MAPPING PARTNERSHIPS AND INTERACTIVE CAPABILITIES IN SKILLS DEVELOPMENT SYSTEMS

A framework and methodology to guide research

***RESEARCH INSTRUMENT 1**: This research guide introduces a new research framework, design and methodology that can yield evidence that complements and adds to the quantitative data traditionally used for skills planning. Specifically, the focus is on understanding interaction in skills development systems, and the capabilities of education and training organisations to form effective partnerships and learn through interaction – i.e. interactive capabilities. The guide should be read in conjunction with a set of fieldwork guides and templates for research in universities, TVET colleges, firms and intermediaries such as the Sector Education and Training Authorities (SETAs).*

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LMIP PROJECT: A STUDY OF LABOUR MARKET INTERACTIVE CAPABILITIES, STRUCTURES AND MECHANISMS IN DIVERSE POST-SCHOOL EDUCATION AND TRAINING INSTITUTIONAL SETTINGS

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ACRONYMS

AET	Adult Education and Training
DHET	Department of Higher Education and Training
HSRC	Human Sciences Research Council
LMIP	Labour Market Intelligence Partnership
PSET	Post-school Education and Training
SETA	Sector Education and Training Authority
SKA	Square Kilometre Array
SMME	Small, Medium and Micro Enterprise
SSI	Sectoral System of Innovation
TVET	Technical and Vocational Education and Training

Introduction

In 2012, the Department of Higher Education and Training (DHET) commissioned the Human Sciences Research Council (HSRC) to lead a national research consortium, *the Labour Market Intelligence Partnership (LMIP)*, to support it in creating a strategic labour market intelligence system.

This set of research guides is based on an LMIP project: *A study of labour market interactive capabilities, structures and mechanisms in diverse post-school education and training institutional settings.* The study investigated ways in which alignment between public and private education and training providers, and firms and labour markets, can be improved. The researchers designed a framework and a set of instruments for collecting and analysing data on organisational capabilities and interaction in skills development networks. It used these to analyse practices within three sectoral systems: sugarcane growing and milling in Kwa-Zulu Natal, automotive components manufacturing in the Eastern Cape, and astronomy, specifically the Square Kilometre Array big-science project.

In a changing policy landscape, universities and TVET colleges are challenged to improve their responsiveness to skills needs, and Sector Education and Training Authorities (SETAs) are expected to improve their performance as intermediaries (see DHET 2013). New regulatory instruments require that these post-school education and training organisations work more closely with key stakeholders in their local settings, such as firms and local government. To improve responsiveness, universities, TVET colleges and SETAs are required to improve their understanding of skills needs in their local settings, and gather information on their partnerships and interaction with other education and training organisations, employers, and so on.

The LMIP research team thus offer a set of research guides, as one set of tools skills and strategic planners and researchers in the DHET, universities, TVET colleges and SETAs can use to inform their skills planning processes. We offer a conceptual framework, practical guidelines and instruments for research on skills development partnerships and networks, and the capabilities of universities, TVET colleges and SETAs to form effective partnerships towards improving alignment between skills demand and supply.

Purpose of this research guide

This research guide **(Research Instrument 1)** introduces a new research framework, design and methodology that can yield evidence that complements and adds to the quantitative data traditionally used for skills planning. Research using this guide will produce in-depth evidence to inform building partnerships and networks in the post-education and training system that are so critical to successful skills development, and the capabilities to effectively use partnerships to inform teaching and learning – i.e. interactive capabilities.

This document should be read in conjunction with a set of fieldwork guides and templates as listed in Table 1 below. Each focuses on a key type of organisation in skills development systems: universities, TVET colleges, firms, and intermediaries. **Research Instruments 3 to 6** provide detailed practical guidelines and instruments for gathering information on partnerships and interactive capabilities. We also include two other documents: **Research Instrument 2,** which provides a

template for conducting a sectoral overview that can be used to inform the fieldwork, and **Research Instrument 7**, which provides a guide to analysing the information gathered.

