Volume 15 Number 3 • July – September 2016

REVIEW

Skills to support the goverment's growth strategies
Page 5

Smooth, staggered or stopped? Educational transitions among the youth
Page 15

Higher education and economic development: Building interactive capabilities
Page 43

Bridging the skills gap

HSRC
Human Sciences Research Council

Contents

News roundup	1
LMIP	
– Introducing research on the labour market information	4
– Skills to support the government's growth strategies	5
– Open and effective data systems for skills planning in South Africa	8
– A high level audit of administrative datasets in government departments	10
– Working with South Africa's employment services – employers' experiences	12
– Smooth, stagged or stopped? Educational transitions among the youth	15
– Tracing graduates into the labour market	18
– More than wages: The gap between expectations and experience	21
– Perceptions of qualification mismatches: A balancing act	24
– Inequality in artisanal employment: A persistent challenge	27
– Artisans and technicians in South Africa: What the future holds	30
– Structural inequality still characterise work in the mining sector	34
– Connecting capabilities to reach the global science and technology frontier	37
– Bridging skills: Demand and supply in South Africa: the role of intermediary organisations	40
– Higher education and economic development: Building interactive capabilities	43
The HSRC Press	46

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Editor's note

Guiding labour market information

Ina van der Linde

In this HSRC Review look out for the special section on some of the findings emerging from a mammoth four-year study, the Labour Market Intelligence Partnership Research Project (LMIP), that provides 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.

Project leader Dr Vijay Reddy relates the background: In 2012 the Department of Higher Education (DHET) requested that the HSRC lead a team of researchers to conduct appropriate research 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 the human resources development needs of our country'.

The HSRC promised high quality science leading to information, knowledge and appropriate labour market intelligence. This project involved collaborations among many researchers and institutions, and engagements with government and other social actors involved in the skills arena. The LMIP has become a brand synonymous with skills planning in South Africa.

The National Development Plan, designed to respond to the country's triple challenges of poverty, inequality and unemployment, includes as its priorities plans to raise employment through faster economic development and to improve the quality of education, skills development and innovation. Embedded within these priorities is the requirement for the government to anticipate and respond to the country's skills needs.

This investment to establish a credible skills planning mechanism for South Africa is very important for a number of reasons: Firstly, a well-designed skills planning mechanism will provide better understanding of the supply and demand of skills at both intermediate and professional levels. Secondly, the mechanism could support government's economic development strategy and target resources to education and skills areas in most need and thus tackle skills shortages.

Thirdly, it will provide credible information to direct government resources at those skill areas where people are likely to find employment and thus tackle unemployment. Fourthly, it could improve South Africa's economic competitiveness and contribute to poverty alleviation.

The LMIP conducted a number of research studies to understand, in greater depth, the supply 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 ways in which both could be connected. Our approach was that we needed to build on, adapt and consolidate what we already have, rather than starting afresh. We reviewed past South African and international practices and extracted lessons that could be applied to the proposed skills planning mechanism. We had extensive engagements: firstly, with the relevant directorates in the DHET; and then, through a series of policy roundtables, with other government departments, SETAs, academic institutions, business and professional organisations.

The LMIP proposes an inclusive socioeconomic skills planning approach for South Africa. In this approach we need to read the signals of demand from the economy, government growth strategies and trade and investment policies. In addition, we need to focus on raised levels of basic and post-school education and training in the country. South Africa will follow this unique approach to reflect our country's present and future needs as well as our historical circumstances.

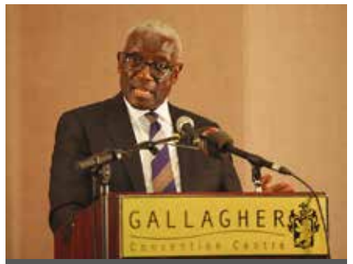
From this, LMIP was born. We hope our scientific endeavours contribute to improving skills development in our country.

After 10 years as editorial advisor to the *HSRC Review*, we are bidding farewell to Professor Dan Ncayiya, with heartfelt gratitude for his support, wisdom, prudence, and good judgment during this period.

With regards
The Editor

News roundup

Constitutional democracy must lie in our hearts



Former Constitutional Chief Judge Sandile Ngcobo.

'A constitution in and of itself guarantees nothing. A constitution must embody something that is in the hearts of the people,' said former Constitutional Chief Judge Sandile Ngcobo at an HSRC public lecture that took place at Gallagher Estate on 30 June. His subject: 'Why the Constitution matters'.

'Constitutional democracy and the values that it embraces must lie in our hearts; if it dies there, no constitution, no law, no court can do much to save it.'

'The people of the country should debate issues that threaten the constitutional democracy or those that will strengthen it, regardless of how controversial they may be,' Ngcobo said.

'Public debate does not undermine democracy; it enhances it. Public debate promotes a better understanding of the role of each of the three arms of government and reinforces what our responsibilities are as citizens. The value of debate lies in its ability both to vindicate our point of view and to demonstrate that our view is erroneous.'

South Africa cannot save its constitutional democracy unless the country creates a nation of people committed to this form of government and is willing to stand up to save it.

'Our Constitution created it. Saving it is up to us. We must remember that the sustainability of our constitutional democracy does not only depend on the rules and procedures that we have adopted in the Constitution, but it crucially depends on the way we use the opportunities that our democracy provides.

'The challenge we face therefore is to make our Constitution work not for a few, but for all,' Ngcobo concluded.

Read the full paper on http://bit.ly/2aYHXEl

Fifth national household survey on HIV to begin

The preparations for the fifth South African National HIV, Behaviour and Health Survey 2016 to go into the field is in process, under the theme 'Measuring Impact and Progress'.

The 2016 survey is the fifth in the series of national HIV household surveys conducted by a consortium of scientists led by the HSRC, including the National Department of Health, the Medical Research Council, the US Centers for Disease Control and Prevention, and others.

The first of these longitudinal surveys was conducted in 2002, followed by surveys in 2005 and 2008. These surveys collected data on the HIV status of individuals, but also information on socio-demographic and behavioural factors that greatly enhanced the analysis and interpretation of the observed trends in HIV prevalence (the proportion of people living with HIV in the country) and HIV incidence (new HIV infections in a given year). It also includes methods that will provide the direct estimates of HIV incidence and exposure to antiretroviral treatment (ART). This survey data, as others before it, will serve as critical benchmark figures for the evaluation of the National Strategic Plan on HIV, STIs and TB.

President Nelson Mandela launched the first National HIV Household survey report in 2003.

Read more on http://bit.ly/2aUUOdS

News roundup

Exclusive breastfeeding and early stimulation spells success in later life

New studies further strengthen scientific understanding of the links between what a child experiences in the first years of life and later childhood behaviour and abilities.

Funded by the Government of Canada through Grand Challenges Canada, researchers working in South Africa and Pakistan report their findings in papers launched 21 June 2016. Dr Tamsen Rochat, a chief research specialist in the Human and Social Development research programme at the HSRC, was one of the investigators in this project.

In the first study, the researchers assessed over 1 500 children in South Africa, 900 of whom had been involved in an early infant feeding study. They found longer durations of exclusive breastfeeding strongly associated with fewer conduct disorders at ages seven to 11 years. Children exclusively breastfed for the recommended six months, compared with those exclusively breastfed for less than one month, were approximately half (56%) as likely to have conduct disorders at primary school age.

Children being assessed for executive functioning skills.
Credit: School Transition and Readiness Project, Department of Paediatrics and Child Health, Aga Khan University.

Other highlighted findings, published in PLOS Medicine, included:

- Important determinants of a child's cognitive development: attending crèche (preschool) and mother's IQ;
- Children who attended crèche for at least one year were 74% more likely to have higher executive function (which enables us to plan, focus attention, remember instructions, and juggle multiple tasks successfully. The brain needs this skill set to filter distractions, prioritise tasks, set and achieve goals, and control impulses. Executive function, therefore, influences educational and social success);
- Children stimulated at home, such as through play, were one third (36%) more likely to have higher executive function scores; and
- There was weaker evidence that, for boys, exclusive breastfeeding for more than one month improved cognitive development.

Peter Alexander appointed as HSRC research fellow

Peter Alexander, Professor in Sociology and research chair in social change at the University of Johannesburg, has been appointed as the first honorary research fellow in the Democracy, Governance and Service Delivery research programme, headed by Professor Narnia Bohler-Muller.

Alexander obtained a PhD in 'Industrial Conflict, Race and the South African State, 1939 – 1948' from the Institute of Commonwealth Studies, University of London. From 2010: South African Research Chair in Social Change (funded by the Department of Science and Technology and administered by the National Research Foundation).

His most recent publications were *Marikana: Voices from South Africa's Mining Massacre*; and *Marikana: A View from the Mountain and a Case to Answer*.

Peter Alexander

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News Roundup

News roundup

R&D expenditure increases in SA for third consecutive year

The latest Research and Development (R&D) survey (2013 – 2014) shows that gross expenditure on research and development (GERD) has increased in nominal terms in South Africa for the third consecutive year after the contraction in the 2009 – 2010 and 2010 – 2011 survey years.

This is an indication that the R&D expenditure trend has stabilised. The report says that these trends reflect the general pattern of domestic economic growth and track the global trend in R&D expenditure.

While the results show an improving outlook for R&D investment in the country, the magnitude of annual real increases in GERD still appears inadequate. Increases did not keep pace with the real GDP growth over the four years 2010 – 2013 and this is why R&D intensity has remained constant at 0.73%.

The report states that from a policy view, R&D should expand at a faster rate than economic growth if South Africa is to significantly improve its competitiveness.

The Department of Science and Technology commissions the HSRC to conduct the annual survey of National Research and Experimental Development inputs, according to the guidelines laid down in the Frascati Manual. The 2001 – 2002 survey constituted the first official survey since that of 1997 – 1998. Following the Frascati Manual, the survey covered business enterprises, government, higher education institutions, not-for-profit institutions and science councils.

The R&D survey is undertaken by the Centre for Science, Technology and Innovation Indicators housed at the HSRC and annually collects data that is used to produce statistics of R&D activities in South Africa. The statistics are used in the development of science policy to set government R&D priorities and funding levels, and for monitoring and benchmarking purposes.

The 2001 – 2002 survey constituted the first official survey since that of 1997 – 1998. Following the Frascati Manual, the survey covered business enterprises, government, higher education institutions, not-for-profit institutions and science councils.

The full report is available at http://bit.ly/2aNCRxr

HR strategy for tourism

The National Department of Tourism and the Culture, Arts, Tourism, Hospitality and Sport Sector Education and Training Authority commissioned the HSRC to develop a new strategy for human resource development in the tourism sector in South Africa.

The study will be done among education and training providers operating in the tourism, hospitality and conservation sectors with the aim to understand the role and contribution of this stakeholder group to skills development and what it does to ensure that workers in the sector are appropriately skilled. The information will be used to develop a multi-year plan for upskilling workers in the tourism sector over the next 10 years from 2016 – 2026.

Read more on http://bit.ly/2aUUOdS

INTRODUCING RESEARCH ON THE

labour market information

Dr Vijay Reddy, executive director of the Education and Skills Development programme and LMIP project leader.

The Labour Market Intelligence Partnership (LMIP), a consortium led by the HSRC, was established in 2012 to drive a research agenda to inform government's goal of building a centralised institutional mechanism for skills planning, to promote an inclusive growth path.

Skills planning up to that point tended to be fragmented and uncoordinated. The Department of Higher Education and Training (DHET) began a process to improve data on education and training supply in universities, colleges and private providers, but lacked data on labour market demand. **Marc Kalina** and **Mike Rogan** (page 5) show that government growth strategies need to incorporate a more realistic skills planning process, if implementation plans are to be effective.

The initial focus was therefore research to identify the core datasets that could be used to build a labour market information system. **Lynne Woolfrey** (page 8) provides a bird's eye overview of what exists nationally. Mariette Visser reports from an audit of the quality and utility of administrative datasets across cognate government departments, that there is much to be done before such data can be useful. **Fabian Ahrends** (page 12), spotlights the Employment Services South Africa database maintained by the Department of Labour, and recommends how it can be made more valuable for skills planning at the basic and intermediate skills levels.

It became clear that there is a major skills planning gap in South Africa, in terms of labour market information: we have few frameworks and datasets to measure the mismatch between supply and demand. LMIP researchers therefore created new datasets, proposing how they can be institutionalised in future. **Katherine Isdale** and **Vijay Reddy** (page 15) describe a first attempt to trace young people's trajectories through the last phase of schooling, and how this shapes their trajectories into further study or the labour market. Mike Rogan discusses research to inform a national graduate tracer study in higher education, which can be sustained over time to create time-series data for skills planning. On pages 21 and 24, **Bongiwe Mncwango** develops a new dataset on public perceptions of work, to provide information on the attitudes of the employed and the unemployed, critical to take into account for skills planning.

To address a second major gap – providing much needed labour market intelligence – LMIP teams researched mismatches in the South African context. One team conducted qualitative studies of the changing nature of artisanal work and occupations, and the impact on education and training. In an article based on the work of **Jeanne Gamble** (page 31) provides a future-oriented lens, researching what will be required of artisans in the future in four sectors, and shows how this can inform skills development and training. **Angelique Wildschut** and **Tamlynne Meyer** (page 27) show how, despite shifts towards more equitable racial and gender representation, workplace cultures and dynamics continue to constrain opportunities to participate in artisanal occupations along gender, race and language lines.

A second team examined how firms, government and education and training organisations can match supply and demand more effectively. **Glenda Kruss** and **Il-haam Petersen** (page 41) explore the critical role that public and private intermediary organisations play in linking skills supply with demand in specific sectors and regions. Glenda Kruss and Il-haam Petersen also show how higher education institutions can develop the capabilities to interact with firms, and respond to skills demand more effectively, in ways that are mutually beneficial.

There is much more LMIP research, and the full reports on which these articles are based available on the project website, www.lmip.org.za

Skills to support the government's growth strategies

In an effort to stimulate economic development and reduce unemployment by creating jobs, the government has initiated a number of sectoral and regional growth strategies. *Marc Kalina* questions whether these strategies have sufficiently considered and planned for the skills needed for successful implementation and their implications for the nation's skills base.

Our research explored the potential disconnect between strategies and implementation through an assessment of the skills demand implications of government's economic development policies. The main objective was to generate a broad estimate of the skills required to implement national, provincial and metropolitan municipality development strategies, including programmes that are specifically designed as job-creating projects. What are the current and future skills needs of South Africa's development strategies and at what levels – high, medium or low?

A review of development strategies

We conducted a review of 27 development strategy documents from the national and provincial governments and from the major metropolitan municipalities. The table below focuses on the main growth strategies, describing the disciplinary and occupational domains and levels of skills required. It also summarises specific skills targets provided, if any.

