RESEARCHERS CHALLENGE

#OPENUPYOURTHINKING

*READY, SET, **THINK**!*

THEME 5:

Intersecting perspectives on transforming education for sustainable futures – Vocational Education & Training (VET) & Covid-19 in Southern Africa

Project lead: Presha Ramsarup

Date: 03 July 2020

UNESCO

SADC SOUTHERN AFRICAN DEVELOPMENT COMMUNITY TOWARDS A COMMON FUTURE

JET EDUCATION SERVICES
THINK EDUCATION. THINK JET.

TE|SF
Transforming Education for Sustainable Futures

Education 2030

Support for this project was provided by the Open Society Foundations. For more information about Open Society please go to: www.opensocietyfoundations.org.

Contents

List of Figures ..... *ii*

Acronyms and abbreviations ..... *ii*

1 Why focus on Vocational Education and Training (VET) for sustainable futures in the coronavirus disease 2019 (Covid-19) pandemic? 1

2 Research questions and approach 2

2.1 Research design 2

2.2 Some challenges and limitations 3

3 Literature review 4

3.1 Conceptualising Vocational Education and Training (VET) 4

3.2 Classification of TVET 4

3.3 Sustainable livelihoods, green and decent work 5

3.4 Thinking about knowledge and expertise 7

4 An overview of TVET in the respective research countries, with particular reference to policy, greening and the impact of Covid-19 8

4.1 An overview of the TVET sector in SADC by researcher country 8

4.1.1 An overview of TVET in Botswana 8

4.1.2 An overview of TVET in Eswatini 9

4.1.3 An overview of TVET in Mozambique 9

4.1.4 An overview of TVET in South Africa 9

4.1.5 An overview of TVET in Zambia 10

4.1.6 An overview of TVET in Zimbabwe 10

4.2 The greening of TVET and community education: Selected SADC country insights 11

4.2.1 Greening TVET and community education in Botswana 11

4.2.2 Greening of TVET in Eswatini 12

4.2.3 Greening TVET and community education in Mozambique 12

4.2.4 Greening TVET in South Africa 13

4.2.5 Greening TVET and community education in Zimbabwe 13

4.2.6 Greening TVET and community education in Zambia 14

4.3 The impact of Covid-19 on TVET: Selected SADC country insights 15

4.3.1 Botswana 15

4.3.2 Eswatini 16

4.3.3 Mozambique 17

4.3.4 South Africa 18

4.3.5 Zambia 18

4.3.6 Zimbabwe 19

5 Learning from livelihood stories 20

5.1 Livelihoods and associated sustainable, green and decent work interventions 20

5.2 Tasks, skills, knowledge and expertise identified 22
6 Recommendations for Building back better – Lessons for VET: Learnings from Covid-19 26
References 29
Appendix: Research team 37

List of Figures

Figure 1: The research design process 2
Figure 2: An overview of a generic education system showing how the vocational education and training fits into the OECD's ISCED classification 5
Figure 3: Illustration of case study examples where the relationship between tasks, skills and knowledge is shown 23

Acronyms and abbreviations

ANAC	National Administration for Conservation Areas
ANEP	National Professional Education Authority
BOTA	Botswana Training Authority
CCFAS	climate change, agriculture and food security
CET	continuing education and training
Covid-19	Coronavirus disease 2019
CPD	continuous professional development
DEA	Department of Environmental Affairs
DHET	Department of Higher Education and Training
DNTF	National Directorate of Land and Forests
DVET / DTVET	Department of Vocational Education and Training
ECD	early childhood development
ETSSP	Education and Training Sector Strategic Plan
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
ICT	information and communications technology
ILO	International Labour Organization
IPAP	Industrial Policy Action Plan
ISCED	International Standard Classification of Education
IT	information technology
MLHA	Ministry of Labour and Home Affairs
MoESD	Ministry of Education and Skills Development
MoET	Ministry of Education and Training
MSE	micro and small enterprises
MSTVT	Ministry of Science, Technology and Vocational Training
MTSF	medium term strategic framework
NC(V)	National Certificate (Vocational)
NDP11	National Development Plan 11
NFE	non-formal education
NGO	non-governmental organisation
NIPF	National Industrial Policy Framework
NPVET	National Policy on Vocational Education and Training
NQF	national qualifications framework

NSDS	National Skills Development Strategy
OECD	Organization for Economic Co-operation and Development
PESTLE	political, economic, social, technological, legal and environmental
PPE	personal protective equipment
PSC	Public Service Commission
SADC	Southern African Development Community
SDG	Sustainable Development Goal
SWTS	school-to work transition survey
TEC	Tertiary Education Council
TEVET	Technical Education, Vocational and Entrepreneurship Training
TEVETA	Technical Education, Vocational and Entrepreneurship Training Authority
TVET	technical and vocational education and training
TVETSD	Technical and Vocational Education and Training and Skills Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	UNESCO's International Centre for Technical and Vocational Education and Training
VET	Vocational education and training
WHO	World Health Organization

1 Why focus on Vocational Education and Training (VET) for sustainable futures in the coronavirus disease 2019 (Covid-19) pandemic?

Documenting how skills that support sustainable and green livelihoods have dominated the response to the coronavirus disease 2019 (Covid-19) pandemic is key to strengthening Vocational Education and Training (VET), a marginalised educational and training system in the Southern African Development Community (SADC) region. VET has immense transformative potential. According to the 2016-2021 UNESCO strategic plan for TVET (UNESCO, 2016), VET is a crucial vehicle for social equity, inclusion, Sustainable Development Goal (SDG) Goal 4 and the Education for Action 2030 Framework (UNESCO, 2015). SADC views VET as key towards achieving short-, medium- and long-term industrialisation strategic goals in the region. However, with the closure of educational institutions during lockdown, and the call for enhanced online learning and alternative learning models, there is a real risk of failure for VET systems.