Table 1 Description of the research guides

Document number	Description of document
1	**A framework and methodology to guide research**
2	Guide and template for conducting a sectoral overview
3	Fieldwork guide and template for research in universities
4	Fieldwork guide and template for research in TVET colleges
5	Fieldwork guide and template for research in firms
6	Fieldwork guide and template for research in SETAs and other intermediaries
7	Data management and analysis strategy and instruments

Structure of this research guide: A framework and methodology to guide research

Section 1 introduces a bottom-up approach to skills planning and development based on an innovation systems framework.

Section 2 introduces a new research design and methodology**.** The section describes in detail a procedure for gathering information on skills development partnerships and networks, and the capabilities of universities and TVET colleges to form effective partnerships and learn through interaction. It is also possible to focus on firms and intermediaries in the same way.

Section 3 includes a list of useful readings.

Key terms and concepts

Table 2 provides a summary of the key terms and concepts used in this document. It is a useful glossary that can be referred to repeatedly, in each section of the guide.

Table 2 A summary of key terms and concepts

Sectoral system of innovation	"(S)ets of actors organised around specific types of productive activities and technologies" (e.g. sugarcane milling), within distinct geographical (e.g. in KwaZulu-Natal) and institutional settings (e.g. policy)[1].
Competencies	The pre-set attributes of organisations (and individuals), including expertise, human resources, organisational routines and structures, technologies, formal policies or other physical resources [2].
Interactive capabilities	The capacity to form effective linkages with other organisations and use existing competencies to learn through interaction[3].
Dynamic interactive capabilities	The capacity to sense changes in the environment relevant to the organisation, and take an effective and timeous response through strategic management.
Institutions	Rules or guides for behaviour, distinguished between: formal (e.g. national policy) and informal (e.g. organisational culture), binding (specific regulations) and created by interaction (e.g. contracts), national (e.g. patent system) and sectoral (e.g. sectoral labour markets) institutions.
Social skill	The ability to form linkages, work in a team and "induce cooperation among actors in an organisation or any other field"[4].
Post-school education and training (PSET)organisations	Diverse set of private and public education and training organisations – that is, universities, universities of technology, vocational education and training organisations (TVET), private colleges, private higher education institutions, and other training providers (e.g. AET public and private institutions, training centres operated by industry associations, etc.).
Sectoral intermediaries	Organisations in sectoral systems of innovation that facilitate interaction, and translate and facilitate information flows[5] as well as offer services (e.g. training) that are not easily available in the system but are essential.
Private intermediaries	Sectoral intermediaries such as industry associations and research institutes that tend to focus more on industry or firm-specific issues.
Public intermediaries	Sectoral intermediaries such as SETAs that tend to focus on public good objectives, especially those related to policy.
Actors	Participants or stakeholders in skills development systems, which could include individuals, organisations or units within organisations.

[1] Malerba (2005)
[2] See von Tunzelmann and Wang (2003)
[3] von Tunzelmann and Wang (2003, 2007 in Iammarino, 2009)
[4] Fligstein and McAdam (2012: 46)
[5] van Lente et al (2003: 248)

Section 1. A bottom-up approach to analysing dynamic skills demand and supply

The research tools provided in this guide are based on a framework that captures the dynamics and complexities of skills development systems. It recognises the need to go beyond numbers to develop targeted interventions for skills planning and development. Different types of employers – whether small, medium or large or non-profits, and whether in resource-based, manufacturing or services sectors – respond in different ways to global and local shifts, new technologies and new knowledge. Similarly, post-school education and training (PSET) organisations, in producing skills, respond in diverse ways to government policy and skills demand. An understanding of skills demand and supply has to take these factors into account if it is to reflect 'skills development realities'.

