersen, I. (Eds) (2018) *New Research Perspectives on Skills Planning: Sectoral, Occupational and Regional Lenses*. HSRC Press.

40 Wedekind, V. and Mutereko, S. (2016) *Employability and Curriculum Responsiveness in Post-School Education and Training*. LMIP Publication.

41 Mbatha, C.N., Wildschut, A., Mncwango, B., Ngazimbi, X. and Twalo, T. (2014) *Towards Understanding the Distinctive Nature of Artisan Training: Implications for Skills Planning in South Africa*. LMIP Publication.

42 Wildschut, A. and Meyer, T. (2016) *A Study of the Shifting Boundaries of Artisanal Work and Occupations*. LMIP Publication.

43 Gamble, J. (2016) *Work and Qualifications Futures for Artisans and Technicians*. LMIP Publication.

Strategic intelligence to plan for skills *continued...*

11.1 Interaction and alignment between education and training systems and labour markets

The first study explored the actors and interactive capabilities in skills development networks. We conducted case studies of sectoral innovation systems and investigated interaction and alignment around skills planning within firms, PSET institutions, and intermediary organisations. This was done for three sectors: sugar-growing and milling in KwaZulu-Natal, automotive component manufacturing in the Eastern Cape, and the Square Kilometre Array (SKA) telescope nationally, in order to identify what is possible on a wider scale.

The automotive case study highlighted the implications of the lack of dynamic, interactive capabilities on the part of universities in the region for automotive firms to address changing skills needs, while the SKA case showed how the ability to connect skills, knowledge, technologies, networks, intermediaries and funding has been paramount in ensuring the success of universities in responding to the skills needs in this sector. With regard to the sugar-growing and milling case, changing skills needs were experienced at the basic, intermediate and high skills levels, thus needing alignment with all levels of the post-school system. This case highlighted the critical role of public- and private-sector intermediaries in ensuring skills alignment.

We draw high-level implications, for the post-school sector, based on the central conclusion that *skills planning requires a sound understanding of the will, competencies, and interactive capabilities of universities and colleges to respond to enterprise demand.*

1. For universities and colleges, linkages with firms in key sectors or with government agencies may have the benefits of: funding for bursaries; chairs in new fields of study; significant ideas for new research or programmes; more opportunities for workplace learning and internships; and more employment opportunities for graduates. Understanding the changing nature of work and technology on the demand side in specific sectors may inform new qualification and programme offerings that are ahead of the curve. However, academics and lecturers may actively oppose any initiative that they perceive as imposing a narrow, instrumental approach to training. To lay the basis for a shift to a demand-led model of skills planning, an advocacy process to effect a change in thinking may be required. Universities and colleges, and their leaders, managers, academics and lecturers, need to be convinced of the value of interaction and networking with firms, government agencies and other organisations.
2. Firms and employers are only willing to work with universities and colleges that produce quality graduates able to perform in the workplace. Developing these academic 'competences' in core programmes, curricula and pedagogy is a necessary (but not sufficient) condition for responding to demand.
3. Colleges and universities need expertise, structures and interface mechanisms that can support linkages with firms, government agencies, and intermediary organisations. The leadership of a university and college plays an important role in terms of the policy and direction they provide, as do academics and lecturers who can provide innovative and well-grounded courses. Strengthening universities' and colleges' interactive capabilities should be a fundamental focus for leadership within post-school organisations, and for the DHET across the post-school system.
4. There are many external interface mechanism that are very effective. The system of cooperative learning can be extended to other contexts so as to promote different forms of work-integrated learning. Others are advisory bodies, research, testing centres, and careers advisory and placement centres. Public-private partnerships and networks are also a way to create and

nurture interaction. Other potential benefits are: new teaching and research programmes; staff exchanges facilitating academic capability building; recruitment of more students; and growth of knowledge or technology niches. Such structures and interface mechanisms should be extended and grown in more colleges and universities, drawing on good practice as a guide, so that responsiveness can be deepened.

5. Technology and work are changing rapidly, which means that the qualifications and skills required are changing. The ability to continually sense changes in the environment, adapt to the demand for new skills, and coordinate change across the university or college is critical. Developing dynamic, interactive capabilities of individual lecturers, academics, departments, centres and leadership will mean that universities or colleges can respond more appropriately to changing skills demand.