In our research, we have considered not only the Covid-19 pandemic, but also climate change and other global change issues and their intersections. António Guterres, Secretary-General of the United Nations stated: "As the world begins planning for a post-pandemic recovery, governments must seize the opportunity to 'build back better' by creating more sustainable, resilient and inclusive societies" (UN, 2020). 'Build back better' involves turning recovery into an opportunity to do things correctly for the future. It is a strategy for dealing with global change that requires transformative action and just transitioning practices. This study aims to contribute to 'building back better' via VET research and praxis that builds local economies and the commons as a just transitioning practice. Some skills have been needed to reinforce responses to Covid-19 – with technical and vocational education and training (TVET) colleges and non-governmental organisations (NGOs) having utilised skills learned from sewing face masks, producing hand sanitisers, welding hand wash stations or making face shields.

We acknowledge the work of Powell and McGrath (2019) who argue, at empirical level, that when researchers talk about a particular institutional form they use the term TVET. However, this study uses the concept of VET to adopt a broader perspective used by Spours (2020) that looks at VET as connecting living–working–learning. Although there are many definitions of VET, centrally VET refers to 'education and training which aims to equip people with knowledge, know-how, skills and/or competences required in particular occupations or more broadly in the labour market' (Cedefop, 2008 p. 203). In this sense, VET is sometimes referred to as an adaptive layer between education and the economy. As the field of education and the economy are in constant flux, the VET system must reposition and reinvent to remain effective as a bridge between them (Powell & McGrath 2019).

Using local case studies and desktop research, the study investigates the links between emergent livelihoods, decent work and skills development. Important findings show that TVET recovery responses require clear direction beyond recovery rhetoric, but there is little focus on deep systemic transformation. The pandemic provided a platform for the re-emergence of the green economy / circular economy opportunities with a focus on local economies and local products and waste. Links between VET institutions and livelihoods in communities need to be explored so an understanding of entry level transitions into the formal VET sector becomes clear.

This study involved nine researchers who represented six countries in the SADC region: Botswana, Eswatini, Mozambique, South Africa, Zambia and Zimbabwe. The research is presented in two main sections:

1. An overview of TVET in the respective countries, with particular reference to policy, greening and the impact of Covid-19.
2. Insights and learnings from the country case studies on sustainable livelihoods, green and decent work, and skills, knowledge and expertise in response to the Covid-19 pandemic.

2 Research questions and approach

This section provides an overview of our research methodology and approach. The study was a co-constructed programme which involved all the researchers in co-defining the research questions, and undertaking systemic investigations related to key questions. The challenge was set within the context of the Covid-19 pandemic and consequent lockdown. It involved 12 researchers in six countries of the Southern African Development Community (SADC) region.

To encompass the varied interests of researchers from a broad range of backgrounds, none of which was education, the study centred around the following question:

What are the meanings and manifestations of sustainable livelihoods and decent work that have emerged in local communities during the Covid-19 crisis, and what are the implications for learning and intermediate skills development?

The research was structured around sustainable livelihoods as this was the common interest point for the researchers. The research leads then structured the research process to draw out the knowledge and skills processes within the case studies.

2.1 Research design

The research used small-scale case studies of sustainable enterprises that the researchers located within their local communities. They explored practical examples from their respective countries (and focused on livelihoods as well as decent work linked to VET) that had emerged during the Covid-19 debates. From the livelihood cases collected and studies the researchers worked with, the following questions used to analyse their case studies emerged:

1. What are the lessons around green and decent work and VET?
2. What are the lessons around just transitioning?
3. What are the lessons around knowledge, learning and pathways that can contribute to a more sustainable and just VET sector?

Figure 1 shows the research design process. The researchers worked with their local contexts. They selected a local case and were assisted with studying the case in its local and broader context. The researchers were provided with different analytical lenses to study across the cases.

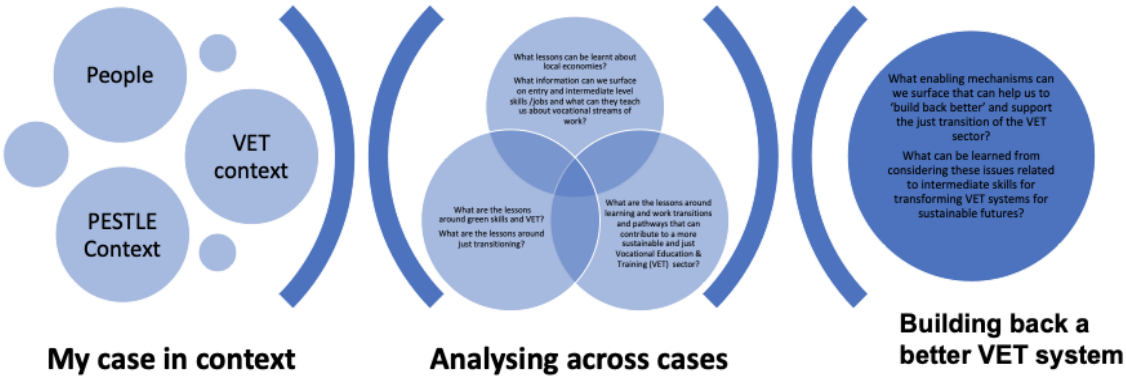


Figure 1: The research design process

2.2 Some challenges and limitations

The research was undertaken in unusual circumstances, during a rapidly emerging and changing pandemic situation affecting the lives of children, parents, communities, teachers and governments differently over the time of the research. The researchers involved were in their respective countries working remotely weekly. All meetings that took place to put together this report and the case studies were virtual. There were great limitations placed on the researchers due to the inability to work in a normal, no-lockdown situation. It is through this narrative that we engage with the context of TVET and how Covid-19 has impacted on this sector globally and within the region.

The research was undertaken across country borders with 12 young researchers in a short time frame of one month. No interpersonal interaction was possible from a fieldwork point of view. All of the research was undertaken online. This created both possibilities as well as limitations for the study and its execution.

3 Literature review

Vocational Education and Training 'traverses the education–work border' (McGrath, 2011, p. 36), is about intermediate skills necessary to maintain livelihoods in Southern Africa (McGrath, 2005) and is critical to a nation's socio-economic context (Akoojee & McGrath, 2004). This link between education and work, intermediate skills and livelihoods is what the #Theme5 is about.