Table 1. Skills demand to implement key national growth strategies

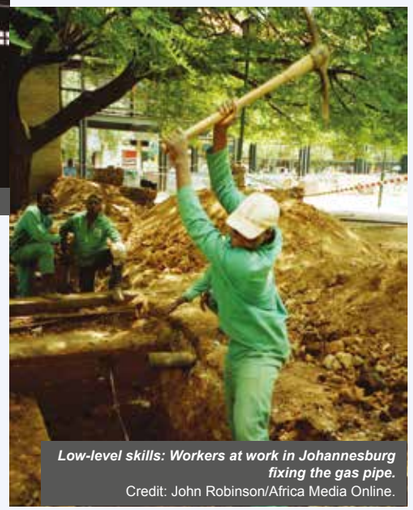
Policy document	Domain of skills required	Skills level	Specific skill requirements
Department of Rural Development and Land Reform Strategic Plan 2015 – 2020	Geometric and spatial planning skills	High	Unspecified
Department of Trade and Industry Strategic Plan	Unspecified	Unspecified	Unspecified
Human Resource Development Strategy for South Africa (HRD-SA) 2010 – 2030	Skills in the priority areas of design, engineering and artisanship, particularly those that are critical to the manufacturing, construction and cultural industries	High	Unspecified
Industrial Policy Action Plan	Technical and high-level design skills for manufacturing Skills across the plastics value chain Broad-based skills within the sawmilling industry	High, medium, low	Unspecified
Innovation Towards a Knowledge-Based Economy, Ten-Year Plan for South Africa (2008 – 2018)	Science, engineering and technology	High	3 000 SET PhDs graduated in South Africa per year.

Policy document	Domain of skills required	Skills level	Specific skill requirements
Medium-term Strategic Framework	Artisans PhD graduates in engineering, science, and human and animal health Natural and physical sciences Teacher graduates	High, medium	24 000 per annum by 2019 (Artisans) 2 400 per year by 2019 (Engineering PhDs) 57 000 over the five-year period (Science PhDs) 45 000 over the five-year period (Human and Animal Health PhDs); 36 000 over the five-year period (Natural and Physical Sciences PhDs) 20 000 by 2019 (Teacher graduates)
National Department of Tourism Strategic Plan	Unspecified	Unspecified	Unspecified
National Development Plan	Labour-intensive services and industry	Mainly low, but also some medium and high skills	5.9 million by 2020 and 11 million by 2030
National Skills Development Strategy III	Unspecified	Unspecified	Unspecified
New Growth Path	Positions within the manufacturing industry. Otherwise unspecified. Some demand in the services sector for finance, public administration, and business management skills	High, medium, low	330 000 low-skilled, 860 000 medium-skilled, and 13 000 high-skilled openings
Operation Phakisa: Unlocking the Economic Potential of South Africa's Oceans	Ocean governance and environmental management	High, medium, low	Unspecified, expects to generate 1 million new jobs by 2033
South African National Infrastructure Plan	Job creation in construction, supply and productive sectors. Skills demand in engineering, planning, architecture, and public administration	High, medium, low	Shortages in 90 OFO occupations, 35 of which were in the SET fields: five were in management, 30 for professions, 14 for technician and associate professionals, two for services and clerical, 16 for tradeworkers, seven for plant or machine operators, 16 for elementary workers
South African Tourism Strategic Plan	Unspecified	Unspecified	Unspecified
Support for Astronomy and the SKA Facility	Job creation at the SKA facility in the capacity of planning, construction, installation of technical equipment, software development, maintenance, and astronomical research.	High	Unspecified
Youth Enterprise Development Strategy	Entrepreneurial skills, business management	Medium, low	Unspecified

Source: Kalina, M. and M. Rogan (2016).

Engineer performing a highly-skilled task.

The challenge to the state is to generate highly qualified individuals, while at the same time creating low-wage jobs.



Low-level skills: Workers at work in Johannesburg fixing the gas pipe.
Credit: John Robinson/Africa Media Online.

Growth strategies are generally clear about the types of jobs to be created but less explicit about the skills needed to fill these positions.

Skills demand implications neglected

The analysis revealed that the South African government is interventionist regarding unemployment. Growth strategies to create jobs and grow the economy are generally clear about the types of jobs to be created but less explicit about the skills needed to fill these positions.

Few national development strategies provided accurate assessments of the number of jobs to be created and the skills required to fill them. Moreover, those that do provide assessments, like the National Development Plan (NDP) or the New Growth Plan (NGP), provide estimates which seem unrealistic; or do not reveal the methodological guidelines used in these assessments.

The review therefore confirmed that most national development strategies do not adequately consider the implications of their plans for the nation's skills base, threatening the achievement of government's developmental goals.

A simultaneous demand for high and low-level skills

Where growth plans do provide some indication of their skills requirements, gaps largely exist in low-skill occupations, like those demanded in the productive industries, or in high-skill applications, like those required by SET industries or within the knowledge-based economy. The challenge to the state is to generate highly qualified individuals, while at the same time creating low-wage jobs.

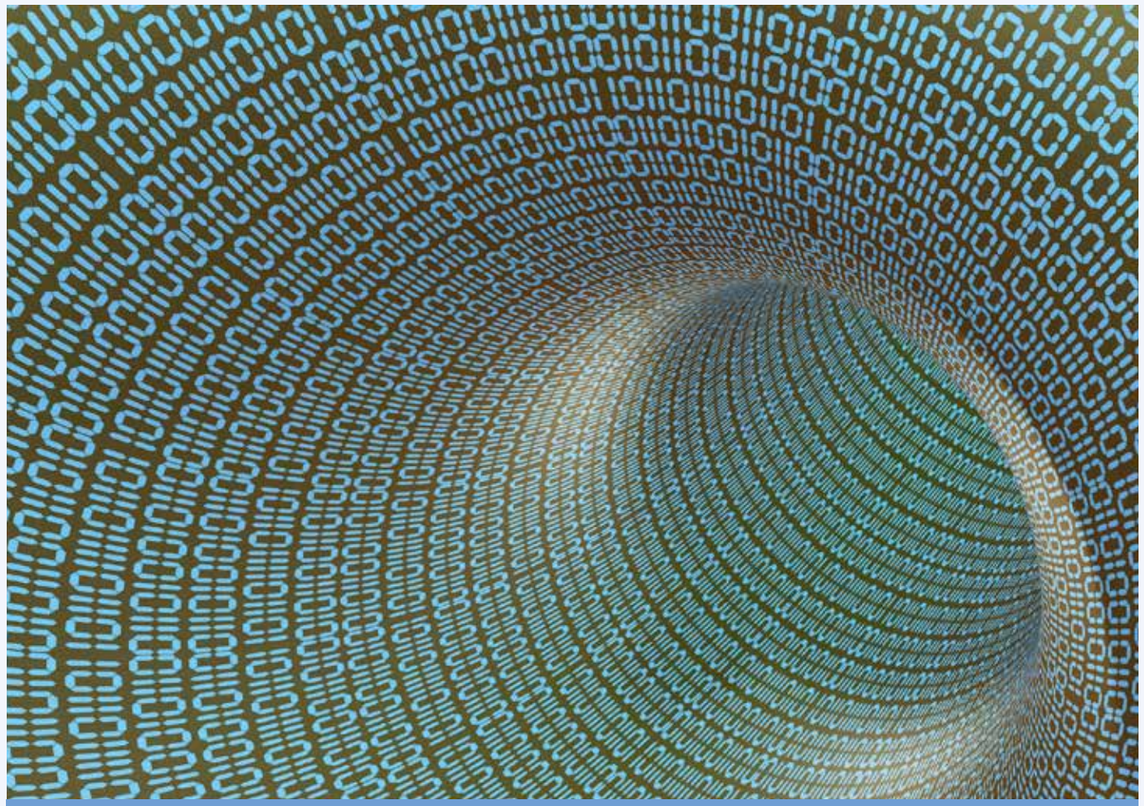
Our survey found that the state is attempting to do both. It also clearly showed that the number of low-wage jobs which are to be created are not enough to adequately respond to South Africa's unemployment crisis.

Matching skills demand to achieve national development strategies with current and future skills supply remains a major hurdle towards reducing unemployment and increasing productivity in South Africa. Moving forward, it is imperative that when job creation plans are generated, the plans must include an accurate and realistic estimate of skills requirements. Such forecasts need to be aligned with skills planning processes at the national, regional, and local levels.

Author: Marc Kalina, PhD candidate and research consultant, University of KwaZulu-Natal

The article is based on Kalina, M. and M. Rogan (2016). *Estimating the current and future skills demand of government's national growth and development policies,* available on http://www.lmip.org.za.

Open and effective data systems for skills planning in South Africa



The starting point to build a credible institutional mechanism for skills planning in South Africa is to evaluate existing datasets and information systems. What are the sources of micro-data available for the analysis of supply and demand in the South African labour market? What is the state of 'usability' of skills-related datasets that may exist across government departments? *Lynne Woolfrey* and *Mariette Visser* address these technical questions, and provide important insights for policy-makers and researchers across government.

Micro-data[1] provide critical evidence to inform skills planning. An early LMIP study mapped the wide range of labour market and skills planning-related data maintained by government, research, education and NGO institutions, available in the public domain and on the world-wide web. To be as comprehensive and relevant as possible, the study included data sources from 1993 to February 2013.

Survey data sources

Labour market survey micro-data can be obtained from two sources: data producers and dedicated data distributors. National data distributors are part of data support networks in many countries. National statistics offices and research organisations provide the institutional capacity for national data management, including the sharing of national data for research purposes. These include national survey data archives and university-based research data centres.

Producers of South African skills-relevant micro-data include Statistics South Africa (StatsSA), government bodies, survey projects of South African and other universities and research institutes, as well as international donor organisations collecting data for project development and monitoring. In general, survey data in South Africa are available within the public domain. One exception is private sector organisations that conduct surveys for paying clients, so that the data are generally not freely available for reuse.

Data producers who also distribute their data include StatsSA, university-based survey projects and the Human Sciences Research Council (HRSC). The data is available from the two dedicated data distributors in the country, the South African Data Archive (SADA) and DataFirst.

[1] *Micro-data represent observed or derived values of certain variables for certain objects. The data are collected at an individual, household or institution level.*

Administrative data sources

Government departments and other entities collect administrative data in the course of their administrative functions. These functions are often regulated by national laws or regulations to generate all data necessary for administrative processes, including data on people, events and transactions. Computerised administrative systems allow for automated collection and collation of records at unit record level, and in theory should expedite the sharing of data within government and with academia.

In South Africa, administrative records at micro level are not automatically made available to researchers or government entities. Instead, aggregated data is published in annual reports, other publications and websites. Requests for data from administrative databases are either declined or handled on a case-by-case basis. Decisions are justified by confidentiality concerns aligned with the Protection of Personal Information Act.

The need for open and effective data management systems

Onerous requirements for data access restrict usage and limit the benefits of knowledge utilisation. Such barriers waste scarce national resources: they prevent reuse of data by researchers for policy analysis to aid skills planning, or to provide innovative input for economic growth. Furthermore, such restrictions deprive government monitoring and evaluation divisions of valuable input from the research community, on data quality and analysis.

The reasons for poor data sharing are primarily rooted in government decision-makers' limited understanding of the value of a data-rich research-policy interface to assist national planning. Government departments also suffer from time and human resource constraints, limiting their capacity to adequately curate the data collected. The paucity of effective data management systems within government requires urgent attention.

Finally, South Africa still lacks a large enough cadre of researchers with the quantitative skills to analyse the data and who could constitute a pressure group for more open data access.

Authors: Lynne Woolfrey, manager, DataFirst Research Data Service, University of Cape Town; Mariette Visser, research manager, Education and Skills Development (ESD) programme, HSRC.

The full report, Lynn Woolfrey (2013) *South African Labour Market Microdata Scoping Study. Labour Market Intelligence Partnership Working Paper 2,* is available on www.lmip.org.za

South Africa lacks a large enough cadre of researchers with the quantitative skills to analyse the data and who could constitute a pressure group for more open data access.

A high level audit of administrative datasets in government departments

Government departments create many administrative datasets and commission survey studies, some of which contain potentially useful information about skills supply and demand, but these are restricted in access and use, hidden deep inside government departments. *Mariette Visser* explains the importance of these resources and suggests an inter-government initiative to encourage better knowledge and usage of administrative database resources.

The LMIP conducted a large-scale 'audit' across government, to identify and trace administrative datasets potentially relevant to skills planning. The existence of an administrative dataset however, does not tell us anything about how relevant and useful it is for skills planning purposes or whether the quality of the data is reliable.

Methods

More than 20 government departments participated in the study. The first step was to contextualise the work of each department by analysing their mandates, objectives, institutional structures, operational arrangements, administrative systems and data holdings. The second step was face-to-face interviews with the managers and users of these databases. The purpose was to assess whether the database or particular variables are of sufficient value and use.

Data was assessed as good quality if it was deemed 'fit for their intended uses in operations, decision making and planning'.

Few databases immediately usable

Few of the datasets were of sufficient quality to be used, and a long-term approach to improving database sources will need to be pursued.

Datasets that are relevant and immediately usable include: the Unemployment Insurance Fund (UIF) database of the Department of Labour, the Strategic Integrated projects (SIP), datasets from the South African Qualifications Authority (SAQA), and datasets of the South African Revenue Service (SARS).

Some databases contained data relevant to skills planning but were not sufficiently developed to be used immediately. Time should be allowed for these to mature to show consistent levels of quality and accumulate a sufficient number of records to justify inclusion in a skills planning mechanism. Examples of these databases with potential included: the Employment Services of South Africa (ESSA) database in the Department of Labour; the Farmer's Register in the Department of Agriculture, Forestry and Fisheries; and the National Population Register in the Department of Home Affairs.

Data was assessed as good quality if it was deemed 'fit for their intended uses in operations, decision making and planning'.

A long-term data development approach is needed

Of concern is that government databases holdings were for the most part detached and uncoordinated:

- The culture of inter-department mutual access and data sharing is not well developed.
- Awareness of data and databases as a vital asset for planning needs to be strengthened.
- Staff have a limited knowledge of what data their department owns, and which units generate and own datasets.

Pursuing a developmental approach towards government data systems, and engaging with the National Statistics System (NSS) will generate mutual benefits.

How to improve skills planning databases across government

We recommend that the Department of Higher Education and Training (DHET) engages with other government departments for data to inform skills planning. However, clearly, this can only work as part of a national inter-government initiative to encourage better knowledge and usage of administrative database resources.

Of concern is that government databases holdings were for the most part detached and uncoordinated.

Database policies to improve DHET's holdings can be introduced in the short term:

- Continue to map available data in government, compared with a schedule of datasets required, so that new database development can be prioritised and scheduled.
- Explore ways of improving current datasets held by other departments, by applying the concept of the database life cycle, with a view to using these data resources in the future.
- Strengthen awareness of data and databases as a vital asset for planning.

Most significantly, in the long term, DHET database units will need to collaborate within the National Statistics System (NSS). There is an urgent need to:

- improve the visibility of data among policy makers, researchers and managers;
- support the functioning of research and database units based in departments;
- ensure data personnel are familiar with cognate databases; and
- initiate and support improved linking and sharing of data between departments.

Authors: Mariette Visser, research manager, Education and Skills Development (ESD) programme, HSRC.

The full report, Paterson A, Visser M, Arends F, Mthethwa T, Twalo T, Nampala T, (2015) High-Level Audit of Administrative Datasets is available on www.lmip.org.za

Unemployed job seekers at an iSithebe border industry factory. KwaZulu-Natal 1983
Credit: Nunn/Africa Media Online

Working with South Africa's employment services – EMPLOYERS' EXPERIENCES

A study on employers' experiences and attitudes to the Employment Services of South Africa (ESSA) recommends the introduction of a far more sophisticated online ESSA platform and better coordination with the Department of Labour, writes Fabian Arends.

Public employment services (PES) represent key labour market policy instruments that governments all over the world use to facilitate employment. Their core function is to match job seekers with employers by facilitating access to and information sharing between organisations with vacancies and people seeking gainful employment.

