LABOUR MARKET
INTELLIGENCE PARTNERSHIP

POLICY BRIEF

Why changes to occupational domains matter for artisanal skills planning in South Africa

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Introduction

Artisan training in South Africa has come under the spotlight to address a major gap in the labour market at the intermediate skills level and to contribute to social and economic development. To these ends, research in recent years to estimate the demand for artisanal skills and to assess the capacity of the supply side institutions to meet this demand (Mukora, 2009, Elliot, 2009, Kruss et al, 2012). While this information is of course necessary, it is not sufficient to inform successful planning and interventions. Mechanistic demand-supply calculations do not reflect the complex set of economic, political, technological and social dynamics shaping artisanal skills development in South Africa.

This Policy Brief argues that we need a more nuanced understanding of the shifting boundaries of artisanal work and occupational domains. In particular, it presents two key findings emerging from research that evaluated changes to the nature of artisanal work across three trades in South Africa (Wildschut & Meyer, 2016). The main findings are:

1. That there has been an <u>expansion in</u> and an <u>elevation of</u> the knowledge and skills required for artisanal work.
2. That the tools associated with artisanal work are changing with the potential to impact the boundaries of defined occupational domains.

In reflecting on the implications of these results, this Brief[1] also presents key considerations for policymakers charged with the planning to revive and reconfigure artisanal training and employment in South Africa.

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1   This brief is based on one of the three projects under the Labour Market Intelligence Partnership that aimed to address such questions: the first investigated the underpinning economic and political history of artisanal training and employment (Mbatha et al 2014); the second, changes to the nature of artisanal work and its organisation (Wildschut et al 2016); and the third, changing intermediate knowledge bases and the resulting implications for future artisanal work and preparation (Gamble 2016).

Expansion and elevation in knowledge and skills required for artisanal work

The environments in which artisans now practice their trades are placing at least two noticeable demands on artisan skillsets. Our evidence suggests that skills requirements for artisans are perceived to have *expanded*. This means that there is an expectation by employers that artisans should have more generic skills, including those not traditionally associated with artisanal work. Three clear examples emerged:

- Artisans are increasingly required to plan their work in relation to daily, weekly and monthly schedules, and to organise and manage their time in relation to the work of other occupational groups
- Artisans are required to identify, financially plan for, and procure parts required for maintenance and breakdown-related tasks.
- Artisans are required to compile and present breakdown reports (within a team setting) as well as hand-over reports upon completion of shifts.

These 'new' expectations stand in stark contrast to the 'old-school era', where artisans simply arrived at the breakdown scene with their toolbox, and walked away upon completion of the repair job, with all administration-related aspects being left to a supervisor or engineer for processing.

> "In the old stage you just started say, a pump, by hand…But now it's automated, you have a PLC, a computer system and it reads the demand, and as the demand grows another pumps starts automatically... It's automation..." (Artisan, Millwright case).

There has also been an *elevation* in artisan skillsets. The level of abstract knowledge artisans now require in their daily work practices is perceived as having increased. This view is shared across all occupational groups in the study. Increasing incorporation of automation technologies and the impact of more globalised labour processes are perhaps the most significant drivers of this. Two clear examples of such an expectation emerged in the research:

- Artisans are increasingly expected to apply and be proficient in new technologies like Programmable Logic Controllers (PLC) and/or Supervisory Control and Data Acquisition (SCADA) systems. In the case of millwrights for example, the incorporation of PLCs represent a significant change to production processes that in the past were largely manually controlled. As a consequence millwrights are required to be more technologically skilled in order to perform activities that are increasingly electronic and computerised.
- Another example is that of mechatronics, a new and emerging multi-disciplinary field of training, qualification and practice. The newly recognised occupation of a mechatronics trades worker promises an individual that has a broader *and* higher level of knowledge and skills in comparison to traditionally trained artisans. This case is probably the best example that traditional notions of artisans as being primarily practically skilled as opposed to possessing theoretical knowledge is changing. This is causing contestation and perceived changes to the scope and level of artisanal work and, thus, also the demarcation of the work of technicians within this field of practice.