3.1 Conceptualising Vocational Education and Training (VET)

In our research, we recognise that there are many definitions of VET but centrally "consider VET to be the development and application of knowledge and skills for middle level occupations needed by society from time to time" (Moodie, 2002). King (2020) explains that VET has had a very special history, making it rather different from other education sectors such as secondary or higher. Because of its close connections with employment and the world of work, there have been more politics around VET priorities and approaches than with education more generally.

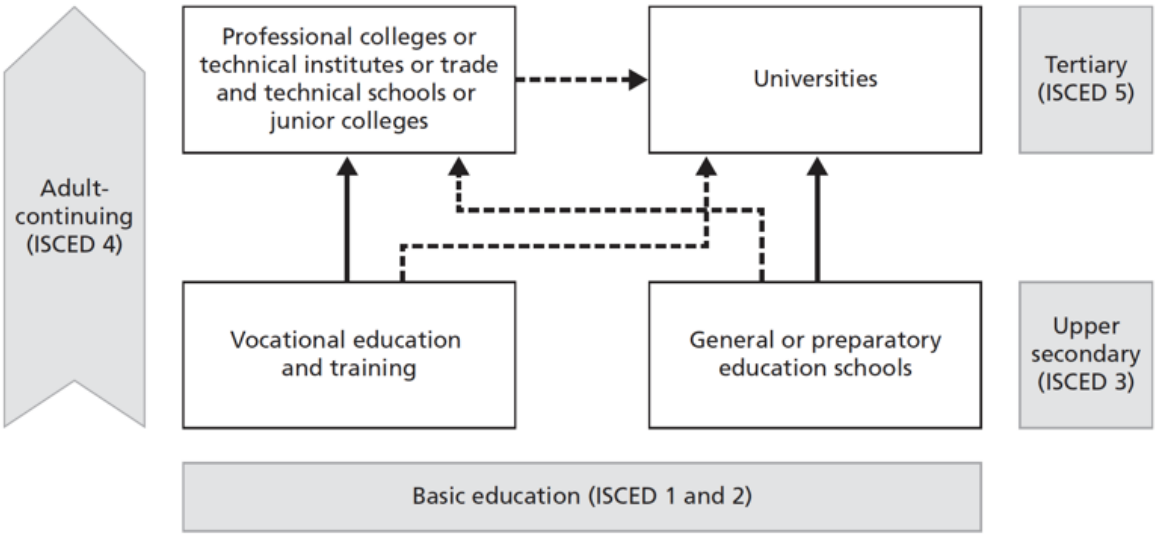
Most recent studies by Spours (2018, 2020) argue for VET to be conceptualised and developed as connecting living–working–learning. Similarly, Powell and McGrath (2019) argue that in talking about skills for work and life, UNESCO has focused on three lenses for thinking about VET: economic productivity and growth, equity, and environmental sustainability. These link VET to decent work and sustainable production and consumption which are ideas that frame this small-scale research study. King (2020) also argues that a crucially important methodological dimension of VET, the link between VET and non-formal education (NFE), is essential in exploring the transformative potential of VET. NFE emerged in 1969 as a term that covers a range of organised learning and training activities that take place outside the traditional confines of formal primary, secondary and tertiary education (King, 2020, p. 318).

The benefits of VET are emphasised by Kemevor and Kassah (2015) and include the ability of VET to differentiate training needs of students in preparation for meaningful employment and sustainable livelihoods. This may be attributed to the character of the VET curriculum which emphasises the acquisition of skills and ensures there is articulation of VET programmes in the world of work. Eicker, Haseloff and Lennartz (2017) posit that VET enables individuals to assume essential and meaningful activities in their local communities, which, therefore, empowers them and provides security to improve their livelihoods. Kirui and Kozicka (2018) further emphasise the advantage of VET for strategic knowledge building about good governance, rural organisations and the informal sector.

3.2 Classification of TVET

The acquisition of knowledge and skills for the world of work is what Technical and Vocational Education and Training (TVET) is about and concerned with (Hollander & Mar, 2009; McGrath & Lugg, 2012; McGrath et al., 2019). From an international policy and practice perspective, the TVET system is diverse and uneven.

According to the Organization for Economic Co-operation and Development (OECD), the International Standard Classification of Education (ISCED) helps in organising international programmes following a set of rules. In terms of classifying TVET, "programmes classified at ISCED level 3 may be referred to in many ways, for example: secondary school (stage two / upper grades), senior secondary school or (senior) high school. For international comparability purposes, the term 'upper secondary education' is used to label ISCED level 3" (OECD, 2011, p. 47). The two programme orientations at ISCED level 3 are general and vocational (OECD, 2011, p. 49). Presented along the logic of the ISCED classification by the OECD, Hollander and Mar (2009) offer an overview of the TVET systems internationally, urging for a somewhat different set of institutions and requirements across different countries. See Figure 2 below.



Source: Hollander and Mar (2009, p. 40)

Figure 2: An overview of a generic education system showing how the vocational education and training fits into the OECD's ISCED classification

Across the world, local economies are facing significant challenges. They are crucial for people's livelihoods, well-being and for building a more just economy. If the vocational education and training system 'built back better', it could provide more equitable jobs, decent work, enhanced entrepreneurial activities, new options for pathways into work and enhanced wellbeing. This transition would involve deep-seated structural changes across many societal subsystems – especially in the vocational education system – and would also involve cultural change in terms of greater inclusivity and social justice.

This is particularly the case and of relevance to the SADC region. The informal economy in sub-Saharan Africa represents 66% of total economic activity and "informal employment is the standard condition among most youth in Sub-Saharan Africa where at least eight in ten young workers in all eight school-to work transition survey (SWTS) countries fall into the category of informal employment" (ILO, 2015).