In South Africa, the Employment Services of South Africa (ESSA) have been designed to play this vital intermediary role.

In a recent study, we analysed a survey which canvassed employers' attitudes to, interactions with and experiences of ESSA. The survey was supplemented by interviews with managers of ESSA labour centres and a brief desktop study to place the South African experience in an international context.

Employers' use and perceptions of ESSA

In terms of the scale of use, a number of salient results emerged from our survey. For recruitment purposes, employers use ESSA as one of several channels, ranging from the formal to the informal.

A slight majority of respondents (50.6%) do not post all their vacancies on ESSA. Employers also perceive ESSA to be mainly a source of information about intermediate and low-skilled workers. Public entities, which are required to list all their vacancies on ESSA, predominantly need to recruit high and intermediate-skilled workers, but ESSA has limited capacity to respond to this need, as the majority of work seekers are at intermediate and low-skilled levels.

In terms of the effectiveness of job matches, we observed that the majority (56%) of successful matches made through ESSA result in long-term placements.

In terms of employer perceptions of future improvements, employers who participated in the survey were accustomed to accessing ESSA services online via labour centres. However, employers signalled the need to improve the system through assisting work seekers to prepare for job searches and interviews. According to the employers, this can be achieved through programmes to improve employability, and by screening of candidates.

These trends lead us to explore how these patterns of employer behaviour impact on the quality of ESSA's administrative data and, by extension, its utility for skills planning.

Value of employment services for skills planning

Our research suggests that the ESSA system should remain committed to low-skilled worker hires. The system already has a preponderance of low-skilled vacancy registrations and work seekers, and has proven less effective in addressing medium or high-skilled vacancies. A focus on job placements for those who are most vulnerable is a critical role for ESSA.

If ESSA generates quality data in this regard, it can inform skills planning for the unemployed — a dimension that is often neglected in favour of a focus on forecasting, shortages, scarce and critical skills.

To ensure more effective data, the introduction of a far more sophisticated online ESSA platform is highly desirable. Many ESSA clients have access to the technology necessary to utilise such a system, which could also create substantial savings in transaction costs while improving the ability to monitor employment data.

It is however, important to note that many potential users do not have access to computers, and few labour centres have their own workstations that clients can use. It is critical, therefore, that information generated at labour centres is captured electronically on the ESSA electronic platform. This will ensure the consistency, accuracy and validity of labour market information generated through the ESSA platform.

The Employment Services of SA (ESSA) system and skills planning

Reporting to the Department of Labour (DoL), the ESSA system is located in formal ESSA labour centres across South Africa. A centralised ESSA database comprises vacancy and work seeker information, which is either uploaded onto the system at the centres, which clients can physically visit (the predominant practice), or accessed through the less popular ESSA website.

While the ESSA system is still in its development phase, in theory it should fulfil two major skills-planning and employment functions:

- Contribute substantially to match labour demands with supply through acting as a formal intermediation mechanism. To this end, the success of the ESSA service depends on increasing the number of job opportunities and work seekers registered across the spectrum of occupations, from low-level to intermediate and high-level skills.
- Depending on the quality of the information on the system, ESSA data should offer skills planners important insights into the specific characteristics and activities of the user population.

The success of the ESSA service depends on increasing the number of job opportunities and work seekers registered across the spectrum of occupations

What makes a successful Public employment services (PES): International comparisons

We investigated models of PES provision from the United Kingdom, Singapore, Brazil and the Philippines. The models we selected were not intended to serve as templates for South African conditions; rather, they represent the divergent experiences of the selected countries, and offer lessons that may be absorbed by the local system in seeking to improve the service. Comparisons with other countries are useful, but it is important to distinguish between learning from principles and copying models mechanistically without taking context into account.

Four key observations can be extracted from our comparative analysis:

- The introduction of online portals does not render walk-in centres redundant. Walk-in centres are still an essential vehicle for the delivery of various PES.
- PES job matching is most successful in environments where structural or long-term unemployment levels are relatively low. Deep-seated, structural labour market disequilibria call for strategies to support alternative or informal employment initiatives.
- Some countries have linked the delivery of PES to the administration of unemployment benefits in different arrangements, with different effects.
- Measuring the effectiveness of PES remains a challenge for almost all countries. In the end, perception surveys of users may be the most reliable measure of effectiveness.

In the South African context, we experience persistent high levels of structural unemployment. It is therefore significant to establish whether and how employers use the ESSA system as a favoured recruitment channel.

Job matching is most successful in environments where structural or long-term unemployment levels are relatively low.

Greater coordination with the DoL is also desirable. Cooperation between DoL and the Department of Higher Education and Training (DHET) institutions would add value to ESSA services. Areas for cooperation could include a shared strategy for the ESSA system, and plans for the sharing of employment data generated through ESSA, which could help to identify appropriate target groups for skills upgrading.

Finally, ongoing research on ESSA trends would be valuable. Future research should monitor changes in the employers who use ESSA, their employment needs and their opinions on services rendered.

A focus on job placements for those who are most vulnerable is a critical role for ESSA.

Going forward

Public employment services such as ESSA should generate potentially valuable and relevant administrative information about labour market demand and supply that can be used for skills planning. The quality of service that ESSA offers depends on the integrity of the captured data. Ideally, high-quality service and data will improve rates of matching which will, in turn, attract increased employer and worker participation consequently improving national skills-planning capacities.

Authors: Fabian Arends, senior research manager, Education and Skills Development (ESD) research programme, HSRC.

The full report, Fabian Arends, Sybil Chabane, Andrew Paterson (2015) *Investigating Employer Interaction with the Employment Services of South Africa (ESSA),* is available on www.lmip.org.za

SMOOTH, STAGGERED OR STOPPED?

Educational transitions among the youth

Understanding educational transitions is vital to addressing basic skills shortages. Efforts to address these shortages have been hampered by a lack of high-quality longitudinal data. To gather this information, a new study provides the first in-depth look at how young people move through the education system and advises on how to succeed academically despite disadvantage. *Kathryn Isdale, Vijay Reddy, Lolita Winnaar* and *Tia Linda Zuze* report on the outcomes.

In South Africa, basic education is compulsory and all learners follow the same curriculum up to the end of grade 9. The end of grade 9 is a transition point in the education and training system. Post-grade 9, students can choose to remain in the schooling system (making different subject choices) for a secondary education, transition to a technical vocational education institution, transition to work or participate in neither education nor training.

The next major transition point is at the end of grade 12, where students who sat for the major exit matriculation examination can, depending on the quality of their pass, enter different post-school education and training institutions.

This segment of the LMIP's multi-cohort panel study focuses on pathways and transitions of a group of students who we followed for five years from grade 9. Such research provides valuable information and intelligence to skills planners on the different pathways that students follow post-grade 9, and hence the pool of skills at different levels that subsequently enter the labour market.

Smooth, staggered or stopped?

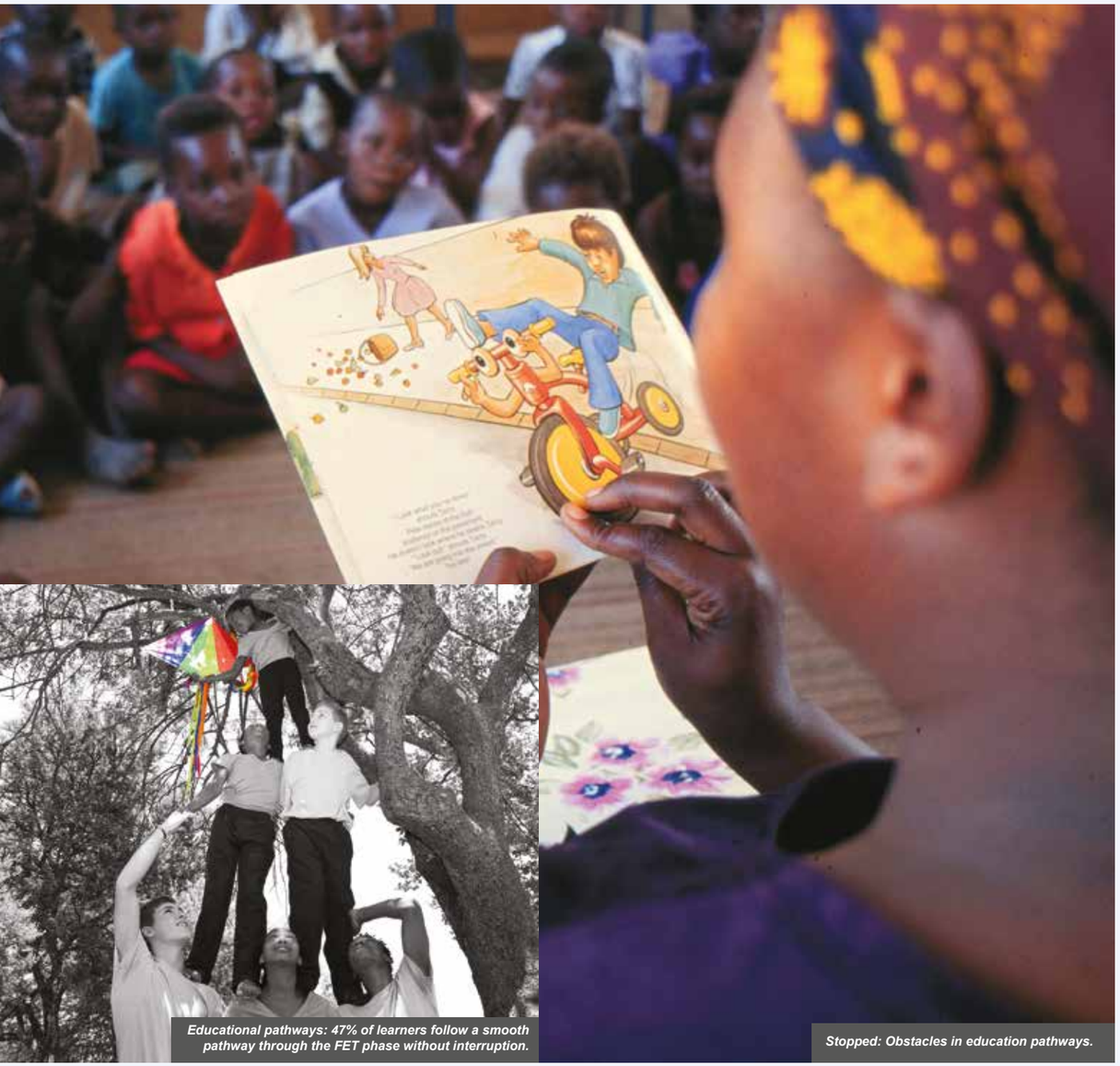
Year-on-year, incremental progress is the gold standard of education. While progression and promotion policies are in place to address any possible anticipated interruption in overall learner journeys, smooth transition through each stage of an individual's schooling career is a core aim of education programmes the world over.

New analysis from a longitudinal study of South African youth suggests that just under half of all learners are following this smooth type of pathway through the further education and training (FET) phase of schooling, with the rest following three other distinct progression routes.

Understanding educational transitions is vital to addressing basic skills shortages and improving the life chances of all South African learners. Efforts here have, however, been hampered by a lack of high-quality longitudinal data. In response to the lack of appropriate data to examine these issues and to obtain a better understanding of the variation in pathways taken by our youth, the HSRC administered the South African Youth Panel Study (SAYPS).

This report provides the first in-depth look at what young people are doing, how they move through the education system, and how background and school-level characteristics influence those pathways.

Understanding educational transitions is vital to addressing basic skills shortages



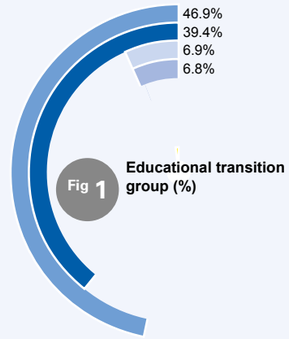
Educational pathways: 47% of learners follow a smooth pathway through the FET phase without interruption.

Stopped: Obstacles in education pathways.

Mapping different educational pathways

To explore the educational transitions of young people, SAYPS followed grade 9 learners who participated in an international assessment of mathematics and science (Trends in International Mathematics and Science, (TIMSS)) in 2011 over four consecutive years.

The research suggests that South African learners follow one of four educational pathways: 47% follow a smooth pathway, where they progress through the FET phase of secondary school without interruption; a further 40% follow a staggered pathway, where their advancement is marked by at least one episode of grade repetition; despite the Department for Basic Education's progression policy, 7% of learners remain stuck in grade 9 or 10 for three or more years; and a final 7% leave school shortly after grade 9 and do not return.



Learners who want a high level of education for themselves see greater value in mathematics and science and enjoy school more and are more likely to have a smooth pathway through school.

Our results are broadly twofold:

The predictable story…

Educational transitions among learners show a somewhat predictable story of advantage, confirming much of what is already known with respect to school progression.

For example, achievement begets achievement; learners who follow a smooth transition tend to have higher scores in the TIMSS assessments measured at baseline, come from more highly educated households, and attend fee-paying and independent schools.

In addition, boys and those with previous episodes of grade repetition are more likely to experience interrupted pathways through school.

…vs. a new one

The report also tells a new, less formulaic story about educational progression highlighting that it is possible to beat the odds and succeed academically despite disadvantage.

Our analysis shows, for example, that while the importance of earlier academic achievement and school quality is clear, many learners from the least well-off schools are progressing through school without delay or interruption: 57% of the smooth transition group come from fee-paying and independent schools, meaning that 43% come from no-fee schools.

The findings also indicate that measures of achievement are not deterministic, with learners who perform poorly in assessments of both mathematics and science also being able to realise smooth progression pathways through school.

Having high educational expectations and positive attitudes about school are related to smooth transitions: learners who want a high level of education for themselves see greater value in mathematics and science and enjoy school more and are more likely to have a smooth pathway through school.

Educational expectations matter

With studies such as TIMSS suggesting that only a quarter of South Africa's grade 9 learners are reaching the lowest international benchmark comparisons and just 1% the advanced levels, and youth unemployment estimated to be a staggering 66%, understanding the educational journeys of all learners is integral to building a school system that truly serves all its learners and developing one that can compete on a global stage.

Our study looks beyond the predictable pattern of 'achievement begetting achievement' story and demonstrates that educational expectations matter and that the school attended, needs not. Together the results paint a complex picture of educational transitions where advantage operates but so too does the notion of 'beating the odds' where the flipside of advantage need not so formulaically be poor outcomes.

The study provides an additional lens to policies focused on expanding post-school educational opportunities by showing what progress through school looks like for different types of learners.

While our predictable story supports commitments to increasing educational opportunities and ensuring that learners thrive at school, lending support to the National Development Plan's (NDP) focus on early interventions to address opportunity gaps, it also demonstrates the systemic challenges faced by boys at school that require further attention.

The report highlights patterns of fluidity across the achievement spectrum and transition pathways that require further investigation. In particular, shifts in and out of the schooling system might be more frequent than previously thought and so it is important that the country's schooling and post-schooling system is well integrated to allow for these movements. Equally important is clarifying what options are available for learners, in terms of technical vocational education and training and community colleges, the terrain of which is currently very complicated. Finally, evidence of persistent grade repetition suggests a need to understand how the current progression policy is applied practically across different schools.