Explaining the framework

Universities and TVET colleges are challenged to better prepare students to enter the labour market and be more responsive. Institutional planners, college managers and strategic planners thus need an improved understanding of routine skills needs and drivers of changing skills needs in their local economic contexts. Such an understanding requires interaction with employers, SETAs and other key intermediary organisations in the local economy.

We thus propose a **bottom-up approach to skills planning and development based on an innovation systems** framework that emphasises **interaction and alignment** between the **needs and capabilities** of the different types of stakeholders in skills development systems – firms, government departments and agencies, post-school education and training (PSET) organisations, trade unions, research organisations, industry associations, and so on. The approach is dynamic and emphasises change over time, but also how history shapes what is possible. In this research guide, the focus is on analysing **'interactive capabilities'** of PSET organisations – i.e. the capacity to form effective partnerships and learn through interaction[6]. A good example of college interactive capabilities is an advisory body on which local industry and universities serve, which is a potentially useful mechanism for facilitating interaction between the college and key stakeholders in the local economic context. Another example is the sub-sector committees of SETAs (e.g. AgriSETA's Sugar sub-committee, merSETA's Automotive Chamber) that serve as forums for key employers, unions and industry associations to meet to discuss general issues and challenges they may face. The committees are potentially useful mechanisms for facilitating interaction among the range of stakeholders in the skills development system.

A sectoral system of innovation (SSI) approach provides useful analytical tools for analysing skills development systems. The SSI framework considers the differences between sectors in terms of their knowledge bases, skills needs and conditions, rather than focusing on industrial concentration. Within the SSI framework, a sector is defined as 'a set of activities which are unified by some related *product groups* for a given or emerging demand and which *share some basic knowledge'.* [7] So for example, the actors within the sub/sectors governed by MerSETA share a focus on metals and engineering related product groups, and they share a knowledge base of engineering and other technological processes that all those who work in the sector will need to acquire. While the

[6] See von Tunzelmann and Wang (2003, 2007 in Iammarino, 2009).
[7] Malerba (2005: 65).

framework emphasises activities at the sector level, it considers the influence of stakeholders at the national, regional and local levels (e.g. national and provincial government, and professional and occupational bodies).

It should be noted that we are not suggesting that universities and colleges start analysing and building sectoral systems of innovation. Rather, we propose that universities and colleges begin to apply a more systemic, bottom-up approach in their planning and interventions aimed at improving responsiveness.

Figure 1 below provides a generic representation of the actors and interactive capabilities in a sectoral system of innovation in the South African context. It highlights the need to **outline or map the existing structure, the key role-players, and mechanisms/strategies used in skills development networks.**