The second study examined the alignment or disconnect between labour market demand and skills development, and used a skills ecosystem approach in two sectors, agro-processing (sugar and forestry) and automotive production and maintenance, in order to understand the issues of responsiveness and employability. The

research findings regarding five broad drivers that shape the kinds of curriculum responses that can enable or hinder employability are the following:

1. In terms of *employers*, the key finding was that there is no single view on what makes people employable, and what employers' training responsibilities should be. Employers placed great value on reputation and trust, signalling a need to raise awareness and build understanding about new qualifications. There was also the question about how closely programmes should be aligned to a specific industry, as this may in fact limit employability and ultimately make a programme unattractive.
2. The extent to which *student* needs were taken into account varied across the cases. Structured programmes of support or simply caring lecturers made a difference. For most students, the greatest obstacles were material issues such as accommodation, transport and food. Addressing the obstacles requires a multipronged approach.
3. *Policy* (or the lack thereof) framed the curriculum, and, in some instances, constrained what could be achieved. For example, the requirements of the National Qualifications Framework (NQF) made it difficult to combine different

levels of knowledge and purpose in one work-oriented programme. Policy and regulations also facilitated coordination within a sector or industry, which made it easier to respond to skills needs at this meso-level.

4. There are also *social and environmental* pressures and concerns that demand a response, based on an ethical and social justice imperative. These responses may at times act in tension with employer perspectives, but do offer a vehicle through which wider generic skills can be taught.
5. Curriculum is always mediated by the capacities and resources available in the *organisation*, and has to align with organisational procedures. Curriculum decisions are shaped by staffing needs, organisational systems and priorities, and strategic decisions such as cross-programme outcomes.

Overall, the research findings suggest that *curriculum* responsiveness is a complex interplay of multiple factors and not a simple correspondence between employer needs and curriculum. The formal learning in a qualification is one component of, but not the entire, pathway. Critically, there needs to be recognition of what learning is assumed to be in place before, and what learning will happen once, the student enters the

Strategic intelligence to plan for skills *continued*...

workplace (and measures to redress gaps). This is partially addressed through work placement, but also through mentorship and induction, which employers should structure much more systematically as part of the curriculum.

12. Work change and its implications for skills needs: A focus on artisanal work

This research argues that we have been unable to successfully address issues hampering the increased output of quality artisans in South Africa because of a limited understanding of the context within which artisanal skills development and practice takes place, that is: the history of artisanal development; changing occupational structures; and changing knowledge and skills bases. Researchers conducted three complementary studies, at different levels of analysis.

The first study provided a history of the evolution of the artisanal training system in South Africa, in the context of the production environment in which training was provided, and shaped by economic and political changes and the related shift in labour market and training policies. The review illustrated how, in the pre-democratic period, the development of the artisan training system was characterised by racial, geographic and sectoral exclusion. This

history reflects the challenges of technical and vocational skills production, within a broader legislative environment that aimed to exclude black citizens. These manifest as ongoing challenges for the current suite of training policies in a democratic system. The research illuminates the importance of an understanding of artisanal history within the prevailing economic and social conditions, and this is critical information to feed into skills planning policy and practice.

The second study drew theoretically and conceptually from the *sociology of work and professions* in order to highlight how employing an occupational lens can illuminate the real impact of work changes on the scope of practice of a particular occupation. The approach illustrates how *organisational and occupational cultures* play distinctive roles in shaping skills requirements in respect of particular occupational groups. For example, the research found that, in some cases, due to the limited capacity of firms to uptake technologies, the demand for particular artisanal skills remained largely unchanged. On the other hand, in another sector, the demand for artisanal skills was affected by new forms of the organisation of work to such an extent that even within a single trade the demand could vary by department within firms. This has implications for how we develop plans to address shortages of skilled artisans and illustrates why it is

important to understand these contexts at the meso- and micro-levels of the firm.

The third study employed an approach based on the *sociology of knowledge and the labour process*. This demand-side analysis of work and qualifications futures for artisans and technicians focused on work itself and the labour process. The empirical cases were: boat-building (boat builder and repairer); engineering (mechatronics technician); film production (camera assistant); and tourism and hospitality (confectionary baker). The mechatronics case indicated a clear upward shift in the conceptual knowledge base required of artisan-type work, while, in the remaining three cases, there were trends towards both upskilling and downskilling. The common thread throughout the sectors is that each one, in its own way, still values a craft model based on all-round expertise and control of work from start to finish as the best way in which to prepare artisans. In other words, there is clear evidence showing a preference for the apprenticeship model.