Author: Kathryn Isdale, Director, QER Consulting and honorary research fellow, Education and Skills Development (ESD) programme, HSRC; Dr Vijay Reddy, executive director, ESD; Lolita Winnaar, research specialist, ESD; Dr Tia Linda Zuze, research specialist, ESD.

This article is based on Isdale, K., Reddy, V., Winnaar, L., Zuze, L. (2016) Smooth, Staggered or Stopped: Educational Transitions in the South African Panel Study, available on http://www.lmip.org.za.

[1] *Including discouraged job seekers.*

Tracing graduates into the labour market

From both a skills planning and a broader societal perspective, all countries need to understand whether graduates from universities, technical vocational education and training colleges or workplace training programmes find employment and, if they do, whether that work is related to what they studied. Gathering information on this, however, is quite a challenge. *Mike Rogan* explains.

Collecting data on graduate outcomes and incorporating it into a comprehensive Labour Market Information System (LMIS) is surprisingly difficult.

Post-school education and training is expensive both for individuals and for the fiscus, so getting the expected returns on this investment is crucial. In South Africa, there is an extra sense of urgency in relation to the post-school education and training sector, since it is one of the most important mechanisms for addressing the high levels of inequality and the skewed nature of labour market opportunities that is a legacy of the colonial and apartheid past.

How do we measure graduate outcomes?

Collecting data on graduate outcomes and incorporating it into a comprehensive Labour Market Information System (LMIS) is surprisingly difficult. The vast majority of our data on the labour market in South Africa comes from Statistics South Africa's official Labour Force Surveys (collected bi-annually between 2000 and 2007 and on a quarterly basis since 2008).

While these surveys provide a wealth of information on the labour force as a whole, it is difficult to derive detailed information on labour force participants who have obtained some type of post-school education. For example, only 1.4% of the sample enumerated in the most recently released Quarterly Labour Force Survey (QLFS 2015-Q4) obtained a bachelor's level degree. This number is far too small to use in an analysis of how study fields, academic achievements and institution types are linked with different employment outcomes.

If the QLFS is limited in measuring graduate outcomes, what options remain? Unfortunately, there are very few sources of data that contain detailed information on schooling, post-schooling education and training, and labour market outcomes. As a result, many countries regularly undertake graduate tracer or destination studies to get a glimpse of how post-school education is rewarded in the labour market, and whether the skills that are obtained are the same as those in demand by businesses and employers. Graduate tracer studies are relatively straightforward in their design. Researchers simply obtain a list of graduates and their contact details from the relevant educational institutions, and 'trace' their progress since graduation/completion.

The ideal window is often four to five years, so that graduates will have had enough time to develop their careers and find employment related to their studies. By analysing data from these tracer or destination studies, researchers can identify which types of graduates and fields of study are linked with a higher rate of successful employment.

So why are there so few graduate tracer studies?

If graduate tracer studies are effective in providing signals indicating the relevance of education and training in the labour market, why are there so few of them? This seems to be a particularly appropriate question in South Africa where there have been only a handful of large longitudinal tracer studies over time. The reason is that tracer studies are data intensive, time consuming, very expensive, and require access to personal data protected by legislation. As a result, there has been no national graduate tracer study of either the South African Technical Vocational Education and Training (TVET) or higher education sectors to date that provides evidence of longitudinal trends.

Recently, however, there has been methodological progress in the design of university graduate tracer studies. Since the late 1990s, the HSRC has conducted several large tracer studies that enumerated graduates from a number of public universities across South Africa. More recently, the Cape Higher Education Consortium (CHEC), working with LMIP, has conducted tracer studies of graduates from Western Cape (CHEC, 2013) and Eastern Cape universities, respectively.

By analysing data from tracer or destination studies, researchers can identify which types of graduates and fields of study are linked with a higher rate of successful employment.

While these studies are not representative of graduates from all South African universities, each has demonstrated that it is possible to trace graduates from different institutions and to analyse the relationships between, inter alia, study choices and labour market outcomes. One encouraging finding is that, despite differences in questionnaire design, sampling approaches and time periods, there are a number of consistent results across these studies. This suggests that, while these studies are difficult and expensive to conduct, they can provide broadly consistent signals about which types of graduates are more likely to find employment.

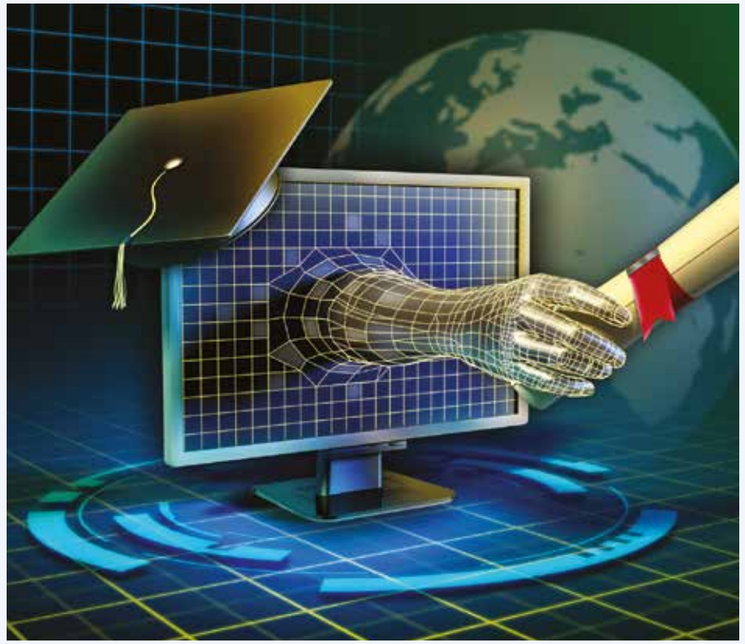
What is the way forward?

Perhaps the most important question that now remains is whether a large national tracer study of university graduates (or TVET completers) would contribute meaningfully to an LMIS in South Africa.

One problem is that it is not clear whether the quality of the labour market signals tracer studies provide are worth the cost. The single largest limitation of these studies is that they suffer from what researchers call selection bias. This simply means that the graduates who agree to be surveyed and for whom researchers are able to obtain relevant contact details may be systematically different from graduates who either refuse to participate or are untraceable.

These systematic differences may, in turn, be correlated with the actual employment outcomes of interest (whether graduates are employed and working in jobs which are related to what they studied). Obviously it is important to minimise the risk of selection bias before expending a high level of resources on sampling and tracing graduates.

Several researchers working within the LMIP have considered this issue and provide important methodological lessons to improve the reliability of tracer studies. Dr Nicola Branson from UCT analysed the CHEC Western Cape tracer study, and identified five lessons to help improve the design and planning of larger tracer studies.



Her recommendations include: improving graduate databases, collecting baseline information from recent graduates, combining tracer and administrative data, improving survey protocols, and expanding the labour market modules of graduate questionnaires. Professor Joy Papier from UWC is working with the LMIP to improve the methodology of tracer studies of TVET graduates. Early experiences in the field indicate that there is potential for institutionalising tracer studies to identify how well TVET graduates are prepared for the South African labour market.

Why tracer studies matter

Despite their costs and limitations, tracer studies form an important component of national LMISs, precisely because they provide information on labour market indicators that cannot be measured easily using traditional sources of data. LMIP researchers are working in a number of different ways and across several sectors (including adult education and workplace training) in order to improve the methodological base for scaling up tracer studies to provide crucial labour market intelligence as at the national level. There is still much work to be done, but the tracer study research conducted through the LMIP represents real progress in standardising research methodologies and identifying the ways in which these studies could be institutionalised in South Africa in order to improve our understanding of the post-school education and training sector.

Author: Michael Rogan, senior researcher, Neil Aggett Labour Studies Unit (NALSU), Institute of Social and Economic Research, Rhodes University.

This article draws on a set of LMIP research projects on Pathway Studies on http://www.lmip.org.za.

MORE THAN WAGES:

The gap between expectations and experience

In the context of constrained economic growth and a general scarcity of jobs, South Africans consider job security and non-financial characteristics just as important in a job as the economic benefits, writes *Bongiwe Mncwango.*

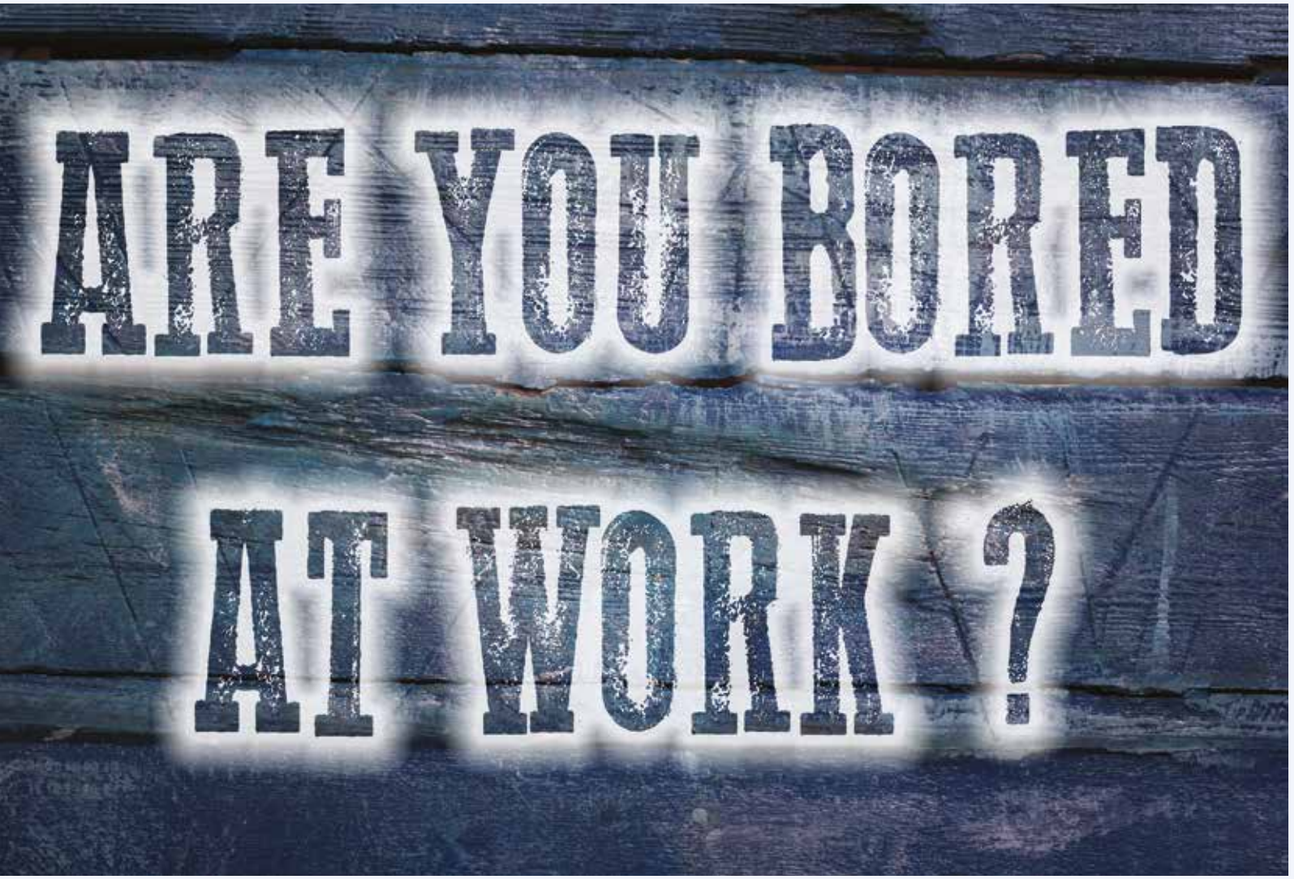
Reflecting on how the public arrive at decisions about employment, work-seeking, or participation in education and training could offer critical information for effective skills planning. Currently, our understanding of how the South African public defines work, or what they expect from engaging in paid work activities, is very limited. It cannot be gleaned from an examination of existing labour market macro datasets on employment and unemployment. Thus a more comprehensive understanding of the public's lived experiences and attitudes as labour market actors would be very useful for policy development, and could enhance the effectiveness and uptake of programmes and interventions aimed at improving labour market participation and skills development.

Prioritising the connection between labour market behaviours and work attitudes, the study examined public attitudes to work in order to gain a deeper understanding of South African work values, preferences and subjective work experiences, and labour market behaviour patterns. Research was driven by two primary assumptions:

- Attitudes are significant predictors of individuals' behaviours and therefore provide an important window into factors that influence labour market decisions, behaviour and preferences.
- In-depth attitudinal and perceptual data about labour market participants can offer more nuanced perspectives on labour market challenges. These issues are particularly pertinent in a labour market characterised by unequal distribution of opportunities and increasingly wide variances in the quality of work, along race and socioeconomic dimensions.

> Our understanding of how the South African public defines work, is very limited

A module with detailed questions about social attitudes towards the labour market was included in the South African Social Attitudes Survey (SASAS) of 2013. Data were collected from a representative sample of 2 884 South Africans aged 16 years and older, of whom 30% were employed, while almost 3% indicated that they were unemployed



Security of tenure is what makes a job 'good' compared to other job conditions and financial benefits.

and the remaining third (33%) reported as being economically inactive.

Perceptions of job quality are determined by multiple factors

In seeking to identify what the respondents perceived as important in a job, the study evaluated five aspects on a four-point scale, ranging from very important to not important.

We asked all respondents irrespective of employment status to indicate to what extent different aspects of a job were important to them (Figure 1).

All aspects of a job were highly rated, showing that almost all respondents acknowledged that different elements contribute variously to the overall experience of a job. Of these, job security was rated as 'very important' by almost seven out of 10 work seekers, more than any other characteristic, with one-third citing this as 'important'. The public also identified the prospect of advancement as the second 'very important' factor in a job. Other characteristics, related to whether the job is interesting, useful to society, or provides high income, although rated highly, were not perceived as the top priority. Therefore, although the public sees a need for occupational growth, intrinsically satisfying jobs, good income, and security of tenure are what make a job 'good' compared to other job conditions and financial benefits.

We then examined patterns within the group that rated specific job attributes as 'very important'. We found discernible age, race and education attainment differences in what work seekers perceive as valuable attributes of a job.

The main age effect was evident among those in their sixties who, upon reaching retirement age, appeared to express lower overall attachment to job security, earnings and promotional opportunities than younger cohorts. Black Africans placed greater emphasis than other population groups on high earnings (56%), job content (52%) and meaningfulness of work (54%).

There was a strong educational effect. Those with higher levels of education, particularly a matric and tertiary education, tended to consider issues such as job security, promotion and interesting work of greater concern than did those with limited or no formal schooling. However, in the value attached to earnings, those with a tertiary education placed less emphasis on a high income than did those with a matric or lower educational attainment.

Gaps between what workers want in a job and what they have

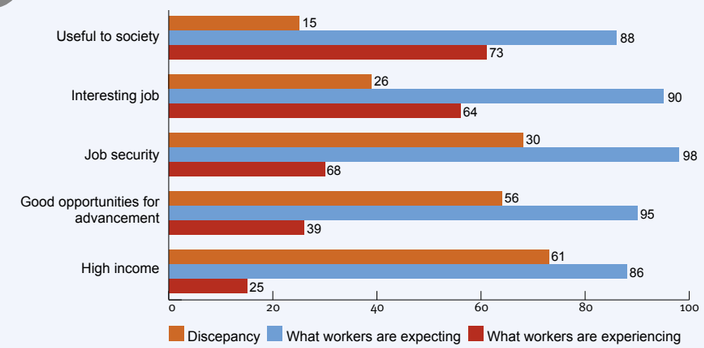
Among the employed, we compared workers' aspirations with their perceptions of their current employment and working conditions. Figure 2 points to discrepancies between what workers perceived as important in jobs, and what they experienced.