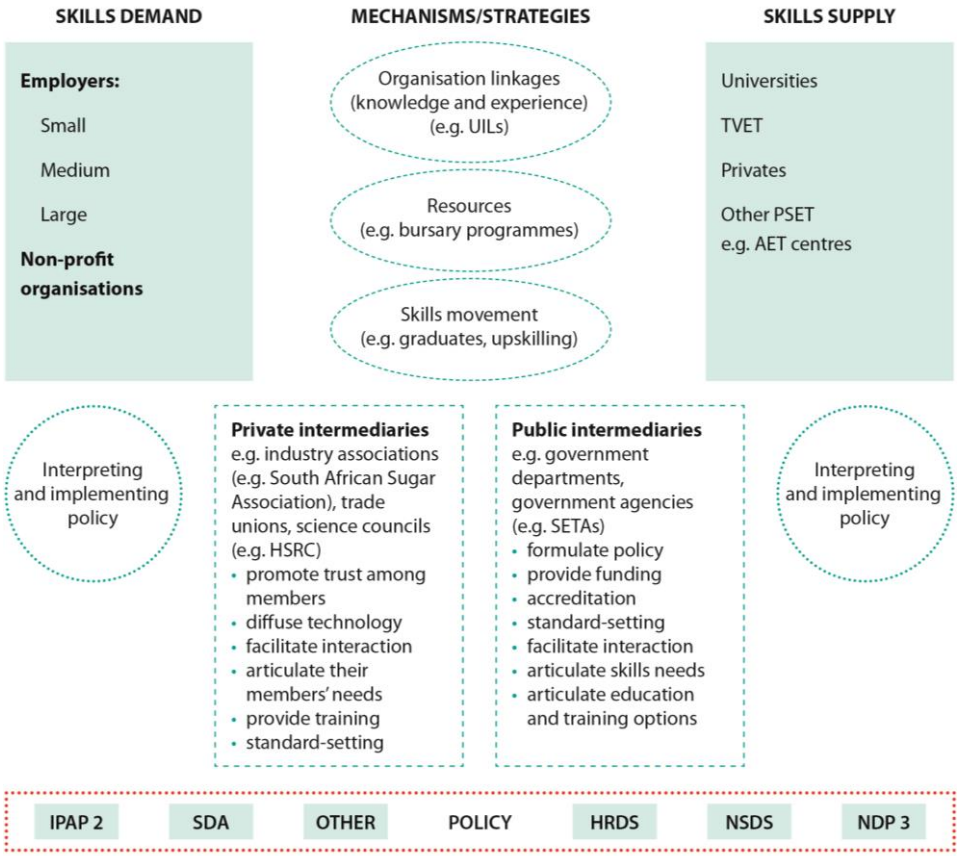


Figure 1 Sectoral systems of innovation framework for analysing skills development systems

On the left hand side, we describe the relative size of groups of employers operating on the demand side: whether small, medium or large or not-for-profit, including domestic and international firms and informal entities such as smallholders. Each group is likely to have distinctive skills needs. The framework highlights the need to investigate the **strategies and mechanisms** that employers use for meeting their **routine and changing skills needs** to improve skills planning strategies and skills

development interventions. Such an analysis may provide signals as to how education and training organisations, in their role as supply-side actors, can and do play a role in addressing skills needs.

On the right-hand side, we analyse the different types of PSET organisations that could be addressing skills demand in a sector – whether public TVET colleges, universities or universities of technology, private TVET colleges, private HET providers, AET providers, or other skills development programmes such as those involving apprenticeships, learnerships, work-integrated learning (WiL) or workplace-based experience (WBE). According to this framework, apprenticeship, learnership, WiL and WBE programmes are identified as mechanisms for interaction.

The circles in the middle of the diagram represent examples of the typical mechanisms and strategies used to link supply and demand. For example, there may be flows of financial resources, whereby firms provide scholarships and bursary programmes to meet their future skills requirements. Varying degrees of direct involvement are possible, that could include knowledge flows as well. For instance, a firm may host artisans or college students for workplace training, or university or college lecturers work in the firm to update their experience. Hence, different types of partnerships such as 'firm-university' partnerships for work-integrated learning and 'SETA-TVET college' partnerships are identified as mechanisms for interaction in this framework.

Between the left and the right-hand sides, we identify the intermediary organisations that serve to connect employers and PSET organisations, and align their goals. In the public sector, intermediary organisations include government departments, agencies like SAQA or QCTO, and critically, the facilitative and coordinating roles played by SETAs. In the private sector, intermediary organisations include industry associations (e.g. SA Canegrowers Association), professional bodies (The Engineering Council of South Africa-ECSA), research institutes, and so on.

Each of the actors is embedded in wider institutional environments, which shape and are shaped by their activities. Hence, at the very bottom of the diagram, we include examples of the main global, national or regional policy mechanisms that could be shaping demand in a sector, or influencing education and training supply. Firms, PSET organisations and intermediary organisations interpret policy and, depending on their interactive capabilities and strategic goals, respond in different ways and to varying degrees.

A focus on universities' and TVET colleges' interactive capabilities

How competencies, interactive capabilities and dynamic interactive capabilities are understood in our framework is illustrated in the figure below. The examples of structures and mechanisms are included for **illustrative purposes rather than being prescriptive**.