Another key finding with implications for artisanal training is that on-the-job and informal learning remain the dominant modes of education and training, with supplier-provided training relating to specific items of equipment or technology a fast-growing trend within firms. This

research thus highlights how focusing on actual work and the education and training processes and their differences in large and small enterprises can provide a solid basis for supply-side planning.

These studies have shown work-related knowledge and skill to be complex and multifaceted, involving different and sometimes contradictory dimensions. At the very least, interventions aimed at addressing the skills development needs of a particular occupation thus have to draw on a clear investigation of the drivers of demand in that industry sector and the particularity of firms constituting that sector. The key contribution is to interrogate how work itself is changing, and the impact of such changes on the skills required to practise an occupation. As occupational contexts increasingly shift, and are predicted to shift even faster, these become pertinent issues for skills planning and policy. The key lessons are as follows:

- In order to improve our interpretation of nationally identified demand signals, smaller case studies of artisanal work within firms should be conducted.
- Rather than continuing with a dual mode of delivery, evidence of the value of all-round expertise suggests a return to apprenticeship as the main mode of delivery towards artisanal qualifications at the intermediate level.
- Different levels and types of apprenticeship will be required to serve the simultaneous upskilling and downskilling of artisanal work. Single artisanal trade qualifications will not be sufficient. The artisan training system needs to be a diversified system with multiple entry and exit points and different types of training delivery.
- As on-the job training essentially provides the narrower skills base required in routinised and highly standardised work environments, formally registered and recognised short courses will need a definite space and acknowledgement as part of the suite of artisanal training options.

Lessons for establishing the skills planning mechanism

The following summary provides high-level direction for the Department of Higher Education and Training (DHET) to establish the skills planning mechanism for South Africa, as well as signals from the labour market on key considerations to inform skills planning.

The contours of a skills planning mechanism
Skills planning
1. The skills planning exercise must be viewed as a compass providing a sense of direction of where things will be as opposed to a GPS which tells one what to do at every crossing.
2. Skills planning addresses two separate but interrelated processes. The first pertains to the labour market information systems and processes associated with data collection, analysis, and the production of labour market intelligence. The second relates to how stakeholders work together and foster the alignment between industrial strategies, government growth initiatives, and societal needs in order to estimate the skills demands and devise skills policy.
Approach to skills planning for South Africa
3. We propose an inclusive socio-economic skills planning approach. Skills policy must respond to the needs of the formal and informal economy and of the vulnerable and unemployed in society. We must improve the quality and success rates in the basic and post-school education and training (PSET) systems, identify the skills needed to support and grow a productive economy, and ensure that the PSET system responds to the development of these skills. The education and skills strategy must include a programme for skilling the unemployed, and workplace training must lead to improved job opportunities for all workers as well as the upgrading of skills to meet the changing needs of the workplace.
4. The signals of demand from the economy, government growth strategies, industrial policies, and societal needs must inform the skills strategy.
5. Given the focus on all levels of education and training, we recommend shifting the discourse from skills planning to education, training and skills development planning.
Establish the skills planning unit
6. Government must establish a dedicated skills planning unit (SPU), located within the DHET, with critical authority and resources to drive coordination and cooperation among government departments in order to estimate the skills needs of the country.
7. The unit must be given adequate budgets as well as staff with labour market economics and planning skills who are able to make sense of the relevant knowledge so as to generate regularised policy supply and demand signals to inform the education, training and skills development direction.
The skills planning mechanism
8. The skills planning mechanism must ensure the alignment and coherence between national development and what happens in education and training institutions and firms. A joined-up approach and involvement of the key stakeholders and actors are necessary for a credible and effective skills planning mechanism.
9. The skills planning process must include other government departments (economic departments, education departments, the Department of Home Affairs), key data agencies (Statistics SA) and research institutes, and business and labour.
10. The sector education and training authorities (SETAs) and the National Skills Authority (NSA) will play a critical role in skills planning and development.
Skills planning information framework
11. The skills planning information framework (SPIF) will include information on: the economic and labour market context; skills demand; skills mismatches and imbalances; and education and training labour market outcomes.
12. The following indicators will provide skills planning information: economic drivers; demographic drivers and the profile of the labour force; present, replacement and future demand measured through changes in the structure of employment and occupations; skills needed for new business and government growth initiatives; and skills supply measure through stocks and flows. Analysis of supply and demand will provide the signals regarding skills mismatches and imbalances, and information on the labour market outcomes of education and training will inform skills policy.