While on average around two-thirds of South African workers believed that their jobs were useful to society, were secure, and have interesting content, there was considerable dissatisfaction around the economic rewards for their labour and prospects for upward social mobility. Only one-fifth of workers considered their incomes to be high, while two-fifths (39%) indicated that they have good promotional opportunities. The disparity between work values (what workers perceive to be important in a job) and workplace reality (subjective evaluation of what is happening in their current jobs) is, therefore, much wider in relation to attaining a high income (61%) and good prospects for job promotion (56%). This suggests that workers' intrinsic expectations, in contrast to economic expectations (earnings and chances for career progression), are being met in the workplace.

Fig 1 **Perceived important characteristics in a job (%)**

Source: HSRC 2013

Fig 2 **Gaps between what workers want in a job and what they have (%)**



Source: HSRC 2013

In conclusion

Representing a departure from the traditional assumption of 'working for a wage', the study shows that individual expectations from work are far more complex, in accordance with varied needs and preferences. Counter intuitively, the study found that South Africans acknowledge the importance of intangible elements alongside decent earnings in their jobs, suggesting that people desire decent jobs with job security as a top priority. Such an understanding is critical for policy makers, employers, as well as workers' rights organisations to contribute to the adaptation of targeted interventions seeking to improve the overall experience of work.

The gap identified between worker expectations and labour market realities, particularly in terms of earnings and opportunities for career progression, present a possible starting point for interventions aiming to improve workplace relations. More longitudinal and in-depth studies are required to identify and continuously observe workers' expectations in the light of current workplace realities.

Author: Bongiwe Mncwango, senior researcher, Education and Skills Development (ESD) research programme, HSRC

The full report, Mncwango B. (2016) *Public Attitudes to work*. An LMIP publication. Human Sciences Research Council, is available on http://www.lmip.org.za.

Perceptions of qualification mismatches:

A BALANCING ACT

Qualification mismatches, defined as discrepancies between the qualifications held by workers and those required by their jobs, have been a growing concern amongst policy-makers, says *Bongiwe Mncwango*.

Ensuring that workers' skills and qualifications correspond with job requirements is necessary to ensure that available skills are appropriately utilised in the workplace. However, when workers' educational attainment is either higher (over-qualification) or lower (under-qualification) than the minimum required to do a job, a qualification mismatch occurs. Both types of discrepancy represent a form of underemployment which reflects a misallocation of labour resources. Qualification mismatches point to inefficiencies in allocating workers to jobs where they would adequately apply their skills and competencies.

It is often argued that qualification incompatibilities result from an educational system's failure to provide work seekers with skills relevant to labour market demands and dissonances are sometimes attributed to the labour market's failure to create suitable jobs for all workers. Moreover, in a context of high unemployment, first-time labour market entrants have the most difficulty in finding jobs that match their qualifications. This increases the likelihood that workers accept initial employment positions that do not fully utilise their skills.

Therefore, while these individuals have found positions in the labour market, job-qualification mismatches are a cause for concern for skills planners. A number of adverse labour market outcomes — underutilisation of skills, high turnover and failure to meet new market demands — may result. Such gaps can block goals for attaining inclusive economic growth.

A neglected dimension to enhance understanding of qualification mismatches in the economy is the extent to which employed South Africans perceive whether their educational attainment corresponds with the skills required to successfully execute job responsibilities.

Job-qualification mismatches are a cause for concern for skills planners.

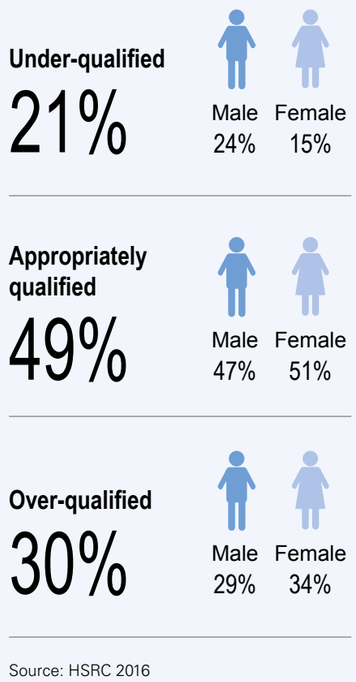
Data were collected from a nationally representative household sample of 2 884 South Africans through the HSRC's 2013 South African Social Attitudes Survey (SASAS). We used responses from a third, 30% (850), of over-16-year-olds who indicated that they were employed. We relied on self-reported data to compute over-qualification or under-qualification by comparing each worker's highest level of educational attainment with minimal prerequisite standards identified by workers as necessary for performance of the current job.

The incidence of perceived mismatches among South African workers

More than half of workers (51%) were found to have experienced a job-qualification mismatch. Over-qualification is more prevalent than under-qualification, with almost a third reporting they are overqualified, and a fifth identifying as underqualified. Based on South African evidence, we know that better educated work seekers are three times more likely to find employment compared with less educated persons. Higher shares reporting over-qualificativon could thus be reflective of rising educational levels among South Africans. This signals two possible trends: first, that workers have good qualifications but are misplaced in the labour market due to a lack of requisite skills; second, it may be that educational levels of workers are increasing but the content of a job is not advancing.

Figure 1 highlights a gender dimension: women were more likely to report over-qualification than their male counterparts. The trend that women were more open to taking up employment that did not make the most of their higher qualifications suggests that women are more likely to accept jobs for which they are overqualified, in order to improve work-life balance.

Fig 1 The incidence of perceived qualification mismatches

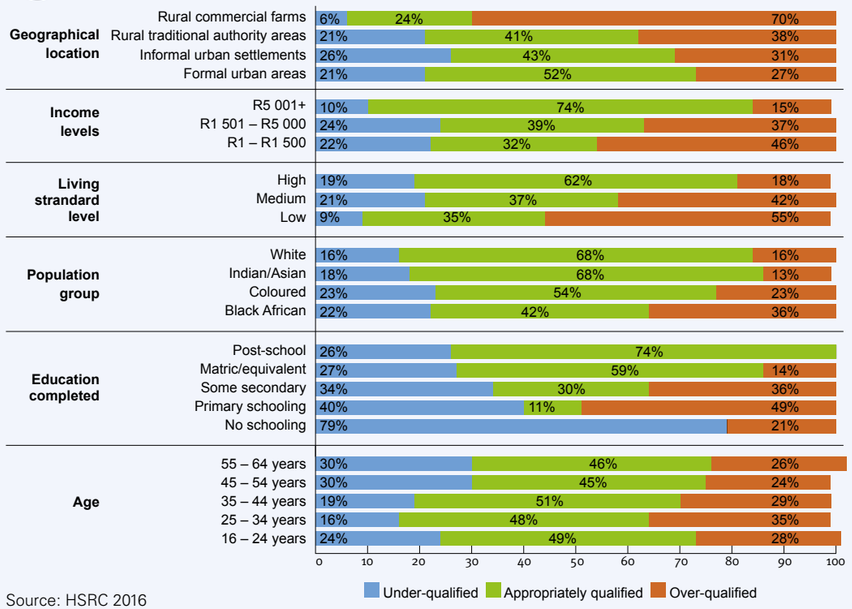


Source: HSRC 2016

Incidence of perceptions of over-/under-qualification (percentage) by socioeconomic characteristics

Figure 2 considers how qualification mismatches affect individuals at different stages of their working lives.

Fig 2 Incidence of perceptions of over-/under-qualification by socioeconomic characteristics (%)



Source: HSRC 2016

Women were more open to taking up employment which does not optimise their higher educational attainment.

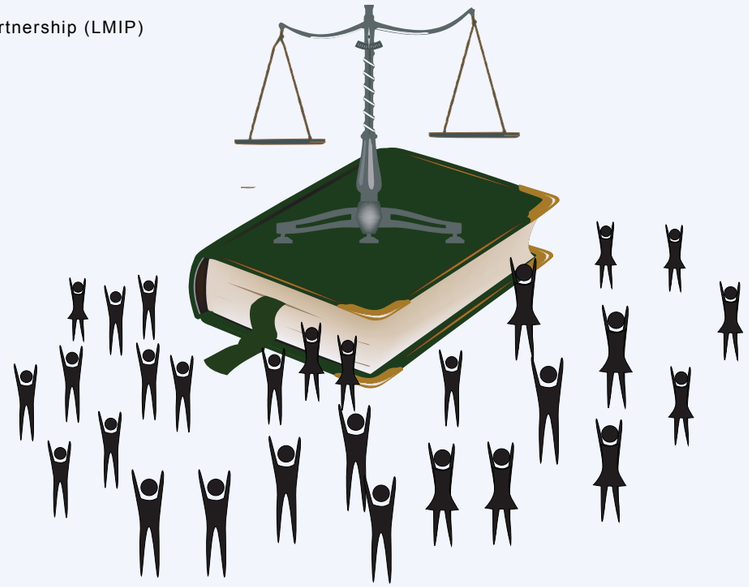
Older workers aged 45 and above were more likely to state that they were under-qualified for their jobs, compared with younger workers. This might signal a failure to keep pace with changing qualification requirements through professional development programmes or further education and training. Workers with no formal education were also more likely to report under-qualification. Such individuals may possess the necessary job skills and competencies but lack associated qualifications. The incidence of under-qualification gradually decreased as levels of educational attainment increased.

Under-qualification continues to reflect racialised labour market patterns. Larger proportions of black and coloured workers (22% and 23% respectively) reported they were underqualified, in comparison with Indian/Asian (18%) and white (16%) workers.

In contrast, younger workers between 16 and 44 years were more likely to report being over-qualified. Twice as many black as white respondents identified as over-qualified, below the national average. Some of these workers could be vulnerable groups in the labour market, such as young first-time entrants. If these young workers accept positions for which they are over-qualified to compensate for their lack of experience as a stepping stone to avoid lengthy queuing for better jobs, the question becomes: what are their chances of moving to jobs that match their qualifications? Or will such workers find themselves 'trapped' in current jobs for extended periods of time?

In terms of spatial determinants, residents of formal urban areas were more likely to be well matched than were workers in other geographical areas. However, workers who are residents of rural commercial farms were likely to be over-qualified, more than twice the national average.

Perhaps most significantly, the findings confirm the positive impact of education and training on labour market outcomes. Indeed, being better educated increases the odds of workers being well matched. Apart from workers with no formal education, the incidence of over-qualification increases with the level of education completed.



Being better-educated increases the odds of workers being well matched.

Unanswered questions

Recognising that this study was exploratory, there are still a number of questions that remain unanswered. Which occupational groups are more likely to be mismatched? Are these states temporary or permanent? How long does it take mismatched workers to transit into a better or well matched job? What are the causes of these mismatches in the South African labour market?

For now, we conclude that whether under-qualified or over-qualified, being mismatched in the labour market can have enduring adverse effects for the individual, the labour market and the economy. It is therefore critical to achieve a match between workers' skills and job requirements, to avoid human capital wastage and to ensure that workers' skills are appropriately utilised. The study findings include compelling evidence for the urgent need for continued investment in lifelong learning and on-job training programmes, to ensure that skills are kept up to date with what is required in the workplace

Authors: Bongiwe Mncwango, chief researcher in the Education and Skills Development (ESD) research programme, HSRC.

This article is based on Mncwango B. (2016) *Public Attitudes to work*. An LMIP Publication. Human Sciences Research Council. Available on www.lmip.org.za

It is critical to achieve a match between the skills attained by workers and job requirements, to avoid human capital wastage and skill obsolete.

INEQUALITY IN ARTISANAL EMPLOYMENT: a PERSISTENT challenge

Improving the access of previously marginalised groups to skilled (intermediate and high-level) occupations is vital to grow the South African economy and to make strides towards a labour market characterised by less inequality. However, deepening gender, race and language inequalities persist as challenges in artisanal employment in South Africa, explain *Angelique Wildschut* and *Tamlynne Meyer*.

What the numbers say

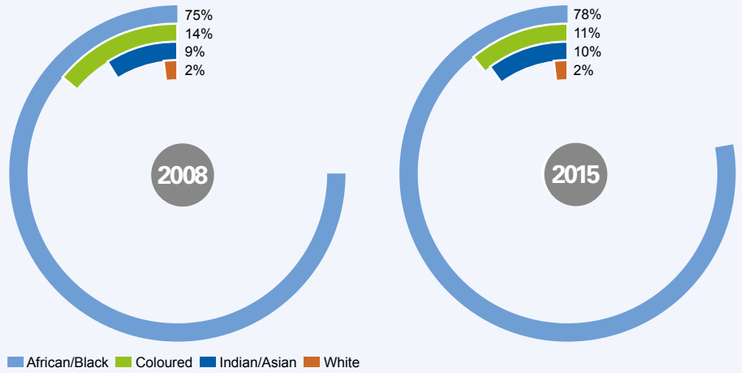
Levels of inequality have been declining in terms of race; however Africans continue to be slightly under-represented in artisanal employment (Figure 1). The 2015 mid-year estimates put Africans at 80.5% of the total population, while constituting 78% of artisanal employment.

Examining trends in the representation of men and women reveals that gender inequality in artisanal employment not only persists but has strengthened over the last few years (Figure 2).

However, the quantitative picture does not reveal the full story of inequalities in artisanal employment, nor why they persist and may even intensify.

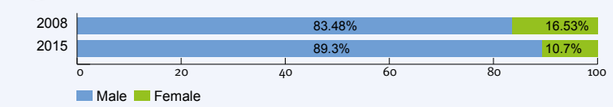
Gender inequality in artisanal employment not only persists but has strengthened over the last few years.

Fig 1 **Employment in craft and related trades workers occupational group, disaggregated by race, 2008 and 2015 (%)**



Source: Labour Force Survey (2008 and 2015)

Fig 2 **Employment in craft and related trades workers occupational group, disaggregated by gender, 2008 and 2015 (%)**



Source: Labour Force Survey (2008 and 2015)

Miners going underground, planning the work.
Credit: Antonio Muchave@Sowetan/Times Media

This research reveals a compelling storyline of how skilled occupations continue to monopolise a segment of the labour market for their 'members'.

The importance of studying occupations and workplaces

As inequalities in workplaces hold implications for skills planning, Wildschut's research argues that we can improve planning for future skills needs by developing a better understanding of the sociological phenomena at play within and between occupational groups in workplaces.

This research reveals a compelling storyline of how skilled occupations continue to monopolise a segment of the labour market for their 'members'. It also shows how these practices intersect with racial, gender, generational and language exclusivity and dominance.

Telling testimony of gender stereotyping

Delving more deeply into their qualitative research, findings exposed a predominantly masculine occupational culture. '[I]f we select the wrong people what you will have in the system will always be the wrong people…and we [are] struggling now with the women,' said one respondent, alluding to the perceived inability of women to cope with the demands of artisanal work. Another respondent reflected his perception of women's inability to do certain tasks associated with artisanal work due to their physical size, '[t]he only problem I find with women is when you come to heavy equipment, like switch gear and that you know… where a lady was doing what we call 'phasing' and then there was a problem but she was like this [referring to small], now this switch gear that she needs to move is about that [referring to big] size…'

Existing research on how occupations become associated with a particular gender shows that an important basis is a biological discourse that concentrates on women's physical capacities (size, shape, strength) to assert that certain work tasks are more appropriately performed by males. While the extent varied, such a gendered discourse was identifiable across all cases[1] that made up the study.