We focused our in-depth analysis on universities and TVET colleges, but firms and intermediaries could be analysed in a similar way.

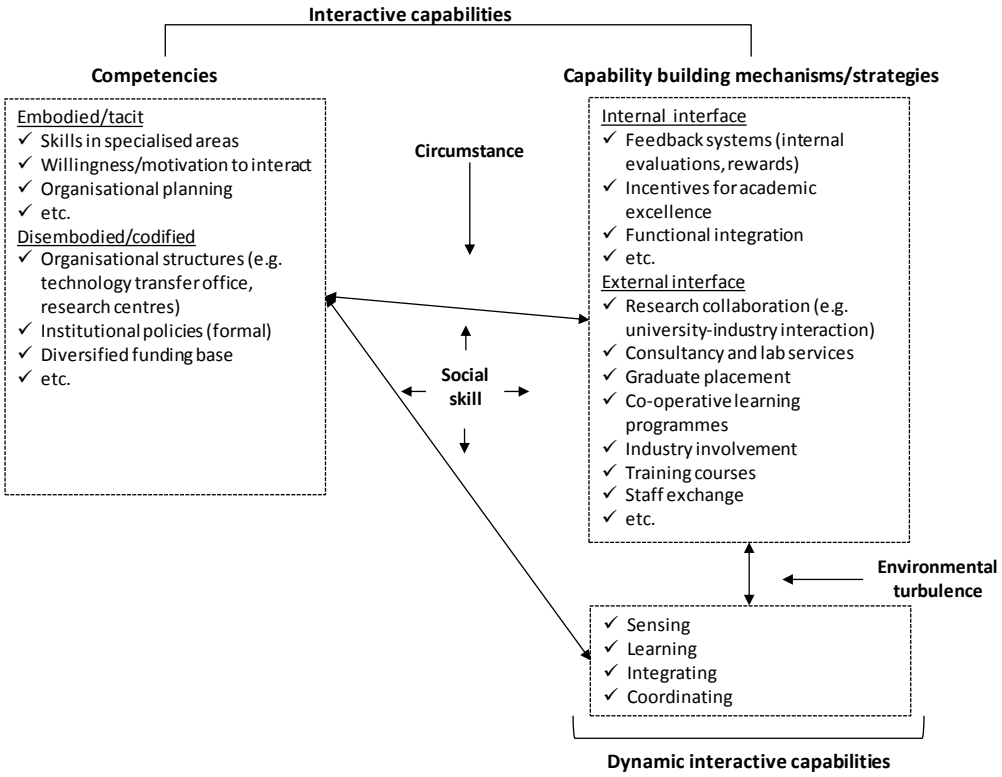


Figure 2 Framework for enhancing universities' and TVET colleges' competencies and capabilities

Note: The diagram illustrates some generic competencies, and internal and external mechanisms required for building interactive capabilities. The lists of examples are thus not exhaustive.

Competencies refer to knowledge, held at the individual or organisational level, that facilitates the formation of effective partnerships and learning through interaction to improve responsiveness. We distinguish between *tacit competencies* that are embodied in human resources and organisational routines, and *codified competencies* which include appropriate formal structures, formal policy, technology, and other assets.

External interface structures refer to the different mechanisms and strategies universities and TVET colleges use to interact and partner with other organisations such as firms and other education and training organisations. Whereas *internal interface structures* refer to the mechanisms and strategies they use for learning and accumulating knowledge gained through their interactions, essentially how

they use the knowledge to inform their teaching and research. We argue that the effectiveness of a university or college's internal and external interface structures depends on the appropriateness and effectiveness of its competencies and vice versa. Universities and colleges can build and refine their competencies through their internal and external interface structures. In this way, a university or college builds its *interactive capabilities*.

