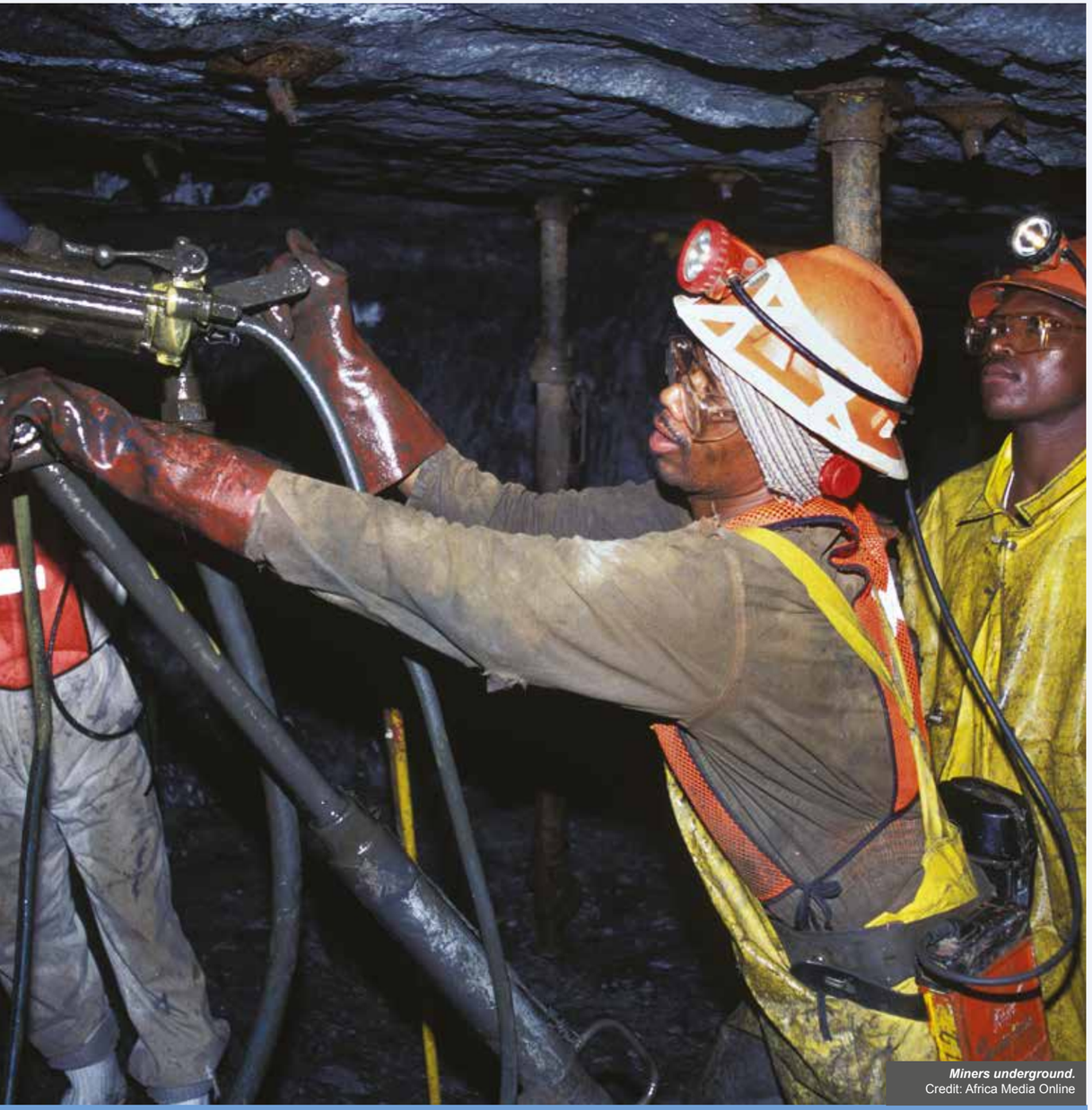


Miners underground.
Credit: Africa Media Online

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.

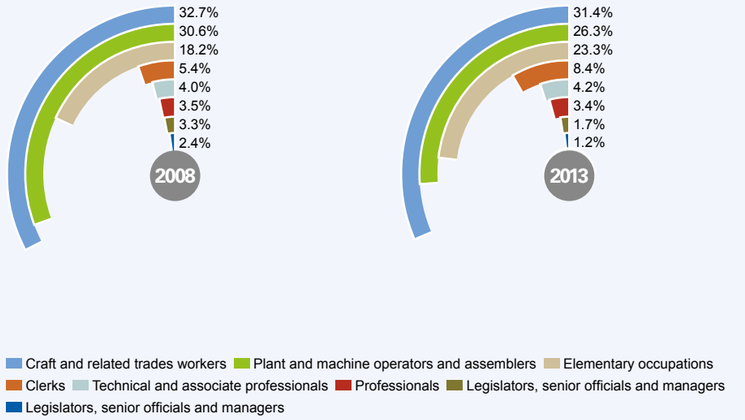
Data from a recent study by Wildschut et al on artisanal occupational milieus and identities indicated there was a growing trend to employ higher (professional) and lower-level (clerks and elementary) occupational categories. Table 1 shows that there was also an increase in intermediate-level occupations, 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.