'Because of the BEE that's coming a lot of black apprentices are being trained at the moment ... what I do see is the guys that are qualifying these days a lot of them I'd say they [are] not as good as what I think they should be.'

'Pride of the work I think that's very important and that's what I'm missing with a lot of our youngsters today, they do a job because they get paid for it – you know I always say when an artisan phones me, when I go underground he says, "[M]eneer! Come and look at this installation I've done", I know he is proud [of] that you know.'

Language was found to be critical in supporting this discourse, because

Biological discourse concentrates on women's physical capacities (size, shape, strength) to assert that certain work tasks are more appropriately performed by males.

Intersections of race, age and language exclusivity

Although the quantitative data reflect a decline in racial inequality measured in terms of formal representation and access to occupations, our qualitative data show how the construction of artisanal work and occupations contributes to persistent racial, age and language exclusivity and dominance. These inequalities overlap and are reproduced in the occupational culture in complex ways.

When reflecting on the attributes viewed as critical for an artisan, respondents tend to portray white and older artisans as more committed, having more pride in their workmanship and delivering better quality work.

[1] *Three cases made up the empirical bases for the study: mechatronics trades workers in the automotive sector, electricians in the mining sector and millwrights in the metals sector.*

it served as another way in which to portray younger apprentices (invariably black) as less competent, not interested in learning, and lazy. One respondent reflects on the difficulties in communication: '[W]e have a country full of diversity so sometimes things you say in Afrikaans…this guy maybe he is Xhosa he doesn't understand Afrikaans…So communication is coming in between…'

At the same time, the very real implications for full participation and access to artisanal training are highlighted. Here a respondent shows how Afrikaans continues to be a dominant language and often the medium of instruction, which can make learning difficult:

'Yeah but on the workshop hmm it's when our boss, he is used to talk Afrikaans, forgetting that some of the others they don't understand, they go out not hearing what he's said, going home he's lazy or he is afraid to ask "[H]ey man can't we use this language".'

The evidence displays how social differences continue to emerge as critical bases upon which artisanal work and occupations are constructed. Most importantly these views highlight how the intersection of different bases of inequality can intensify the degree of disadvantage in an occupation. Without overtly seeming to be discriminatory, significant barriers in the workplace can impact the career prospects of young black (female) trainees.

Occupational culture and opportunity

While the quantitative analysis illustrates shifts that are positive, from a transformational perspective, our research illuminates how historically unequal features of artisanal work still persist. Our findings confirm the importance of skills planners understanding occupational and work cultures, and how opportunities for women, young people and Black people to participate in skilled occupations in South Africa can remain constrained.

Authors: Dr Angelique Wildschut, senior research specialist, Education and Skills Development (ESD)_ research programme HSRC; Dr Tamlynne Meyer, researcher, ESD.

The full report, Wildschut, A & Meyer, T, *The Shifting Boundaries of Artisanal Work and Occupations* is available on www.lmip.org.za

Social differences continue to emerge as critical bases upon which artisanal work and occupations are constructed.

Artisans and technicians in South Africa: WHAT THE FUTURE HOLDS

Artisanal work is becoming more complex.
Credit: Guy Stubbs

There are widespread claims of a shortage of artisans in South Africa. While there is general agreement that artisan development is crucial, there is little consensus about the scale and nature of the demand, or about the nature and quality of artisanal training and work preparation. *Angelique Wildschut* and *Gerard Ralphs* report.

A number of pressing questions emerge: What knowledge and skill does a 21st century artisan require? What would a 'good artisan training system' look like? What would artisanal work of the future look like?

To assist policy-makers in their attempts to plan for future skills, this study looks at work itself – investigating its organisation and the diagnostics and problem-solving skills required in the work of artisans and technicians. It is a demand-focused study that has the changing nature of work as its central theme and seeks to contribute to labour market intelligence by putting forward an evidence-based argument for how to prepare artisans and technicians to be work ready.

We studied the sites in which artisans and technicians work in four sectors of the economy – boat builder and repairer in the boat-building sector; mechatronics technician in the engineering sector; camera assistant in the film-production sector; and confectionery baker in the tourism and hospitality sector.

Research covered four key themes of interest: company futures, workplace culture futures, work futures and qualifications futures.

Company futures

According to business leaders we interacted with, the state of the global economic climate, regional and local political stability, and market volatility were the three key drivers of change in their companies. These dynamic structural factors, all beyond the control of companies, were viewed as potentially having the highest impact on future growth.

Business leaders were, however, positive about current growth and growth forecasts, linking these projections to business strategies such as local and international diversification of products in both niche and mass markets. For example, companies in the baking sector which were oriented towards mass markets based their positive predictions on the constant growth experienced to date, while those oriented more towards niche markets used the steadily growing demand for artisanal breads from a greater variety of outlets as the basis for their prediction.

In the domain of employment, business leaders were clear that practices such as subcontracting, outsourcing, decentralisation, casualisation of work, temporary contracts and seasonal work fluctuation will affect future employment flows and movements of staff. The anticipated impact of these factors differed by sector and size of the firm. Small sites displayed a tendency towards predicting seasonal work fluctuations and temporary contracts, and larger sites tended towards predicting outsourcing.

Workplace culture futures

The complexity of work can be captured by two opposing concepts: certainty and risk (Figure 1). When the end result is continually at risk during the process of making, producing, or maintaining, we talk about work of risk. All workplaces try to reduce risk and aim for work certainty through strict adherence to standard operating procedures (SOPs), for example.

Across all the sectors studied a 'low-risk' workplace culture was predicted for artisans and technicians of the future. This prediction was attributed to the increasing routinisation and standardisation of work that is arising from mechanisation, automation and digitalisation.

In mechatronics, for example, it is essential that work is performed to standard at all times to meet quality assurance, avoid costly product recalls, or mitigate the risk of damage to equipment. The environments in which artisans and technicians operate must be fool proof.

The future of work

A 'low-risk' workplace culture for artisans and technicians relates to the anticipated nature of their work in the

Business leaders were, however, positive about current growth and growth forecasts.

A 'low-risk' workplace culture was predicted for artisans and technicians of the future… attributed to mechanisation, automation and digitalisation.

Table 1: Work as a continuum of 'certainty' and 'risk' (Pye, 1968)

Work of certainty	Work of risk
Routine work	Mostly novel or unique situations
Narrowly specified tasks	Experimentation
Predictable problem solving	Complex problem solving
Simple task subject matter	Complex task/subject matter
Technique-focused	Conceptually driven
Supervised work	Autonomous work
Rule-following	Independent judgement
Simple interpersonal relations/teams	Complex inter-personal relations/teams

Source: HSRC, 2016

future: the greater the need for certainty of end-result, the greater the emphasis on standardised work performance through common work procedures; the greater the emphasis on innovation and design, the greater the need to work out new connections between parts, not by trial and error but through principled reasoning. Here, risk is inevitable as the answers are not known beforehand.

The research found two opposing work change trends: a shift towards predictable and standardised work, as well as a shift towards unpredictable risk work. Sectors were found either to move in one direction only, or to display both trends simultaneously. For example, in boat-building, lower-risk work is predicted based on increasing standards and procedures, but higher-risk work is also foreseen as a result of remote design work, new work methods and less supervision in a small business.

It should be noted that a sound technical vocabulary to talk about work, and the capacity for ongoing self-education and training to remain up-to-date, will contribute significantly to what counts as future 'technical competence'.

These trends hold implications for the future of training and development but current trends in the provision of qualifications for intermediate-level work should also be taken into account.

The future of qualifications

There is a general perception that there is very little training available for artisans and that 'down-skilling' will be the future trend.

The research found that in some cases formal qualifications are, and will be, an entry requirement for work, while a strong in-house and/or on-job training culture persists. On-job training and informal learning remain the dominant modes of education and training, with supplier-provided training on specific equipment or technology identified as a growing practice.

On-job training and informal learning remain the dominant modes of education and training

Each sector has a range of formal qualifications registered on NQF Levels 2 to 6. But there is little systematic evidence of delivery and take-up of these courses by the artisans, technicians, and companies (Table 1).

Table 1: Summary of artisanal education, training and development opportunities in four sectors

Sector	Trades	Entry qualification required	Relevant qualification(s) registered on NQF	On-the-job training	In-house courses	Short courses (external)	Supplier training
Hospitality	Baker		National Certificates (Various) NQF Levels 2 – 4	√		√	√
Boat-building	Boat builder		National Certificate NQF Levels 2 – 4	√	√		√
Film	Film maker		FET Certificate (NQF Level 4) National Certificate (NQF Level 5) National Diploma (NQF Level 6)	√		√	√
	Camera assistant			√		√	√
Engineering	'Automation-orientated' artisan	√	FET Certificate (NCV Level 4)* merSETA Mechatronics Learnerships NQF Level 4 (Trade Worker) and NQF Level 5 (Technician)	√	√ (medium and large firms)		√
	Automation technician	√	National (Professional) Diploma (NQF Level 6)	√		√ (programming)	√

Source: HSRC, 2016

Two reasons were offered: first, technical work performance has not been formalised or codified, with resultant lack of qualification development. Second, qualifications have been developed and registered on the NQF, but their impact on the development of artisans was perceived as negligible.

Four key trends for skills planning

Sector and company futures

Business unease about the connection between the global economic climate, regional and local political stability, and market volatility, linked to employment trends that anticipate a reduction in permanent or core staff and a drive towards cost-savings through subcontracting, outsourcing and casualisation, do not paint an overly optimistic picture of sectoral intent to invest in training and development.

Sound technical vocabulary to talk about work, and the capacity for ongoing self-education and training to remain up-to-date, will contribute significantly to what counts as future 'technical competence'.

Workplace culture futures

Shifts to a 'low-risk' workplace culture are predicted, and attributed to the increasing routinisation and standardisation of work arising from mechanisation, automation and digitalisation.

Sound technical vocabulary to talk about work, and the capacity for ongoing self-education and training to remain up-to-date, will contribute significantly to what counts as future 'technical competence'.

Project Literacy (2007).
Credit: Guy Stubbs@Africa Media Online

Work futures

Two opposing work change trends are found: a shift towards predictable standardised work and a shift towards predictable risk work. Because sectors and workplaces can only either move in one direction, or display both trends simultaneously, both up-skilling and down-skilling of the work of artisans and technicians can be found.

The implications for training are that different levels and types of apprenticeships will be required to serve the simultaneous coexistence of 'high- risk' and 'low-risk' work.

Qualifications futures

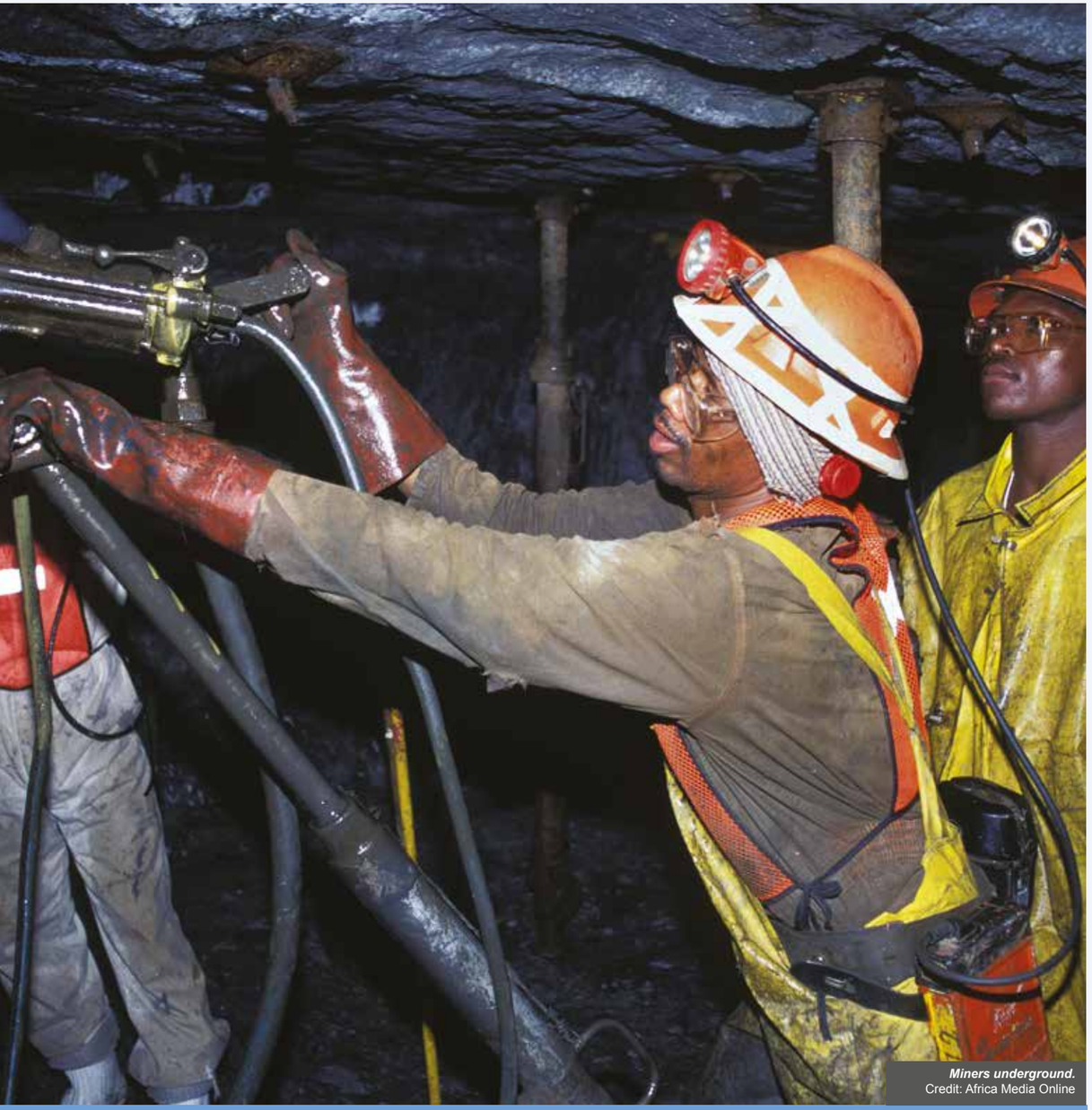
On-the-job training and informal learning remain the dominant modes of education and training, with supplier-provided training on specific equipment or technology identified as a growing practice.

Formally registered and recognised short courses will need a definite space and integrity of their own, and could provide the narrower skills base required in routinised and highly standardised work environments.

The research shows how an understanding of labour process variations and their impact on the nature of intermediate-level work provides a solid basis for supply-side planning, which does not take an 'imaginary curriculum' as a starting point but refers to actual work processes and their differences in large and small enterprises.

Authors: Dr Angelique Wildschut, senior research specialist and Gerard Ralphs, LMIP Communications, Education and Skills Development (ESD).

The full report, Gamble, J, *Work and Qualifications Futures for Artisans and Technicians* is available on www.lmip.org.za



Miners underground.
Credit: Africa Media Online

The South African mining sector has traditionally been a labour-intensive sector. However, to keep abreast with global competition, there has been an increase in the shift towards mechanisation and automation – a shift that holds implications for the skill and competency requirements in this sector, write *Angelique Wildschut* and *Tamlynne Meyer*.