Figure 2 also highlights the need for *dynamic* interactive capabilities, i.e. the ability to sense relevant changes in the environment and effect an appropriate response which may include putting in place a new routine or unit, improving coordination, integrating change across the university or college, and so on. The social skill of university and college leaders and academic champions is thus important for building such capabilities. We argue that the policy, educational and business environments influence opportunities available. One example is national policy that promotes and funds university/college – industry interaction. Another example is how rapid change in technology leads to new skills needs in a specific sector, prompting firms to work more closely with universities and colleges to ensure a pipeline of appropriately skilled human resources.

Section 2. Research design

We developed a case study design, with the empirical boundaries defined by a sectoral system of innovation (SSI), using a combination of:

- desktop and data-based research
- key informant interviews at different levels within the firm, intermediary and education and training organisation

The design of the research is illustrated in Table 3 below. The research templates for conducting each phase are set out in separate documents: **Research instrument 1 to 7.** Below we will refer you to how and at which stage of the research each of these documents should be used.

Table 3 Case study research design

	STEP 1 - DESKTOP RESEARCH	STEP 2.1 - FIELDWORK INTERVIEWS	STEP 2.2 - ANALYTICAL TEMPLATES	STEP 3 - FIELDWORK REPORTS	STEP 4 - CASE STUDY REPORT
SECTOR LEVEL	Sector background paper **(Research Instrument 2)**			Report on partnerships and networks **(Research Instrument 7)**	**Integrated case study report (Research Instrument 7)**
FIRMS	Desktop research and secondary data	Interviews with firms **(Research Instrument 5)**	Internal and external interface mechanisms **(Research Instrument 7)**	Narrative Report **(Research Instrument 7)**	
UNIVERSITIES	Desktop research and secondary data	University interviews (relevant to SSI) **(Research Instrument 3)**	A, B, C **(Research Instrument 7)**	Narrative report **(Research Instrument 7)**	
		University interviews (not relevant to SSI) **(Research Instrument 3)**	A, C **(Research Instrument 7)**		
TVET	Desktop research and secondary data	TVET interviews (relevant to SSI) **(Research Instrument 4)**	A, B, C **(Research Instrument 7)**	Narrative report **(Research Instrument 7)**	
		TVET interviews (not relevant to SSI) **(Research Instrument 4)**	A, C **(Research Instrument 7)**		
		Interviews in other types of colleges (e.g. agricultural colleges) **(Research Instrument 4)**	A, B, C **(Research Instrument 7)**	Narrative report **(Research Instrument 7)**	
INTERMEDIARIES	Desktop research and secondary data	Interviews with private intermediaries **(Research Instrument 6)**	Internal and external interface mechanisms **(Research Instrument 7)**	Narrative report **(Research Instrument 7)**	
		Interviews with public intermediaries **(Research Instrument 6)**	Internal and external interface mechanisms **(Research Instrument 7)**		