.../continued

Lessons for establishing the skills planning mechanism *continued...*

The contours of a skills planning mechanism ...continued
13. The data sources for skills planning will comprise administrative data sets, the mining of existing surveys, and conducting new surveys and qualitative case studies. The SPU must work closely with StatsSA and the other relevant government departments to collect data for skills planning. This can be accomplished by participating in the National Statistics System (NSS) of StatsSA.
14. The SPU must institute an enterprise survey to collect employment and training data. The Labour Market Intelligence Partnership (LMIP) pilot survey provides the template for the instruments and methodology to conduct this survey, and legislation should be introduced for SETAs to conduct these surveys biannually.
15. Skills planning should include skills forecasting models based on contextually appropriate methodologies. Projection and forecasting models must be treated as indicative only, and as complementary to detailed sectoral and occupational case studies.
16. The SPU must supplement quantitative data analysis with regular engagements with DHET branch officials, PSET institutions, and key individuals and organisations in the private sector.
Data on labour market outcomes of education and training
17. Skills planning needs data and information on access, transitions, pathways and outcomes in respect of education and training in South Africa: schooling, technical and vocational education and training (TVET), higher education, artisanal training, community colleges, workplace learning, and those not in education, employment or training.
18. The SPU must coordinate the tracer surveys of university and TVET college completers in order to collect systematic information on their workplace destinations and the employment rates of their graduates. These surveys must be mandatory and must be built into the Higher/TVET Education Act. The pilot surveys provide templates of sampling procedures, instruments, and indicators on which to report.
19. A continuing education and training management information system must be established to describe the learners who participate in this sector and to track their work destinations on completion.
20. For a better understanding of pathways and transitions through the school system, we should initially strengthen the national Learner Unit Record Information and Tracking System (LURITS), which contains the data of all learners from Grade R to Grade 12.
21. Analysis of the linked NSC–HEMIS (National Senior Certificate–Higher Education Management Information System) data sets should be conducted periodically and extended to the TVET sector (when there is better TVET data). Further, a set of indicators generated from this study must be established, and progress must be monitored over time.
22. The National Income Dynamics Study (NIDS) data should be analysed periodically for a textured understanding of the characteristics of students participating in the TVET sector. Subsequent waves of NIDS data should also be analysed for success rates.
23. The methodology and set of research instruments used for previous workplace-based learning (WPBL) studies can serve as a guideline to assess the impact of a range of WPBL programmes across the system.
24. A survey on attitudes to the labour market should be included periodically in the South African Social Attitudes Survey (SASAS). This will provide a measure of attitudes to work for the employed and the unemployed, and an index of the match between qualifications and occupations.
Key skills planning reports
25. The LMIP has developed the prototypes for each of the reports (Skills Supply, Demand and Mismatch/Imbalances in South Africa, and Occupations in High Demand in South Africa), with a proposed methodology and structure for reporting. We recommend that these reports be produced every two years on a rotational basis.
26. The key skills signal is the need for STEM-qualified professionals, associate professionals and technicians for the engineering, health and medical, and teaching fields. Further, there is a need for managers with technical qualifications.

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Nuanced insights for skills planning

The economy, employment, and education and skills

1. In order to achieve economic growth and reduce household poverty, South Africa needs labour-intensive economic growth or the unemployment rates will continue to increase. Economic growth has been driven by capital-intensive and high-skilled sectors like the retail trade and financial services.
2. The SMME (small, medium and micro-enterprises) sector is important for employment creation, economic growth and poverty alleviation, and must be prioritised.
3. There is a skills-biased labour demand trajectory but high levels of unemployment, especially for those with less than senior secondary certificates.
4. In order to leapfrog economic growth, there is a critical need to improve the quality and outcomes of the schooling, technical and vocational education, and higher education sectors.

Harmonisation between economic and skills policy

5. The case study of the New Growth Path (NGP) highlights the importance of identifying skills needed for the economic growth strategy. Skills policy should then align provision with this demand.