3.3 Sustainable livelihoods, green and decent work

There is a link between environmental sustainability, decent work, livelihoods and social justice according to the International Labour Organization (ILO). Elaborating on this, "global and local environmental degradation threaten jobs and worsen working conditions, especially in developing countries and among women and the world's most vulnerable people (including migrant workers, people in poverty and indigenous and tribal peoples), making environmental sustainability an issue of social justice" (ILO, 2018, p. 7). The need for a sustainable ecosystem embedded within a green economy in which livelihoods are sustainable through decent work with less pollution and a reduced carbon footprint is at the heart of this study. The place of TVET in linking the skills acquisition with the world of work makes its role pivotal in ensuring that economic growth is not taken for granted without thinking of the impact it has on the environment, including climate change. There can be no true development without engaging with the long-term effect it has on the environment. The notion of "development in a context of environmental sustainability means transitioning towards a green economy, that is, an economy in which the capacity to satisfy tomorrow's needs is not limited by today's resource use, emissions and waste" (ILO, 2018, p. 38).

Central to a discussion of livelihoods is the notion of vulnerability. Thus, understanding vulnerability during this turbulent time is essential. Within this research, Serrat's 2017 characterisation of vulnerability as insecurity in the well-being of individuals, households and communities in the face of changes in their external environment remains useful. He further explains that vulnerability has two facets: An external side of shocks, seasonalities and critical trends and an internal side of defenselessness caused by lack of ability and means to cope with these (Serrat, 2017).

This research has used a community-focused approach to livelihoods to explore how communities lived, learnt and worked during the crisis. Amartya Sen argues that "a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks, and provide sustainable livelihood opportunities for the next generation, and which contributes net benefits to other livelihoods at the local and global levels and in the short and the long term" (Oxfam, 2013, p. 6).

A number of studies conducted on VET in Africa (Eicker, Haseloff, & Lennartz, 2017; Kathure & Mbijjiwe, 2014; Kirui & Kozicka, 2018) are in concordance that the informal sector provides a rich and untapped portal for the implementation of skills development projects. Kathure and Mbijjiwe (2014) report that small skills development projects provide successful training for literacy and livelihoods in Kenya.

These small projects can be expanded to a larger scale, like the Kenya Jua-Kali Project, where basic technical skills are provided through traditional apprenticeship in the informal sector. Jua-Kali are government empowerment programmes providing capacity building and training for micro and small enterprises (MSE) and entrepreneurs, including promoting their products and providing entrepreneurship training (Njua, Mulwa, Kyalo, & Mbugua, 2019). Working partnerships between local communities and NGOs are pivotal to the uptake and adoption of these training programmes.

Kirui and Kozicka (2018) make a direct link between the quality of skills and student competencies for improving productivity and reducing poverty in sub-Saharan Africa. Productivity stimulates income growth in the informal sector for women, men and youth, which, in turn, increases their human capital and skills – the prospects of finding decent work in the formal sector are, therefore, increased (Kirui & Kozicka, 2018). Furthermore, Eicker, Haseloff and Lennartz (2017) conclude that in the informal sector workers are often their own employers and there is thus a sense of personal empowerment amongst individuals. In Ethiopia, it was observed that this individual empowerment provides a currency for women, youth and workers to bargain with employers, and is a means for sustainable living and to earn livelihoods (Eicker, Haseloff & Lennartz, 2017).

Environmental degradation as well as social inequality are central issues within this imperative. When investigating livelihoods, the nexus between poverty and the environment has notable implications for applied research, policy and development practice. Hence this research draws on a green and decent framing of work.

Decent work is a concept meant to abolish inequalities in the work sector and to reduce corruption practices. Singh and Bhatnagar (2014) stipulate that the term decent work was coined and published in a report by the International Labour Organization (ILO) in June 1999 to give a clear description of its goal, which includes acceptable job quality for all people not just the creation of jobs. In the same vein, decent work discourses note that the level of employment or quantity cannot be detached from job qualities, which are conditions of work, a feeling of value and satisfaction in the workplace.

ILO states that decent work lies at the heart of social progress. In addition, the aspirations of the people and their hope for the future are summed up by decent work. It delivers a fair income, security in the workplace, social protection for people, better prospects for personal development, social integration, freedom for people to express their concerns, organise and participate in the decisions that affect their lives as well as equality of opportunity – including treatment for all women and men (European Foundation for the Improvement of Living and Working Conditions, 2018).

Green and decent work can be enhanced by promoting the greening of enterprises, the labour market as a whole and by introducing work-related practices at the place of work (ILO, 2013). This small effort can help create decent job opportunities, enhance resource efficiency more and build low carbon sustainable societies which may help restore the natural environment.

According to ILO (2013), poverty reduction in this era may be achieved through green and decent work. This may result in equitable, inclusive and sustainable development for all. The 10 substantive elements of decent work indicators are: Employment opportunities, adequate earnings and productive work, decent working time, combining work, family and personal life, work that should be abolished, stability and security of work, equal opportunity and treatment in employment, safe work environment, social security and social dialogue including employers and workers representation. These indicators are earmarked to monitor, evaluate and analyse the decency of jobs in a holistic manner.

3.4 Thinking about knowledge and expertise

While the debates on knowledge generation appear fragmented (Guile, 2010), two distinctions are commonly recognised (Hessels & Van Lente, 2010): The first is often referred to as Mode 1 – a more traditional (codified) manner and the second as Mode 2 – learning through doing (tacit) (Witt & Zellner, 2007). In *The New Production of Knowledge: The Dynamics of Science and Research In Contemporary Societies*, Gibbons et al. (1994) formally distinguish the two disciplines of knowledge production in the context of suggesting a shift of dominance from codified to tacit (Mode 2).

With an increased interest in tacit knowledge, the role of individuals and their competencies and capabilities to share and absorb knowledge became increasingly valued in an environment that was fast-paced and required flexibility to respond to a changing and competitive market (Gamble, 2004).

To distinguish more clearly between codified and tacit knowledge, Johnson et al. (2002, p. 249) presents four types of knowledge: "Know-why", "know-what", "know-how" and "know-who". Know-why is the understanding of the principles and laws underlying phenomena and functions through the process of study (Garud, 1997). Know-why is mostly codified, but can also be generated from individual skills (Johnson et al., 2002).

Know-what is created through interaction and feedback between knowledge generators and users (Garud, 1997) or, as defined by Johnson et al. (2002), it is known as the "facts" (which can be codified). Know-how is generated through the process of doing and learning how to perform an activity over time (Garud, 1997) by drawing on skills, knowledge and experience (Johnson et al., 2002; Polanyi, 1962).