Step 1

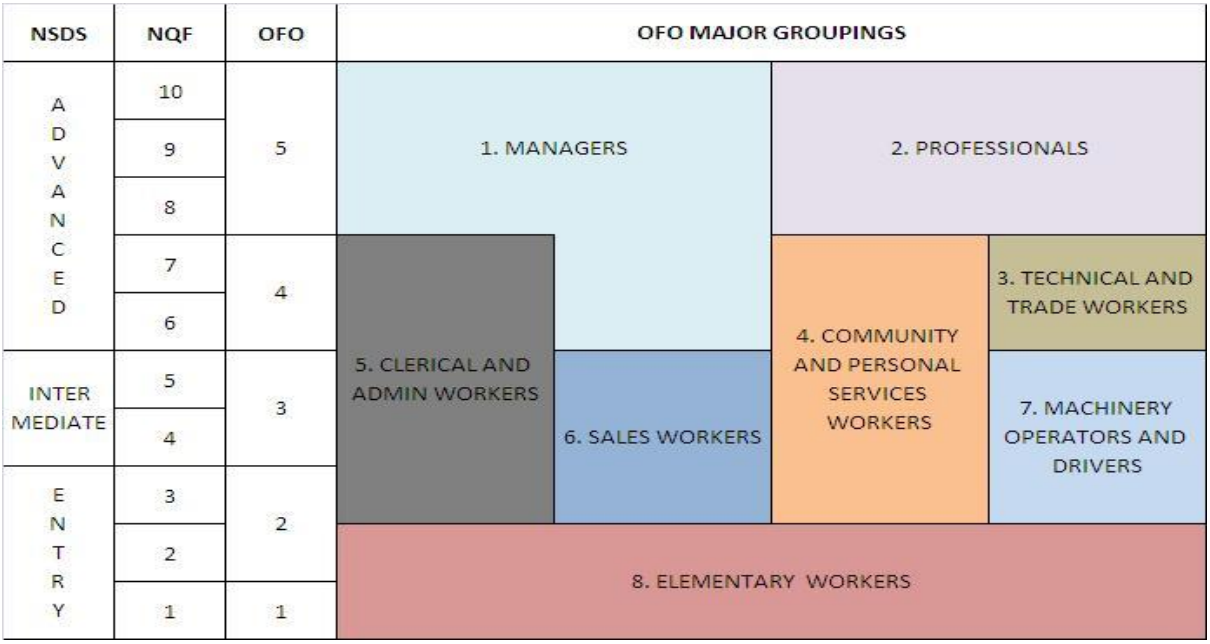
The *first step* of each case study will be to develop an initial map of the actors in the sectoral system of innovation to identify the structures of their interaction. The initial map of actors and networks will be elaborated and refined in the course of the fieldwork, as each interviewee reports on their interactions with other actors in the sectoral system. The specific education and training organisations, firms and intermediaries to be included in the interviews, in *Step 2*, should be identified from the initial mapping process.

Ideally, the map should form part of a sectoral overview or background paper identifying key occupational levels within firms, and the types of education and training organisations that provide qualifications for each of these. A template for conducting a sectoral background paper is included in a separate document, **Research Instrument 2**.

We suggest that you use the sectoral overview to decide on a segment(s) of the value chain that is of particular interest, in terms of contribution to employment or GDP for example. Since knowledge and technology fields and skills needs differ by sub-sector, it is necessary to select a specific set of focus knowledge and technology fields, programmes and qualifications relevant to the segment of the value chain selected.

We suggest occupational groupings and levels that are distinctive to the knowledge and technology base of the selected segments of the value chain be used to guide the selection of programmes and qualifications within universities and TVET colleges.

Figure 3 below illustrates the different occupational groupings and levels in South Africa. In Box 1, we provide an example of how to apply these principles, based on our research on the sugar sector.



Source: OFO Annual Update Summary 2013 (Presentation by FP&MSETA)

Figure 3 OFO major groupings

Box 1 Selection of focus fields, programmes and qualifications for the LMIP case study on the sugar sector

For example, in the LMIP research study, for the research on the sugar sector, we focused on the growers and millers, given that these two segments account for most of the employment. This means that we needed to focus on both primary agriculture-related qualifications, and milling-related qualifications (i.e. engineering and refining).

We excluded four 'Organising Framework for Occupations' (OFO) major groups from the fieldwork. Community and personal services workers (4) are not relevant to the sugar sector at all. Managers (1), clerical and admin (5) and sales workers (6) are generic occupational groups. Their education and training is not directly related to the sugar sector per se, except for qualifications in agricultural management.

We focused on four occupational groups, and the agricultural and engineering qualifications connected to these – professionals (2), technical and trade workers (3), machinery operators and drivers (7), and elementary workers (8). These provided a spread of skills levels that require qualifications provided by the range of post-school education and training organisations.

Using the SAQA list of registered qualifications, we identified an initial list of agricultural- and milling-related qualifications for each of these occupational groupings. This allowed us to identify specific programmes or departments within each type of education and training organisation, as the initial focus for the case study fieldwork.

Step 2

The *second step* of each case study will be to investigate the skills needs of firms and interactive capabilities of education and training organisations identified in the initial mapping.