STRUCTURAL INEQUALITY still characterise work in the mining sector

The shift towards mechanisation and automation in the mining sector is having an impact on the demand for different occupational groups. There are those who anticipate the increasing employment of high-skill workers, while some assert that intermediate-level skilled labour will be negatively affected by the introduction of technologies operated by semiskilled or unskilled workers (de-skilling).

The mining sector plays a significant role in the labour market, both in terms of employment and revenue generation, but it suffers from a history of inequality and instability that have a negative effect on investment and growth. This volatility was recently highlighted by strike action that not only spanned an extended period of time, but that was also violent in nature. In this regard it is clear that an important future research area will be to better understand the sociological drivers of labour market change, which is increasingly acknowledged as having critical implications for our country's economy.

'The mining sector suffers from a history of inequality and instability'

Office staff above ground – representing two occupational groups.

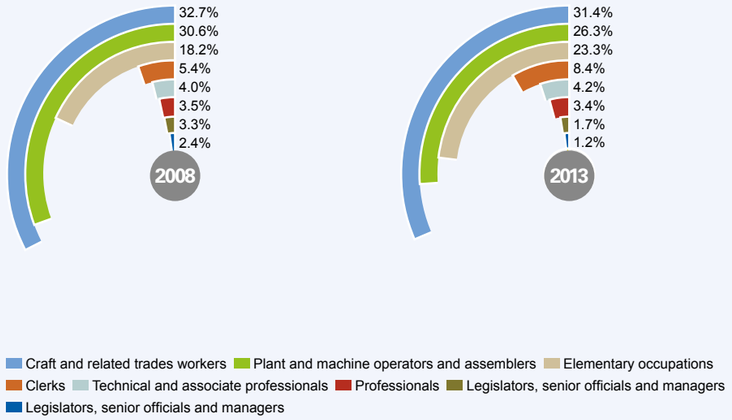
Data from a recent study by Wildschut et al on artisanal occupational milieus and identities indicated there was a growing trend to employ higher (professional) and lower-level (clerks and elementary) occupational categories. Table 1 shows that there was also an increase in intermediate-level occupations, but this growth was much slower in comparison. These trends would support both the high-skill and de-skilling hypotheses.

Table 1: Employment according to major occupations in the mining sector 2008 to 2013

Main occupations	Average annual growth rate 2008 – 2013 (%)
Legislators, senior officials and managers	(11.9)
Service workers and shop and market sales workers	(2.4)
Technical and associate professionals	0.5
Plant and machine operators and assemblers	1.0
Craft and related trades workers	3.4
Professionals	6.9
Elementary occupation	8.0
Clerks	11.8
Total	**3.6**

Source: HSRC 2014

Fig 1 **Employment according to major occupations in the mining sector (2014) (%)**



Source: HSRC 2014

The sector's history dictates unequal relations between the two occupation groups, based on gender and race.

Unequal relations between occupational groups

The trend towards increased employment of high-skill occupations, as opposed to intermediate-level skills, deserves some attention. This is not necessarily a problem, but the relation between high and mid-level occupations has historically been contentious in the sector. Not only does a large earnings gap exist, but the sector's history dictates unequal relations between the two occupation groups, based on gender and race. Qualitative data reveal that this relationship continues to be characterised by racial and gender inequalities that contribute to the maintenance of occupational hierarchies.

The study also illuminated structural inequalities between occupational groups in the sector.

Trends such as these have implications for labour relations in this sector. However, rather than reverting to the traditional characterisation of labour unrest relating mainly to wage disputes, it is time to elevate the discussion to other factors, namely how structural inequality perpetuated in the workplace can be better identified and addressed. Studies on occupational milieus and identities have the potential to do so in allowing for the examination of the underlying sociological drivers of labour market change – issues such culture, discourse and work identities associated with a particular occupation.

Under such an overarching theme, the study on artisanal occupational milieus and identities focused on studying the nature and shifts in boundaries between occupational groups. Thus, in facilitating an exploration of not only the extent but also the nature of change in the demand and supply of skills, the study also illuminated structural inequalities between occupational groups in the sector. Consequently, rather than just identifying the location and existence of structural inequalities in the labour market, the study allowed a better understanding of the underlying factors that continue to drive structural inequalities between occupations.

Authors: Dr Angelique Wildschut, senior researcher/post-doctoral fellow, Education and Skills Development (ESD) programme, HSRC; Tamlynne Meyer, junior researcher, ESD HSRC.

Connecting capabilities

TO REACH THE GLOBAL SCIENCE AND TECHNOLOGY FRONTIER

The Square Kilometre Array (SKA) telescope provides an example of how to effectively connect pockets of excellence in the national system of innovation, and align these with the skills and knowledge requirements of employers. This has helped the SKA to attain the critical mass and knowledge intensity required to compete at the global level, *Michael Gastrow, Glenda Kruss* and *Il-Haam Petersen* found as part of a large study on labour markets in South Africa.

The study forms part of the HSRC-led Labour Market Intelligence Partnership (LMIP) project that aims to set up labour market intelligence systems to enable the government and the business sector to better plan to meet skills development needs.

In the process of determining what was needed for better planning, it became clear that the inequality that characterised South Africa's economic and education systems posed a challenge for policy-makers seeking to reap the benefits of the knowledge economy. However, within this unequal system, there existed pockets of excellence where resources, networks and skills were concentrated.

One objective in such a structure is to effectively connect these pockets of excellence, and align them with the skills and knowledge requirements of employers to attain the critical mass and knowledge intensity to compete at the global level – thus leveraging existing knowledge assets to the overall benefit of the country. This can be achieved through well-developed interactive capabilities – the capacity for forming effective external linkages.

Creating networks to build knowledge and skills

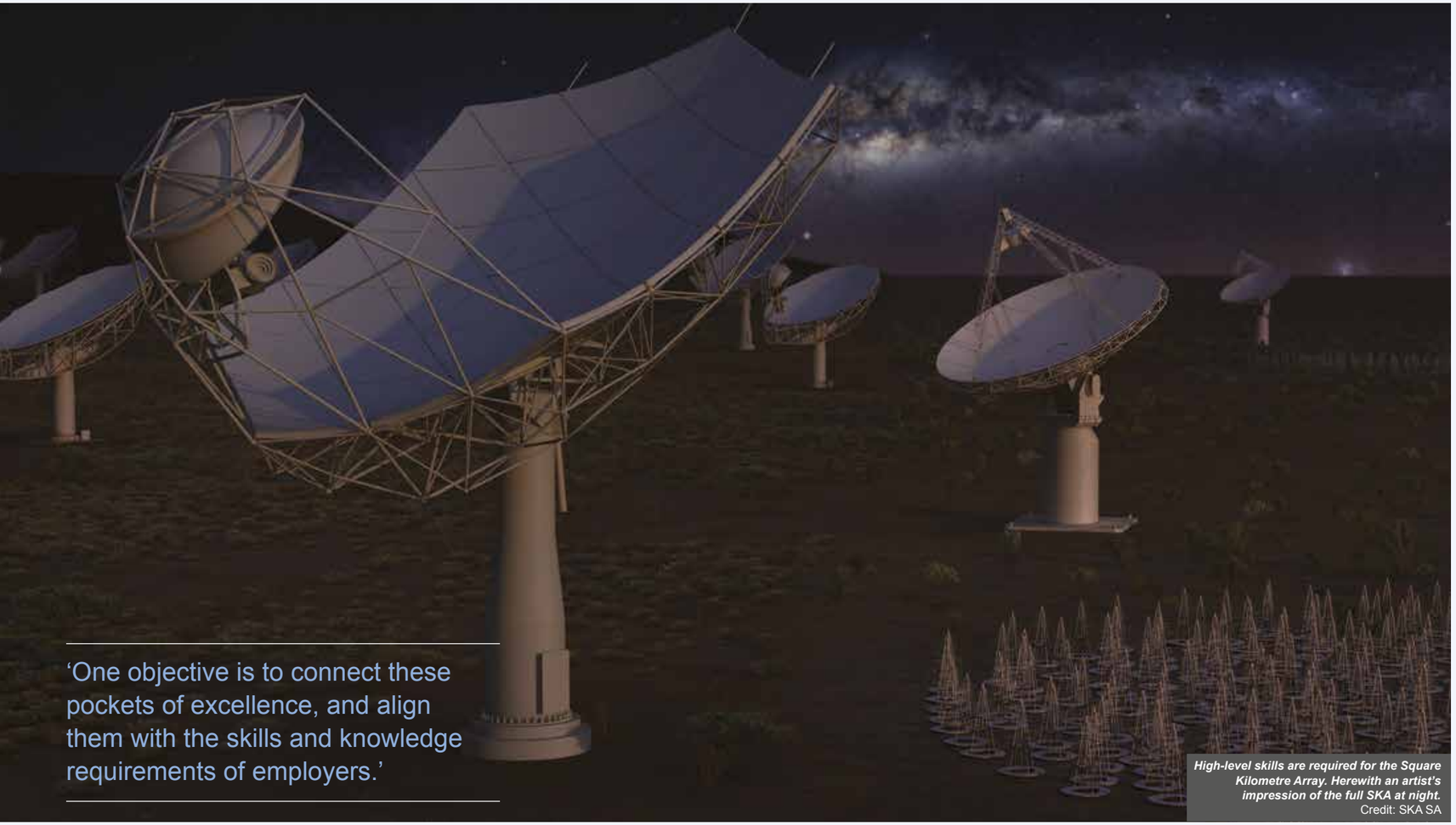
The Square Kilometre Array (SKA) telescope provides an example of such an achievement, and may provide lessons for science and education policy-makers. The SKA is a large radio telescope, currently in the design phase, which will ultimately consist of a network of 3 000 large radio receiver dishes and tens of thousands of smaller receivers constructed in aperture arrays. It will be built mostly in South Africa, with components in Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia, as well as Australia and New Zealand.

The SKA has also necessitated the formation of a global innovation network with universities, research institutes, science facilities, firms and government agencies from 11 SKA partner countries, collaborating to develop the advanced technologies required to design and build the telescope.

The knowledge challenges and skills needs faced by the SKA are extraordinary – including demands at the top the skills spectrum in the domains of astronomy, physics, cosmology, engineering, ICTs and management, and extending to artisanal and vocational skills required for site infrastructure.

The SKA deploys a range of strategies and mechanisms for meeting these needs. The most important of these is the Human Capital Development Programme (HCDP), a publicly funded skills development and research programme that between 2005 and 2014 awarded approximately 600 bursaries, grants and fellowships.

This progrmme has two main strategic roles. Firstly, to manage structures and mechanisms through which the skills needs of the SKA are assessed, including foresight exercises, through continuous engagement with scientists, engineers and management. Secondly, to engage with education institutions to strengthen their capacity to develop these skills. These roles are inherently dynamic, as technologies are rapidly developing, skills demands for the SKA are rapidly growing, and higher education capabilities are constantly evolving.



‘One objective is to connect these pockets of excellence, and align them with the skills and knowledge requirements of employers.’

High-level skills are required for the Square Kilometre Array. Herewith an artist’s impression of the full SKA at night.
Credit: SKA SA

The invaluable role of universities

HCDP administrators closely monitor bursary recipients and research positions supported by the programme, and maintain control over the range of disciplines, skills and research foci that are covered. Decisions about the distribution of funding are taken through intensive interaction with scientists and engineers, both within universities and within the SKA itself. Engagement with universities also takes place through an informal Universities Working Group, which provides a less structured forum for interaction. Personal relationships and networks are also critical – as precursors to formal interaction, as efficient communication ‘short cuts’, and as channels for the exchange of tacit knowledge.

The main university partners of the SKA include South Africa’s leading research universities, drawing on all the substantial pockets of excellence relevant to astronomy and related engineering and ICT that are distributed throughout the higher education system.

The overall institutional strength of these universities, manifested in strong capabilities in planning, internal capacity-building, career pathways development, student support and fundraising, provide the organisational competencies to support the development of niche areas of expertise and strong interactive capabilities within academic departments and research groups.

These niches have been highly responsive to the changing needs of the astronomy sector and the SKA: new curricula and courses have been developed, postgraduate research has been aligned with the future needs of the SKA, centres of astronomy, science and engineering research have expanded in line with the future requirements of the SKA, and strong informal relationships have been built with the SKA, as well as other actors in its innovation network, such as firms and science facilities. The strong interactive capabilities present at these universities thus form a critical part of the total interactive capability the SKA’s innovation network.

Universities also play intermediary roles that contribute to their overall interactive capabilities. One example is the National Astrophysics and Space Science Programme (NASSP), a nationally co-ordinated postgraduate programme based at UCT that includes teaching and supervision from all the universities active in astronomy in South Africa. Through this the NASSP aims to make the most of South Africa’s uneven and fragmented competencies and capabilities in the space science and astronomy domains. The NASSP steering committee and the structure that determines its curriculum include both SKA representatives and university academics, and are therefore important fora for these actors to create alignment and inform curriculum development that meets future skills requirements.

‘Universities also play intermediary roles that contribute to their overall interactive capabilities.’

The structure and characteristics of interactive capabilities differ across academic disciplines and research fields. In astronomy, interactive capabilities are largely vested within individual academics and at the departmental level. In engineering, faculty structures are critical, and provide examples of good practice in terms of responsiveness to the requirements of the workplace, including close relationships to the engineering professional body, and the encouragement of direct interaction with employers. For example, the provision of one day per week for engineering academics to work externally has made it possible for academics at a leading research university to consult for firms in the SKA’s innovation network and supply chain. This has also allowed them to form their own start-ups, often in partnership with postgraduate students or postdoctoral fellows, to participate in these networks and contribute to the SKA’s technology development efforts.

Engaging colleges for better quality graduates

Universities are not the only actors in the skills development landscape. Over the course of several years, the SKA has sought to engage with Further Education and Training (FET) colleges, but due to limited basic competencies at the colleges there have been few graduates produced from this engagement. Colleges have limited capacities to internalise planning and specific skills requirements. This is a reflection of South Africa’s FET system, which has been challenged by multiple policy changes, low levels of independence, and weak overall capabilities. However, the SKA has continued to engage with colleges in order to build internal competences and capabilities, and this is leading to a gradual improvement in the quantity and quality of graduates.

The rich and complex system of interactions that co-ordinate alignment between skills demand and skills supply for the SKA has connected and leveraged existing competencies, and orientated them towards the production of skills needed by the SKA. The case of the SKA reveals how, in highly unequal developing countries such as South Africa, interactive capabilities form a lever for access to the global science and technology frontier. For policy-makers, this highlights the potential of other knowledge-intensive sectors that are situated in a fragmented and unequal knowledge economy, but are characterised by pockets of excellence and the promise of attaining critical mass and international competitiveness.

Authors: Dr Michael Gastrow, senior research specialist, Education and Skills Development (ESD), HSRC; Dr Glenda Kruss, research director, ESD, HSRC; Dr Il-Haam Petersen, postdoctoral researcher, ESD, HSRC.

Bridging skills

Bridging the skills gap.

DEMAND and *SUPPLY*

in South Africa: the role of intermediary organisations

Government policy documents increasingly highlight the critical role intermediary organisations can play to bridge supply and demand. But what roles do such intermediaries tend to play, and how do we strengthen these to promote the achievement of policy goals? *Il-haam Petersen* and *Glenda Kruss* attempt an answer.