It has been argued that vocational and professional knowledge, of which vocational is of interest here, is predominantly concerned with the generation of practical knowledge (aka know-how), with individuals developing their competence over time as their knowledge and level of skill develops (Winch, 2010).

While these types of knowledge have been widely discussed and examined, with various categorisations applied, they have tended to be within the domain of vocational curriculum (Heusdens et al., 2018). As such, the same level of discourse is not necessarily found with regard to how individuals access the different types of vocational knowledge.

Drawing on the work of Barbour et al. 2016, Guile and Unwin (2019 p 31) argue that expertise or the "application of knowing to solve problems" involves a combination of the following dimensions of expertise :

1. Technical (specific knowledge required to perform).
2. Arcane (rules, history—as in a "community of practice").
3. Interpersonal (relational aspects of practice).
4. Embodied (physical conduct of work and the space in which it takes place).

Expertise, then, is used as an overarching term to conceptualise the relationship between work and VET. The concept of expertise embodies both the practical and theoretical components involved in the performance of work of all kinds. This universality enables us to examine how expertise is conceived and developed across occupational boundaries and national systems.

This taxonomy bridges what is often presented as a divide between 'explicit' and 'tacit' forms of knowledge. The institutional conception of VET tends to focus on the technical, with some attention to the arcane, and to separate the interpersonal from practice, as in so-called generic or soft skills. Attention to the embodied aspect of expertise may be given, although not necessarily articulated, and may be encompassed by a more generalised notion that there is a tacit realm to any area of expertise (as when trainee carpenters are encouraged to keep running their hands along a piece of wood, or when chefs are encouraged to 'feel' the moment a sauce starts to thicken) (Guile and Unwin , 2019 p. 31).

This report and the case study research undertaken during this research project, therefore, provide a window into this area of research.

4 An overview of TVET in the respective research countries, with particular reference to policy, greening and the impact of Covid-19

4.1 An overview of the TVET sector in SADC by researcher country

The UNESCO (2013) report, *Status of the TVET in the SADC region* states "TVET policy frameworks across the SADC region mostly reside under broader government strategies for skills development in service of poverty alleviation, employment and employability, economic upliftment and competitive market engagement" (p. 38).

A comparative overview of current policy trends and concerns across UNESCO's International Centre for Technical and Vocational Education and Training (UNEVOC) SADC-specific country reports (2014–18) identify and present findings on only two sub-Saharan African countries (Mozambique and South Africa) in their global report.

The trends in Mozambique focused on equity, quality of teachers, quality assurance, links with industry, national qualification, decentralisation, governance and financing as key current policy trends and concerns (ILO-UNESCO, 2018, pp. 21-22). For South Africa, equity, quality of teachers, facilities and infrastructure and financing were identified as key current policy trends and concerns (ILO-UNESCO, 2018, pp. 22-23).

Across the entire region, "policy makers are aware of the critical role that TVET can play in national development and, while they regard TVET as an engine for sustainable development, they find it challenging to formulate policies and strategies to deal with the complex issues in this sub-sector" (SADC, 2011, p. 4).

With the awareness of the importance of TVET to national development and its important link between education and work (McGrath, 2012; McGrath et al., 2019), the report argues that "TVET reforms across the SADC region are driven by a strong concern to ensure that training is responsive to, and relevant for, labour market and industry needs" (SADC, 2011, p. 5).

This overview has identified the importance of the TVET sector to the region's development and the labour market. Below, insights on TVET per the six countries represented in this study are presented as context for this study.

4.1.1 An overview of TVET in Botswana

The TVET sector in Botswana is considered an integral component of the country's National Development Plan 11 (NDP11) and skills development programme, with TVET college number having increased from 6,096 in 2008 to 11,406 in 2015 (Republic of Botswana, 2017, p. 103). This emphasis is of particular importance given that Botswana's population is young, with the country's median population age being 24 years (2015) (UNESCO, 2013, p. 5).

While TVET is considered a pivotal component of the country's skills development, it does need to be revitalised. As such, the Technical and Vocational Education and Training (TVET) Policy Framework was developed in recognition of the sector being integral to the nation's development of the Education and Training Sector Strategic Plan (ETSSP 2015-2020) (Republic of Botswana, 2017, p. 104).

As such, the "re-tooling of TVET and tertiary education programmes and institutions will enhance skills development." (Republic of Botswana, 2017, p. 129). The broader policy framework upon which the TVET sector policy is grounded is the 1997 National Policy on Vocational Education and Training (NPVET).

Two institutions supervise VET in the country: The Ministry of Education and Skills Development (MoESD) and the Ministry of Labour and Home Affairs (MLHA). Currently, Botswana's TVET legislation hinges on the Vocational Training Act (2000) which led to the formation of the Tertiary Education Council (TEC) which was founded on the establishment of the Botswana Training Authority (BOTA), and The Tertiary Education Act. (UNESCO, 2013). According to UNESCO, the "Department of Vocational Education and Training (DVET), which became the DTVET after the inclusion of Training, was created under the Ministry of Education and Skills Development, in order to augment what was being enforced by both acts" (UNESCO, 2013, p. 6).

4.1.2 An overview of TVET in Eswatini

Eswatini (formerly Swaziland) is the least populated nation in the SADC region, with about 1.1 million people and a median population age of 20.5 years (2015) (UNESCO-UNEVOC, 2012). According to the World Bank (2014), the country has 70 TVET institutions, of which 27 are public, 29 are private and 14 are run by NGOs, churches and communities. In total, they offer 415 training programmes in 60 fields of study, ranging from vocational programmes such as sewing and carpentry to highly technical and professional programmes such as business management and computer programming. Most of the courses offered are less than 12 months in duration. Almost 770 lecturers teach 6 881 students. The student success rate is 80 percent (ibid, p. ix).

The Ministry of Education and Training (MoET) has the overall responsibility for the TVET sector. This responsibility is premised on skills development and the development of the right policies and strategies to achieve this. Currently, the national policy documents guiding the TVET sector are: The National Technical and Vocational Education and Training and Skills Development (TVETSD) Policy and Strategy (2010), Education Sector Strategic Plan 2010–2022 (2010) and The Swaziland Education and Training Sector Policy (2011) (UNESCO-UNEVOC, 2012; World Bank, 2014).