Overall, research data suggests both real and perceived change to the knowledge and skills expected to be held by artisans. Using the project's conceptual frame as a visual reference point, this could be illustrated in expanded **skills** and **knowledge** components within the artisan occupational domain circle (Figure 1), as well as a shift upwards into the domain of technicians.
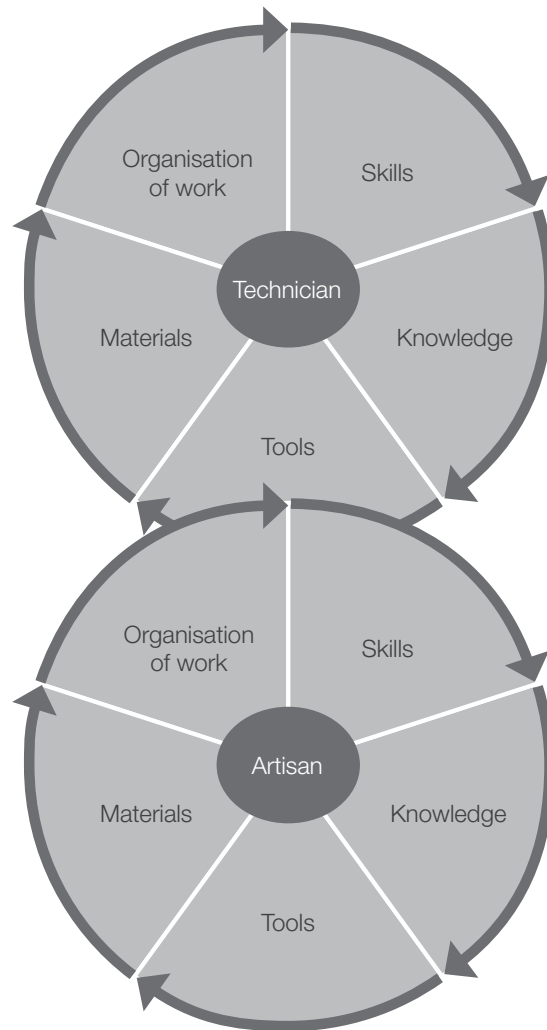
Figure 1. Conceptual frame for investigating change in the boundaries between occupations

A changing occupational domain

> "Artisans need to be able to read a little bit more…it's no longer about you working with your hands it's also more about reading papers about different technologies…to understand what is happening in those areas." (HR professional, Electrician case).

The increased computerisation and automation of production processes has also impacted on other areas of artisanal work. Our evidence confirms that there has been a general reduction of artisan involvement in direct production and some tasks have either been combined or, in some cases, eliminated altogether. Two important implications for the notion of artisanal work that arise from this trend:

• Distance is created between the artisan and the material he/she works with, either reducing or shifting the manual component traditionally viewed as paramount to describing artisanal work.
• Since new technologies can combine (or eliminate) certain tasks within an occupational domain, the constructed and delineated scope of artisanal work in relation to other occupational groups can be dramatically affected.

PLCs, for instance, are clearly recognised as potential *expanders* of the work of artisans. As this threatens the traditional scope and level of work and practice of *technicians* most strongly (refer to Figure 1),

contestations between the two groups were found. Technicians tried to maintain their occupational position by constructing PLC work to fall firmly within their scope of practice, while artisans contested such claims. Mechatronics apprentices for example, rejected such claims by asserting PLC work to be part and parcel of the work of artisans in present work contexts.

> "I don't sit and maintain the robots…I do the initial installation – complete turnkey, which is the integration between the robot, the PLC, the SCADA system… I plan and manage…. I do all the costing… the purchasing… I have to give daily feedback on that but I've had people doing all the work – the actual installation" (Technician, Mechatronics case).

Thus, what is essential to highlight is that some tasks are very significant to an occupational identity and the elimination of such tasks can threaten occupational status. In this regard, diagnostic and fault-finding skills have always been essential to describing the work of an artisan, but technology can disrupt or alter the relation between materials and the tools used for artisanal work to such an extent that it calls into question whether such skills are still applied within the occupational domain.

> "I will plug in my laptop, do a diagnostics – where is the problem? What needs to be replaced…. I also make slight programme changes on PLCs, modify present operations, HMIs, setting your drives…" (Apprentice, Mechatronics case).