The White Paper for Post-School Education and Training (2013) sets out a vision for a more integrated and responsive post-school education and training (PSET) system to contribute to improving alignment between dynamic skills demand and supply.

Universities, Technical Vocational Education and Training (TVET) and community colleges, Skills Education Training Authorities (SETAs) and other skills providers will be expected to play a strategic role, engaging and consulting with business and government stakeholders, to more effectively link education and work in line with their distinct missions and mandates. To achieve these goals requires a new focus: on linkages, partnerships and co-ordination across the PSET system.

Government policy documents increasingly highlight the critical role intermediary organisations can play to bridge supply and demand. The Department of Higher Education and Training's policy has focused on the role of public intermediaries, such as the SETAs, in facilitating partnerships. However, other public intermediaries, such as public research institutes or professional associations, and private intermediaries such as industry associations and unions, may also play a linking and mediating role. They may facilitate linkages between firms and (groups of) universities or colleges to strengthen communication across the system, and facilitate coordination and alignment to address systemic weaknesses.

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Five key roles of intermediaries

We identified five distinct roles of intermediaries, and analysed how these roles are played by private and public sector intermediaries in three sectors – sugar, automotive and astronomy (SKA) – in South Africa.

Resource provider, funding and other material support: SETAs provide funding to public and private PSET providers; and private intermediaries provide training, as well as funding, on a limited basis.

Consultant, providing information and advice on skills planning: SETAs in the sugar and automotive sectors, for example, provided advice on accreditation of programmes; while private intermediaries such as the South African Sugar Association (SASA) and the Automotive Industry Development Centre (AIDC) acted as a knowledge repository for individual firms on skills needs and the skills supply pipeline.

Private intermediaries play a larger role in addressing skills mismatches at the sectoral level than is recognised in policy.

Broker, facilitating a transaction between two or more actors: In the sugar sector, the Department of Agriculture facilitated linkages between agricultural colleges and firms. In the automotive sector, the AIDC facilitated linkages between businesses and government bodies at the national and provincial levels.

Mediator, assisting organisations to form a mutually beneficial collaboration: Both private and public intermediaries across the three sectors worked with firms to identify skills needs, and communicate to government bodies. They negotiated work placement for students; with government and firms to support the capabilities of PSET actors, and to develop articulation and responsiveness to the needs of firms.

Co-ordinator, relationships across a skills development system: This could take the form of co-ordinating the skills activities of private sector actors – firms, industry and private research institutes. For example, SASA acted as an umbrella body for the sugar industry, coordinating research and skills development for growers and millers, to meet their current and future skills needs. It could also mean co-ordinating the programmes offered by public and private PSET providers. The Square Kilometre Array (SKA) Association established a human capital development programme to co-ordinate across, and enhance the responsiveness of universities and colleges, to develop skills for radio astronomy. It established an informal network between participating universities, to build the personal relationships that promote collaboration. Finally, this role could entail co-ordinating skills planning and development across public and private sector organisations. Some intermediaries operated in effect as 'public-private intermediaries', playing crucial roles in co-ordination across a sector, particularly where change is rapid. For example, the SKA project office played a distinctive role by prioritising not only the needs of the sector, but also national development goals.

Our evidence showed that private intermediaries play a larger role in addressing skills mismatches at the sectoral level than is recognised in policy, and that there is potential for public intermediaries to contribute more effectively to systemic functioning, through playing a co-ordinator role.

Promoting the roles of intermediaries in bridging skills demand and supply

Private sector intermediaries should be more widely recognised: they have the necessary expertise and social capital to provide and support sector-specific education and training and to enlist support from public intermediaries, especially the SETAs, as needed. One way to strengthen skills development systems is to increase funding support to private intermediaries who act on behalf of the sector, and not only in the narrow interests of an individual firm. Another way is to promote formal public-private partnerships.

Public sector intermediaries should play a larger role in co-ordination and bridging across employer networks, government bodies, and education and training organisations. They should extend their current practice of building bilateral relations, linking government and employers, or linking employers and education and training organisations, to build networks and coordinate skills initiatives across sectors.

SETAs are currently challenged to develop their capacity to function as brokers between industry, government and public education and training organisations, and as strategic partners for TVET colleges. Their interactive capabilities to perform these network-building roles need to be improved. To bridge supply and demand-side actors, SETAs should include representatives from public education and training organisations in their sub-sector committees.

Public-private intermediaries should take on the role of co-ordinating skills development activities across public and private domains, to coordinate skills development locally, to facilitate interaction, and manage relations between the diverse set of local stakeholders with each other and into global networks.

In conclusion, such evidence highlights the actors that can support stronger alignment between universities, TVET and community colleges, SETAs, government and firms. Clearly, a better understanding of the roles of a wider range of public and private intermediaries in skills planning and development can add value to current policy efforts to promote partnerships and interaction across the PSET system.

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HIGHER EDUCATION and ECONOMIC DEVELOPMENT: building interactive capabilities

There is more to the role and developmental impact of higher education than economic development alone. In a rapidly changing and technologically increasingly complex world, one core role for universities is to prepare young people for active participation in work and the economy. *Glenda Kruss, Il-haam Petersen* and *Simon McGrath* ask how universities can respond to the changing technological capabilities and skills needs of firms, particularly in relation to their professional and occupational programmes.

To address this question our research used an approach new to the South African skills literature, which is based on evolutionary economics and innovation systems. In this article we present a case study of the automotive Tier 1 component supplier sector in the Eastern Cape, to illustrate how such an approach can contribute to understanding the role of higher education in skills and economic development.

Meeting routine skills needs

In countries like China and India, the automotive sector has succeeded in technological capability building to the extent that local firms have become part of global innovation networks and, in turn, have created globally competitive national industries.

In South Africa, the sector remains strongly disciplined by global production chains with research and innovation conducted primarily at multinational headquarters. In our study, all the large original equipment manufacturers (OEMs) and many of the Tier 1 firms (component and suppliers) are multinational corporations. Their decision to stay and invest in their South African operations is subject to frequent reappraisal.

The government has prioritised the sector in its industrial policy strategies and it is well organised into industry associations with strong trade union presence. In the Eastern Cape, the sector is high among provincial and metropolitan economic development priorities. Representatives from industry, government and skills providers meet regularly and have a shared understanding of, and commitment to, the automotive sectoral system.

Nationally, a sectoral prioritisation and development programme initiated by the Department of Trade and Industry (dti) has been successful in that its incentives have kept the South African sector alive – but it does not provide a model for productive transformation. The programme lacked specific mechanisms to promote skills development and its benefits have been dominated by the small group of OEMs. Nor do the main component firms and sectoral intermediaries have co-ordinated strategies to promote research excellence, innovation or sector-specific skills.

In the automotive component sector as much as 70% of employment is at basic operative levels, with relatively little current demand for intermediate skilled workers or high-level engineers. Firms have developed effective strategies to address these routine skills needs and many have the capacity to deliver in-house training or source courses from private training providers.

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The automotive industry did not concentrate sufficiently on building capabilities for technological upgrading.
Credit: Tourism SA

The sourcing and upgrading of engineers is typically managed through interaction with universities, through bursary programmes, student placements and internships or leadership training.

In short, firms have the capacity to meet their routine skills needs, and interact with universities in traditional ways to meet their limited high-level skills needs.

A missing link: dynamic interactive capabilities

However, our analysis suggests that the automotive component sector is constrained by weak dynamic interactive capabilities. It has not concentrated sufficiently on sectoral co-ordination and networking, directly aimed at building capabilities for technological upgrading, so that it can be introduced more favourably into global production chains and innovation networks. That is, it does not have a strategy to meet changing skills needs, to grow jobs and productivity through sensing change, and to co-ordinate and integrate new mechanisms and structures in response to change. In this context, the question that arises is to what extent the four universities in the province currently evince the interactive capabilities to support such a dynamic strategy of technological upgrading.

Our analysis suggests that the automotive component sector is constrained by weak dynamic interactive capabilities.

Our network analysis shows that only one university is currently strongly inserted in skills networks with component firms. The other three universities provide graduates who may work in management or on the business side of component firms located in their region. While there are a few linkages to the management training programmes in three of the four universities, there are no structured science, engineering and technology-oriented programmes.

What are the distinctive features of the highly networked university?

- It has a historical practice of industry interaction, supported by its institutional culture, leadership and the disciplinary competences of its academics.
- The university has an employability-driven view of graduate attributes and a legacy of work-integrated learning linking students to industry.
- The university's interactive capabilities are reflected in external interface structures such as sectorally funded research chairs and research units and a technology station funded by government that focuses on technology transfer to small enterprises in the automotive component industry, providing design and prototyping services. Another critical external structure is the programme advisory boards inherited from the technikon tradition.
- In terms of dynamic interactive capabilities, the university has a strong institutional planning structure that informs strategic planning, quality enhancement and monitoring and evaluation of progress, reflecting its sensing and integrating capabilities.

The role of universities in local and global economic development

In this provincial sectoral system there are gaps in the interactive capabilities of three local universities, but the capabilities of one university are sufficient to meet the routine skills needs of firms. However, if Tier 1 firms are to be more competitive locally and internationally, then there is a critical role for universities to play going forward.

More universities in the region need to develop the dynamic interactive capabilities to network with component firms.

The dti should consider the skills component of targeted industrial policy to build domestic firms' technological capabilities.

More universities in the region need to develop the dynamic interactive capabilities to network with component firms to address changing skills needs and to raise productivity levels.

In terms of technological capability building for economic development, the universities in the region could support local firms in Tier 1 and Tier 2 (smaller, local suppliers to the main component suppliers) more effectively, whether through their graduates, research, technology transfer or training. As the main knowledge producers in the network, universities can contribute to enhance firm learning, if firms are to become more proactively introduced into global production networks.

There are no guarantees that a more innovative automotive components cluster can be achieved, given the global constraints under which it operates. Nonetheless, there is a pressing need to support the sector to continue as an important contributor of employment, exports and skills.

Policy implications: building interactive capabilities

Our case study highlights policy implications that focus on learning, capabilities and interaction. It enables the identification of strategies that may lie within the control and agency of firms, higher education and government.

Policies that prioritise target sectors should include a careful assessment of the national capacity to make the policy a reality, within the context of the global capitalist system.

The Department of Higher Education and Training (DHET) should work strategically with public and private intermediary organisations, as well as education and training organisations themselves, to create a distributed process of capacity development and network enhancement.

The dti should consider the skills component of targeted industrial policy to build domestic firms' technological capabilities.

Universities need to focus more on their own capabilities to learn and innovate within their own organisations, by developing a clear strategy, structures and interface mechanisms. They need to develop their capabilities to interact within skills development networks and systems, particularly in relation to priority sectors that match their academic expertise, whether in their immediate local context or nationally.

In sum, the automotive components case study serves as a cautionary tale, demonstrating the need for a realistic view of the local, national and global conditions impacting on development, while at the same highlighting the potential role universities can play in economic development if they build their dynamic interactive capabilities more strategically.

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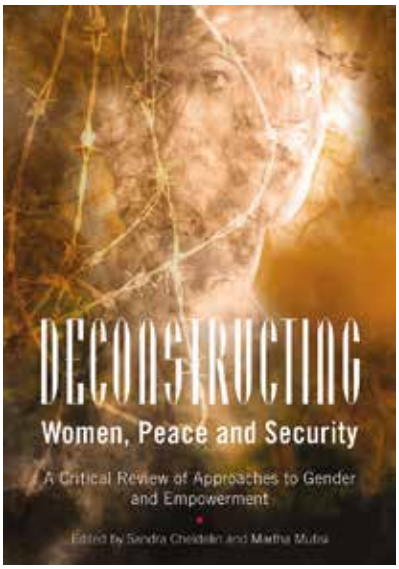

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Deconstructing Women, Peace and Security

A critical review of approaches to gender and empowerment

About the book

The unprecedented United Nations Security Council Resolution 1325, established in 2000, radically addressed what we knew about warfare – that civilians and especially women were increasingly targeted – and called for a sea change in the ways women should engage in any rebuilding processes – including conflict management, governance, and peacebuilding efforts. Deconstructing Women, Peace and Security offers a critical review and analysis of many gender-based efforts implemented since 2000, including empowerment policies, strategies, and an in-depth study of four particular cases. It calls out the need for conceptualizing gender as a social structure in policy construction. It assesses the 'good intentions' of policies designed and implemented with core beliefs they will be good for women. It provides an important case-based analysis of what is (and is not) working.

The book's critical review of the rights and protection of women and empowerment efforts is organised around initiatives in nearly a dozen African countries. The data are also informed (and confirmed) outside the continent in Nepal, Sri Lanka, Egypt and Indonesia. The authors have unique expertise and provide solid case-based analysis of many empowerment initiatives.

Promoting women's empowerment has become an unequivocal objective of many governments, development organisations and international agencies. While important initiatives have been put in place, education campaigns – for men and women – regarding human rights, gender empowerment and efforts to create sustainable peace are still sorely needed. The book offers case-based data to engender inclusivity in all peace and security processes.

The socioeconomics of livestock keeping in two South African communities

A black man's bank

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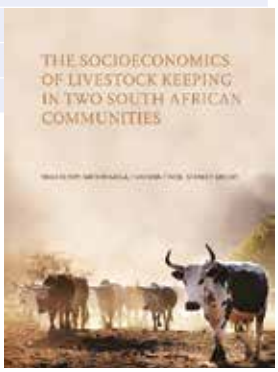

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About the book

The South African government has prioritised a reduction of poverty and increased food security in rural parts of South Africa through agrarian transformation. As the bearers and beneficiaries of rural development initiatives, smallholder farmers, including those keeping livestock, loom large in this arena. Likewise, on international development agendas steered by bodies such as the FAO (Food and Agriculture Organisation), smallholders are prioritised as the engines of national economies.

This book, based on a pilot study of two livestock keeping communities along the Mpumalanga–Limpopo border, explores smallholder households in order to paint a picture of the challenges faced by smallholder livestock farmers, the practices and knowledge of primary animal healthcare (PAHC) among these farmers, relationships between the state and the smallholders, gendered issues, and the relationship between poor socioeconomic conditions and the keeping of livestock. This book opens up a variety of research and policy questions that encourage further exploration and study.

Balancing multiple mandates

The changing roles of science councils in South Africa

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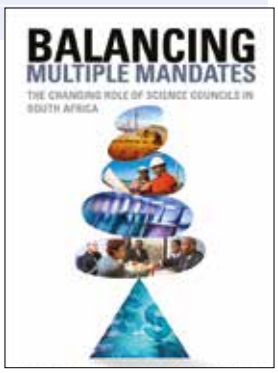

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About the book

Science councils have been tasked with complex new mandates, to achieve these they have to interact with knowledge users in the private and public sectors and be of benefit to communities, particularly to those that are vulnerable and marginalised.

What are the diverse forms of interaction in science councils with distinct legacies, what are the diverse forms of partners and what are their outcomes? What are some of the successful strategic policy interventions, organisational structures and internal incentive mechanisms that science councils have created to channel and promote these interactions?

Questions such as these are addressed in this timely and groundbreaking research as it investigates how scientists interact with actors in the informal sector, social development and community spaces, alongside their role in technology development for industry and government actors. *Balancing Multiple Mandates: The Changing Role of Science Councils in South Africa* is an important study that builds an evidence base to inform the contribution of science councils to innovation, poverty reduction and inclusive economic development in South Africa.