A key challenge that Eswatini has is a lack of a national qualifications framework (NQF) (World Bank, 2014). This has impacted on the nation's ability to align with current policies in the SADC region and the country's national priorities (World Bank, 2014). Other critical challenges in relation to the TVET are low coverage with the unmet needs of approximately 14 000 individuals annually, lack of information systems to provide guidance to providers, students, employers, inefficiencies in terms of the significant variation in the institutional size and trainee-trainer ratio, quality assurance and sustainability (UNESCO-UNEVOC, 2012; World Bank, 2014, pp. 12-13).

4.1.3 An overview of TVET in Mozambique

Mozambique is the only Portuguese-speaking nation in the SADC region, with a population close to 30 million and a median population age of 17 years (2015) (UNESCO-UNEVOC, 2015). While the TVET sector in Mozambique comprises different public and private providers and offers formal, non-formal or informal training (World Bank, 2004), it is considered to be of poor quality with limited availability (World Bank, 2015). Thus, a significant number of practices need attention to improve the TVET sector and provision of education (ILO-UNESCO, 2018, pp. 21-22).

The country acknowledges the need to improve the quality of the TVET system, which is recognised in the Professional Technical Education Strategy (2002-2011). Based on this national intention, the country acknowledges the TVET sector as a necessary requirement to meet labour market needs and contribute to the nation's development (UNESCO-UNEVOC, 2015). Based on this, two key legislations regulating qualifications and setting objectives to meet the needs of the youth population were implemented. These are the Vocational Education Law (2014), which established the National Professional Education Authority (ANEP), and Law 6/92 (1992) (UNESCO-UNEVOC, 2015). The latter is the backbone of the provision of the TVET system within the Mozambican education system.

4.1.4 An overview of TVET in South Africa

South Africa is known to have serious social and economic challenges in terms of poverty, inequality and high rates of unemployment. It has been reported that 2.8 million of 18-24 year olds in the country are classified as "not in education, employment or training" (DHET, 2012). The youth in South Africa are increasingly without work, and there is no certainty of employment even after gaining a qualification. Therefore, faced by the challenges of unemployment and scarcity of skills, the South African government places significant value on skills development through the TVET system.

The TVET sector in South Africa is the most developed in the SADC region. There is an abundance of data, research publications and sustained investment in the sector by the South African government. South Africa's TVET strategy is administered by the Department of Higher Education and Training (DHET), and is founded on national imperatives namely, the Medium Term Strategic Framework (MTSF), the National Industrial Policy Framework (NIPF), the Industrial Policy Action Plans (IPAP), and the National Skills Development Strategy (NSDS III). In addition, key TVET legislation is entrenched in the South African Constitution (1996), with Section 29

emphasising the right of every South African citizen to education including basic, adult basic and further education. In alignment with the country's national imperatives, the Continuing Education and Training (CET) Act (Act No. 16 of 2016), as amended, provides regulations for the establishment, funding and directives for the governance of TVET colleges in South Africa.

The National Qualifications Framework (NQF) Act (Act No. 67 of 2008), as amended, provides the overarching policy framework for qualifications in South Africa. It is subdivided into 10 levels, with three sub-frameworks providing for general, academic and occupational pathways. TVET qualifications and part-qualifications are covered under the General and Further Education and Training sub-framework, the Trades and Occupational qualifications sub-framework and the Higher Education and Training sub-framework.

4.1.5 An overview of TVET in Zambia

Zambia is the third most populated nation of the six countries in this study, with a median population age of 17 years (2015). Zambia's traditional TVET system comprises "a network of centrally funded and managed institutions, primarily taking sixteen to eighteen-year olds straight from school into full-time (often boarding) vocational courses of one to three years" (World Bank, 2011, p. vii). Zambia has 23 public sector training institutions (technical colleges are offering programmes of up to three years, and trades training institutes offering programmes of up to two years) affiliated with the Ministry of Science, Technology and Vocational Training (MSTVT). In addition, other ministries also have training centres offering shorter Technical Education, Vocational and Entrepreneurship Training (TEVET) courses. Most TEVETs in Zambia are provided by NGOs, and there are more than 200 registered TEVET institutions (World Bank, n.d.).

Although the Education Act (1966) guides Zambia's education system (UNESCO-UNEVOC, 2010), three policy frameworks: TEVET Policy, 1996, Vision 2030, and the 5th National Development Plan, 2011-2015 guide the TVET system. The Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) is mandated to manage the country's TVETs. The legislation that empowers the institution to function in this role is the Technical Education, Vocational and Entrepreneurship Training (Amendment) Act No. 11 (2005). Under this legislation, "the Act provides for the establishment of government-run TVET institutions and outlines their management structure, as well as a regulatory framework for all TVET providers" (UNESCO-UNEVOC, 2010, p. 7).

As of March 2020, there were 295 TVET institutions operating in Zambia (TEVETA, 2020). According to TEVETA's Annual Report, in 2017 a significant number of registered TVET institutions were in four provinces along Copperbelt, Central, Lusaka and Southern – they accounted for 81.3% of the total number of registered institutions (TEVETA, 2017).

4.1.6 An overview of TVET in Zimbabwe

Zimbabwe has experienced extreme socio-economic challenges in recent times, and vocational education and employment are critical interventions for economic renewal, particularly for its youth, given the median population age of 19 years (2015). Zimbabwe has a total of 13 polytechnics and 43 vocational training centres (Ziwira 2020a).

The TVET system in Zimbabwe is plagued by different challenges, and data on the system is not readily available (Oketch, 2009). The main legislation guiding TVET in Zimbabwe is the Education Act No. 5/1987, amended in 1991 and 2004. The Manpower Planning and Development Act: 28:02 of 1984 (amended in 1996) regulates the operations of the TVET colleges, including the different institutions involved in the sector.