Education and training labour market outcomes

6. South Africa has a low achievement (though slightly improving) and unequal schooling system, leading to a PSET that is not accessible to those with poor achievement levels.
7. A strong and knowledgeable foundation in literacy and numeracy is key for future successes. School achievement in key subject areas remains the key driver of successful academic transitions.
8. Progression through the schooling system is constrained, with more than four out of ten learners experiencing considerable grade repetition, leading to interrupted pathways through their schooling careers. To improve Grade 12 passes, efforts should focus on increasing the proportion of learners who experience a smooth pathway (reduced repetition) to Grade 9. If learners have solid foundational skills, access and success through the multiple post-Grade 9 pathways to post-school educational programmes will be enhanced.
9. South Africa has a high number of unemployed youths with less than a Grade 12 certificate. Community education and training college programmes must offer these youths alternative options, but the institutional arrangements must suit the student profile (adult learners with multiple responsibilities).
10. One-third of TVET NATED completers are NEETs – which amounts to a loss of human capital. There is a sizeable proportion of NEETs who have achieved post-school qualifications.
11. The LMIP studies confirm other studies indicating that years of schooling increase employment probability, and that there is a significant premium (both as regards employment and earnings) for individuals with higher education.
12. University access in South Africa is limited, even for learners who perform relatively well in matric. Those who do gain access to university often take a long time to complete their studies, with many never completing them at all. As a result, only a select minority of matric learners obtain university qualifications. University access and university success are strongly influenced by school results.
13. For university graduates, schooling background, race, gender, and institution attended are significantly associated with the risk of unemployment. African graduates are less likely to be employed than other graduates. Women from low-quintile schools are most likely to experience unemployment. African individuals with the same institutional background still find it harder to obtain employment than similar counterparts from another race group. Graduates from historically white institutions (HWIs) are more likely to be employed in the private sector, while graduates from historically black institutions (HBIs) are more likely to be employed in the public sector. Those who study the humanities and social sciences are at a relative disadvantage when it comes to finding employment.

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Lessons for establishing the skills planning mechanism *continued*...

Nuanced insights for skills planning ...continued

Interaction and alignment between education and training systems and labour markets

14. There is attrition at all levels of the schooling system. Four of the 100 students starting Grade 1 will complete a degree six years after completing matric. These findings reinforce the concerns about the quality of instruction, the experiences in both schooling and post-school institutions, and the need for these progression rates to improve.
15. We need to better understand the interactions between firms and education and training institutions, and how they build their dynamic capabilities to engage timeously with each other. Private- and public-sector intermediary organisations, such as sectoral or professional bodies, SETAs and government entities, can play different but complementary roles in order to strengthen alignment between national policy goals and sectoral skills training needs. The DHET should recognise and support the key role of industry associations and other private intermediary organisations in skills development systems. Coordination between private and public intermediaries should be promoted so as to align skills demand and supply more effectively.
16. SETAs play a key intermediary role linking firms, PSET institutions, and other public and private intermediary organisations. The DHET needs to strengthen the interactive capabilities of SETAs so that they can build the partnerships and networks that are so critical to successful skills planning and development.
17. The mismatch between industry needs and the educational outcomes of the PSET system points to a potential lack of curriculum responsiveness for enhancing the employability of graduates. The research in universities, colleges and private training institutions has demonstrated that curriculum responsiveness is a complex interplay of multiple factors, and not a simple correspondence between employer needs and the curriculum. In order for vocational or occupational programmes to be effective, they need to remain responsive to a range of issues, including, but not limited to, the needs of employers, shifts in technology, and the needs of students. A tension exists between pressure to be responsive to these diverse factors, and the need for standardisation, transferability, and quality assurance measures that result in the codification and centralisation of curriculum processes. Multiple role players have a direct role in curriculum processes.

Work change and its implications for skills needs

18. We must deal with the negative historical discourses underlying artisanal training by positively re-imaging the TVET sector.
19. The planning for artisanal (and other occupational) skills must move beyond occupational classifications and place the trade, field of practice, sectoral and national labour market context at the centre of its approach. Interventions aimed at addressing the skills development needs of a particular occupation have to draw on a clear investigation of the drivers of demand in the particular industry sector and the particularity of firms constituting that sector, as well as interrogate not only how work itself is changing, but also the impact of such changes on the skills required to practise that occupation.

Next steps for the Labour Market Intelligence Partnership

20. The DHET must start by establishing the education, training and skills development (skills) planning unit, which must then formalise the processes for estimating the skills needs of the country.