As discussed in the conceptual framework, understanding the policy environment pertaining to the role of each type of actor in skills development is crucial. To understand government policy, one could rely on desktop research on relevant public policies or obtain an understanding of the current policy context via interviews with DHET branch managers and other cognate government departments.

The research in the firms and intermediaries will provide a preliminary understanding of skills development networks in the sector, and will thus inform the selection of education and training organisations to study in-depth.

The firm interviews and analysis should be informed by desktop work, using existing databases, internet and secondary sources, and sectoral background paper. The focus of the analysis is on the drivers of innovation and technology change in the sector, and the strategies that firms use to meet their skills needs, and skills constraints, across high, intermediate and basic levels of production.

The firm research should be complemented by interviews with SETAs, industry associations, and other intermediaries. We distinguish between those that act in the interest of public good, such as higher education associations, or college principals' organisations; and private sector intermediaries, such as industry bodies. The main aim is to understand their roles in linking demand and supply-side actors. The purpose of these interviews is to identify present and future skills needs, capacity and constraints in the sector, and the existence and effectiveness of mechanisms to facilitate interaction around skills development between firms and education and training organisations.

We focused our in-depth analysis on the interactive capabilities of each of the education and training organisations that provide qualifications and skills development for the core occupations in the sector. (We reiterate that it is also possible to focus on firms and intermediaries in the same way.) In what ways is there co-evolution so that education and training organisations are delivering the scale and kinds of qualifications and skills required in the sector? The focus is on identifying the competencies, interactive capabilities and dynamic interactive capabilities within education and training organisations in relation to three dimensions of their activity:

1. What they teach – the approach and mechanisms by means of which programmes are informed by technological drivers and skills needs in the sector (or not, as the case may be)
2. How they teach – the approach and mechanisms that shape work readiness of graduates, such as workplace learning, internships, apprenticeships or learnerships, in interaction with firms in the sector
3. How they facilitate labour market access – the approach and mechanisms that support individual's labour market transitions, in interaction with firms in the sector

In-depth semi-structured interviews are most suitable for gathering information on the competences, interactive capabilities and dynamic interactive capabilities. Within universities and TVET colleges, the Heads of institutional planning/college managers, Heads of external interface structures and mechanisms, and lecturers and trainers in relevant fields should be interviewed. The interviews should be complemented by desktop research including the consultation of websites, organisational policy documents and overview of structural arrangements.

To develop a systemic understanding of skills supply and demand, each type of education and training organisation identified as relevant for the SSI, whether public or private higher education or TVET, should be studied.

Step 3

The *third step* of the research is analytic, to reflect on the interactive capabilities and strategies of each of the different kinds of actors in terms of their roles and interaction within the SSI. A narrative report on each type of actor in the SSI could be prepared, based on an analysis of the semi-structured interviews and the analytical templates. The interview schedules are included in separate documents, **Research Instruments 3 to 6;** and the analytical templates are included in **Research Instrument 7**.

Step 4

An *optional, additional step* is to prepare a synthesis case study report. We suggest that this should be the task of a synthesiser/main author, who will analyse and synthesise the narrative reports

contributed by the researchers on each of the components: firm component, university component, TVET college component, private provider component, and intermediary component (see Table 3 above). The synthesis report could reflect on the ways in which universities and TVET colleges interact with firms, SETAs and other intermediaries to shape their core activities. This information would be useful for identifying appropriate **change** mechanisms, and specific areas where funding and interventions can most likely have leverage.

Section 3. References and further reading

This section provides a list of key readings, organised by subject area. We include a list of:

1) key documents on current policy concerns and challenges related to skills development and planning in South Africa
2) core literature on innovation systems and sectoral systems of innovation that inform our research framework,
3) core literature on network alignment and interactive capabilities,
4) useful literature on the methodology, and
5) research reports produced through the LMIP research project

Current skills policy concerns and challenges in South Africa

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