Some of the characteristics of the Zimbabwean TVET system are: 1) the dominant model of training in Zimbabwe's TVETs is a competence-based education and training approach (Muwaniki & Wedekind, 2019), 2) 12% of what is taught at secondary school level has vocational content (Oketch, 2009) and 3) government absorbs most of the VET teachers into the labour market through the Public Service Commission (PSC) (Muwaniki & Wedekind, 2019). While the government may absorb many of the teachers, it is claimed that the professional development of VET teachers is currently in disrepair (Muwaniki & Wedekind, 2019).

4.2 The greening of TVET and community education: Selected SADC country insights

The importance of greening TVET is both a global (UNESCO-UNEVOC, 2017a) and a regional (UNESCO-UNEVOC, 2013, 2017b) priority. At global level, the 'Greening Technical and Vocational Education and Training (TVET)' report argues for the role of TVET in achieving a transition to a low-carbon economy and climate-resident society (UNESCO-UNEVOC, 2017b, p. 17). Within these 'traditional roles', the report states three new expectations TVET faces:

1. TVET for educating and training individuals to transition to a sustainable society,
2. Making TVET input current and relevant for ongoing labour market regulations, and
3. Instilling consciousness, motivation to develop a green culture (UNESCO-UNEVOC, 2017b, pp. 17-18).

Contextualised within the global perspective, TVET lecturers and managers agree with the need to achieve the Sustainable Development Goals and integrate the notion of sustainability into the TVET curriculum in the region (UNESCO-UNEVOC, 2017a). This broad global commitment is explored within the regional context below.

Within this context, greening is understood as the process of pursuing knowledge and practices with the intention of becoming more environmentally friendly, enhancing decision-making and lifestyle in more ecologically responsible manner that can lead to environmental protection and sustainability of natural resources for current and future generations (Luken, Clarence-Smith, Langlois, & Jung, 2019).

Green skills are understood as knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society (Cabral & Dhar, 2019). Greening is an emerging and ongoing concept that has an infinite timeframe for all tertiary institutions, including TVET colleges.

To explore progress within the SADC region, the discussion below draws on two key strands to examine the greening of VET:

1. The current emergence of environmental programmes within the TVET sector in some SADC countries.
2. The expanded role of NGOs in supporting the green transition within society and community education.

As such, this section discusses some of the examples identified by researchers on the emergence of green programmes within VET institutions, and the role of community or NGO vocational programmes. The discussion highlights cases from Botswana, Mozambique, South Africa and Zimbabwe.

4.2.1 Greening TVET and community education in Botswana

In Botswana, the review of the list of accredited TVET learning programmes ranging from certificate level and below (BQA, 2018) show a limited number of environmentally-related programmes. The majority range from business courses to engineering courses, as well as beauty, culinary, and health-related majors.

There is no evidence of greening within these programmes. A few of the available environmentally-related majors include, but are not limited to, health and environmental science, food safety and hygiene management, livestock farming, oil management and contamination control.

Batlegang (2012) notes that those enrolled in information technology (IT) courses at TVET colleges in Botswana are encouraged to adopt greener approaches when using technology and associated devices. His research confirms that an elevated level of awareness could lead to behavioural changes and welcome greener uses of IT in these learning institutions.

According to Calleja and Prizzon (2019), NGOs in Botswana have limited presence in issues affecting the country such as environmental and climate change policies given the urgency and magnitude of the matter in recent times. With this recognition, the government of Botswana sees the need to engage the private sector as a vital ally in promoting skills development and technical transfer. Even though there is no specific mention of transferred green skills in the report, it is evident that the government has worked with and engaged the private sector to help cultivate the skills and capacities needed to develop its domestic industry.

According to UNEVOC, greening or adapting to more environmentally friendly ways in TVET will not only benefit the institution but the whole community, as it contributes to the evolution of a sustainable and green future for the country.

4.2.2 Greening of TVET in Eswatini

Eswatini Strategic Road Map (2019 - 2022) has identified five sectors of the economy (education and ICT, mining and energy, agriculture, manufacturing and agro-processing and tourism) that can potentially deliver a high impact on gross domestic product (GDP) growth, job creation and revenue mobilisation. Indirectly, this roadmap increasingly recognises TVET as a viable option for supporting industrial development. As such, the TVET system can play an important role in equipping youth and adults with the skills required for employment, decent work, entrepreneurship and lifelong learning as a key area for resuscitating the economy and achieving the stated 2019-2022 objectives.

Although greening TVET is a key driver of industrial growth, creativity and export-driven growth through manufacturing, it is currently not clear (information is sparse) whether TVET institutions in Eswatini are fully engaged in the greening process. Despite recognising that green courses such as wind energy (Sanchez Lopez, 2006), biofuels (Maia et al., 2011), waste management and natural resource management (Maia et al., 2011), railway and bus transportation systems (Naidoo, 2009), solar and waste to energy (Maia et al., 2011) can create more than 350 000 self- or non-self-employable environmental protective green skills, none of these are clearly reported to be on offer at TVET institutions in Eswatini.

Information is also sparse on whether the 767 TVET educators have green skills with recognisable qualifications to teach green courses. In addition, given that greening TVET can play a major role in contributing towards the development of a green economy (UNEP, 2011) TVET systems in Eswatini need to produce more job creators rather than job seekers. Hence, there is a need to conduct more research to understand TVET efforts on greening and producing green skills in Eswatini. Otherwise, important information about greening the TVET campus, greening the curriculum and training, greening research, greening the community and workplace or greening the institutional culture will remain either insufficient or scarce for good.

4.2.3 Greening TVET and community education in Mozambique

In Mozambique, several programmes are concerned with environmental issues and encourage good environmental practices. In 2011, the Biofund (a foundation for the conservation of biodiversity) was created. It is concerned with the protection of ecosystems and has supported several initiatives related to biodiversity and sustainability. According to Biofund (2019), training programmes, in partnerships with Southern African Wildlife Conservation are provided for youth, and, to date, has trained several Mozambicans at various levels and courses in conservation.

Institutions that teach vocational courses related to the environment in Mozambique are involved in projects linked to national parks and reserves, such as the Chimamene reserve in Manica Province and the Limpopo and Gorongoza reserves in Sofala and Gaza Province. These courses have provided opportunities for training to many young people.