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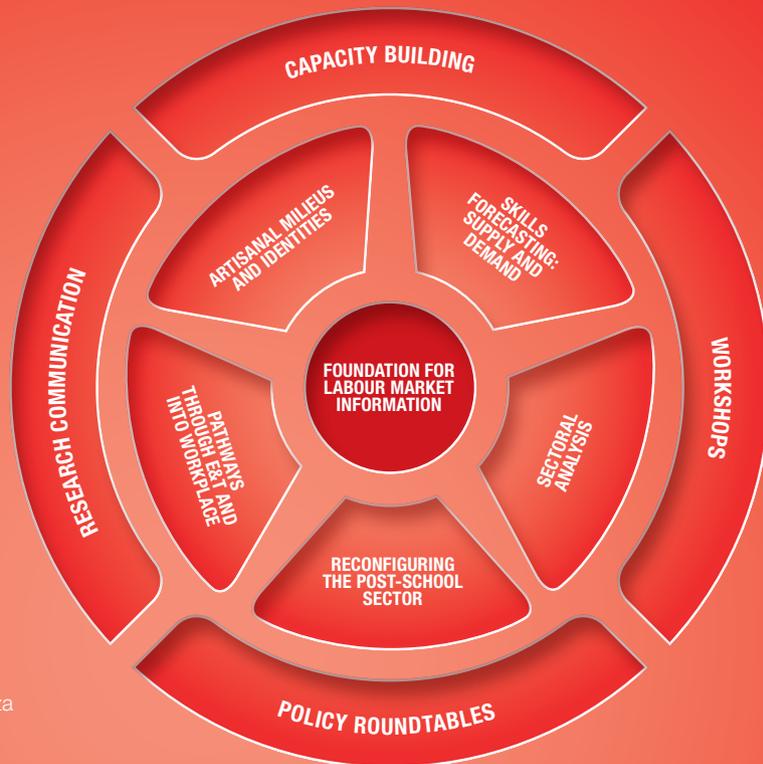
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Abbreviations and acronyms

AET	adult education and training
CET	community education and training
CIPC	Companies and Intellectual Property Commission
CSPS	community, social and personal services
DBE	Department of Basic Education
DHA	Department of Home Affairs
DHET	Department of Higher Education and Training
DoL	Department of Labour
DPME	Department of Planning, Monitoring and Evaluation
dti	Department of Trade and Industry
ECD	early childhood development
EMIS	Education Management Information System
GDP	gross domestic product
GHS	General Household Survey
HBI	historically black institution
HEMIS	Higher Education Management Information System
HETIS	Higher Education and Training Information System
ICT	information and communications technology
LM-EM	Linked Macro-Education Model
LURITS	Learner Unit Record Information and Tracking System
MEMSA	Macro Education Model for South Africa
MerSETA	Mechanical, Engineering and Related Services Sector Education and Training Authority
MTSF	Medium Term Strategic Framework
NATED	National Accredited Technical Education Diploma
NC(V)	National Certificate (Vocational)
NDP	National Development Plan
NEET	not in education, employment or training
NGP	New Growth Path
NIDS	National Income Dynamics Study
NPC	National Planning Commission
NQF	National Qualifications Framework
NSA	National Skills Authority
NSC	National Senior Certificate
NSFAS	National Student Financial Aid Scheme
NSS	National Statistics System
OECD	Organisation for Economic Co-operation and Development
OIHD	occupations in high demand

PALC	public adult learning centre
PSET	post-school education and training
QLFS	Quarterly Labour Force Survey
REAL	Centre for Researching Education and Labour (University of the Witwatersrand)
SARB	South African Reserve Bank
SASAS	South African Social Attitudes Survey
SAYPS	South African Youth Panel Survey
SET	science, engineering and technology
SETA	sector education and training authority
SKA	Square Kilometre Array
SMMEs	small, medium and micro-enterprises
SPIF	skills planning information framework
SPU	skills planning unit
SSP	Sector Skills Plan
StatsSA	Statistics South Africa
STEM	science, technology, engineering and mathematics
TES	temporary employment services sector
TIMSS	Trends in International Mathematics and Science Study
TVET	technical and vocational education and training
TVETMIS	Technical and Vocational Education and Training Management Information System (TVETMIS)
WPBL	workplace-based learning
WSP	Workplace Skills Plan



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