But our data also suggests that while technology might alter the relation between particular skills and the materials and tools used for artisanal work, this does not remove the need for such skills. This was strongly illustrated in the electrician case study where artisans particularly emphasised that the 'material' they work with is electricity and this has not changed. So while technology has automated and provided different tools for problem solving, the material and logic underpinning decision making is seen as remaining the same. And while the manual dimension of artisanal work is shifting, manual abilities continue to construct the occupational identity very strongly.

Reviving and reconfiguring artisan training and employment in South Africa: Research and policy challenges

> "The apprenticeship system has been allowed to deteriorate since the mid-1980s, resulting in a shortage of mid-level skills in the engineering and construction fields." (DHET, 2013)

Widespread claims suggest artisanal skills shortages to be a binding constraint on economic growth. Over the past two decades, therefore, debate about artisan skills development in South Africa has focussed on the validity of the current system and how the system can be reformed in a democratic, inclusive South Africa. Specifically, the establishment of a good artisan training system has been identified as an urgent priority towards reaching the goals of the National Development Plan (NDP) and, more generally, in supporting the drivers of growth and social development in South Africa. What research and policy interventions do we need to be focusing on moving forward?

Research

Balancing quantitative with qualitative data

With strict and ambitious targets to reach, the empirical approaches that predominate in identifying skills needs in the labour market tend to be largely quantitative. The identification of artisanal skills needs has

followed this trend. There is much less of a focus on understanding the contextual drivers of supply and demand. Yet, South Africa has a very particular history of technical, vocational education and training, characterised by a complex interplay of inequalities based on gender, race, age and language. This calls for a far more nuanced understanding of the past, present and future contexts underlying and impacting on the extent, nature and location of demand and supply of artisanal skills. Equally critical to the research agenda, then, are questions such as:

- How have historical patterns shaped the nature of artisanal training and employment today?
- How can planning for artisanal skills respond to the changing nature of work and the division of labour in the workplace?
- How can planning be responsive to innovation and change?

The need to understand what is happening within occupations

While occupation, sector and geographic region will remain critical variables by which work change can be analysed (DoL, 2003), the findings from research reported in this Brief highlights that we need to pay much more attention to what is happening *within* occupations. Work change can affect occupational scopes of knowledge and practice in sometimes radical ways. Moreover, elements within a field of occupational practice might also be shifting, which would of course have implications for skills needs. The lesson then is this: Occupations cannot be equated with a static collection of skills, knowledge bases and competencies.

The policy messages

Technology changes occupations, but the impact might be uneven and unexpected

Labour market policy discourses clearly suggest that artisans, at present and for the future, require greater generic proficiencies as well as technological prowess. Yet, the research found the requirement for this broader and elevated knowledge and skills to vary substantially by the type of trade, sector and firm size (and in some instances even within firm departments). Changing technologies presents a set of challenges for present day artisans: it impacts on the occupational identity as much as it impacts on the relation between the artisan and his/her tools and manual abilities. This suggests that *the changing nature of artisanal work and its impact on the demand for particular artisanal skills have to be assessed more regularly.*

Occupational jurisdictions are not fixed

Research highlighted how contestation around tools between occupational groups can be reflective of occupational domain change. This information can be used to inform skills planning in the following ways:

- This can inform assessment of the appropriateness of occupational description used for planning,
- Because it touches on the sociological dimension that impacts critically on individual and group behaviour at work, such information can be useful in assessing the likely success or failure of potential skilling interventions, as well as identifying occupational identity factors that might be hampering productivity, growth and equality.

Widening approaches to skills planning decision-making

Diverse factors need to be taken into account when making skills planning decisions. Occupations are comprised of a range of elements, which in and of themselves are affected by work change. In order to realise greater and more adaptive workforce capacity as a means to address skills mismatches, skills shortages and other forms of labour market failure, it could be useful to consider other frameworks of understanding skills. Ideas emerging from the Australian literature, for instance, suggest that the concept of **vocational streams** (Yu et al, 2013), which shifts the thinking away from the view that particular collections and levels of skills are only accessible in particular occupations, may be instructive for South Africa.

Conclusion

As occupational contexts increasingly shift, changes to work and occupational jurisdiction are pertinent issues requiring more extensive engagement from policymakers in attempts to plan for the provision of artisanal skills. This policy brief has highlighted critical questions to influence future policy direction in a way that takes contextual, sectoral and occupational realities into account.

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