According to the National Administration for Conservation Areas (ANAC, 2018), these projects also empower surrounding communities in conservation, encouraging tree-planting, good agricultural practices and coexistence with biodiversity. Teaching beekeeping techniques is one of the strategies that guarantee the sustainability of communities, thus avoiding the destruction of biodiversity in the areas surrounding the Chimamene reserve. To date, more than a thousand families have benefited from this type of agriculture, which significantly reduces environmental damage (ANAC, 2020).

According to MITADER (2019), some of the higher education institutions, in partnership with the government, teach environmental management courses in order to tackle the country's environmental problems. Rovuma Nampula University, through an environmental management course, has carried out university extension work annually to bring university services to the community. Through these services, they make the community in which they are situated aware of the importance of good environmental practices, such as the importance of tree-planting, and the development of solid waste management plans.

According to the Ministry of Agriculture, through the National Directorate of Land and Forests (DNTF, 2009), the government launched a challenge to various institutions and government partners to respond to environmental problems. Initiatives such as a tree being planted for every student was initiated. Other learning opportunities have been realised through volunteer school and community environmental awareness raising initiatives. In this regard, the environmentalist Carlos Serra, quoted in *Vision*, believes that the implementation of school disciplines on the preservation of the environment can bring added value.

4.2.4 Greening TVET in South Africa

In South Africa, the most significant programme dedicated to the greening of TVET in South Africa, is that between the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ), the Department of Higher Education and Training (DHET) and the Department of Environmental Affairs (DEA). The intention of the programme is to establish green environments in the country's TVET colleges, to establish the role and tasks of TVET colleges in the country's transition towards a green economy and to promote a pathway towards skills for green jobs (Grunwald, 2014).

Some of the programme's areas of focus include:

1. Green Campus: The intention is to reduce the ecological and carbon footprint of students and staff on campuses through initiatives such as green construction and buildings, waste minimisation and recycling, reduction of energy consumption, green landscaping and consideration of biodiversity on campus grounds.
2. Green Curriculum: The National Certificate (Vocational) (NC(V)) curriculum in TVET colleges has been expanded to include a new optional vocational subject on renewable energy and energy efficiency technologies. Qualified TVET lecturers are also given training in the methodology and pedagogy for the new curriculum as a way to support their continuous professional development (CPD).
3. Green Community: Various stakeholders were consulted and integrated in the greening process through a cascading model that involved companies to train communities though 'train-the-trainer' programmes. Training involved how to reduce the carbon footprint on TVET campuses and the implementation of green projects to improve the living conditions in surround communities.
4. Green Culture: The aim is to develop green mindsets and build capacity to prepare TVET students for the green industrial labour market. The intention is for these students to feed into the transitioning green economy, where they can apply green knowledge and skills learnt.
5. Management Integration: TVET colleges developed their own management plans by embedding a green framework. Some management policies were amended as greening TVET institutions requires leadership and re-thinking of policy. Boland College in the Western Cape, for example, developed an environmental management and sustainability policy for proper implementation of the green project.
6. Eleven of the 50 public TVET colleges from five provinces in South Africa participated in the development of special green profiles and the integration of green issues. These colleges are connected to a network of campuses and colleges nationwide as well as internationally.

4.2.5 Greening TVET and community education in Zimbabwe

A number of programmes support the greening of TVET and VET in Zimbabwe. Some of these are presented below.

The Green enterPRIZE programme supports VET training institutions as they design and implement new training programmes or revise their existing ones (ILO 2019). TVET institutions across Zimbabwe were identified to find possible entry points for cleaner processes in curriculum (e.g. the motor mechanics curriculum and practices relating to the disposal of waste material such as used oil).

Following the recommendations of the skills assessment, VET institutions now provide new courses for young women and men that ensure graduates enter the market with relevant green technical and business skills. Sectors such as agro-processing, including the packaging industry, dairy and beverages and plastic recycling (such as PET bottles) were identified for skills training under this initiative. The programme also sought to strengthen

the capacity of the TVET and professional training institutions to design and implement programmes that provide business and technical skills for green jobs in a gender sensitive manner.

The Green enterPRIZE, Innovation and Development programme anticipated that 3 000 students would have acquired the technical and business skills from at least 20 vocational training institutions and that 1 000 will be employed and economically active by the end of 2020 (ILO, 2019). The programme also targeted business owners and employees who are expected to refresh their skills to keep up with the demands of the modern labour market.

As a result, the programme reduced youth unemployment, increased the number of formal and growth-oriented enterprises and reduced the unsustainable production processes of small and medium-sized enterprises in Zimbabwe. While this intervention was implemented, it has not been easy. Small and medium enterprises cannot easily invest in their employees and re-skilling and up-skilling activities needed for greening cannot be addressed as training at TVET institutions can be costly. As a result, emerging green linked occupations sometimes often go unfilled.

4.2.6 Greening TVET and community education in Zambia

In addition to the Green enterPRIZE programme, a development fund has invested in the development of various green programmes in TEVET institutions in Zambia. Among the institutions that were funded were St. Mawagali (formerly the Choma Trades Training Institute), Mwekera Forest College, and the Mufumbwe, Samfya and Chisangwa Youth Resource Centres.

St. Mawagali, an NGO training centre, focuses mainly on solar energy, which includes solar installation, maintenance and repair. These courses are provided as it is recognised there is a need for skilled persons to install solar systems, maintain and repair them. These renewable energy knowledge and skills are valuable in TEVET in order to meet the UN's Sustainable Development Goals (SDGs) and other environmentally-related issues.

In comparison, Mwekera Forest College aims to impart a conservation mindset among students, with a focus on beekeeping. The college trains locals on suitable types of flowers and trees, and how to make beehives from wood. The training also ensures residents develop an appreciation for the forest as an important aspect of their livelihoods. This is contrasted to cutting down trees for charcoal. Through this green programme, students became aware that cutting down trees endangers the production of honey. In addition, students are also trained in making by-products out of honey combs such as candles, floor wax and glue.

This value addition plays a critical role in increasing worth from raw materials in Zambia. It is noted that value addition even at a small scale has the potential to grow and feed into large industries through business linkages workable by auxiliary government institutions.

Beekeeping vocational skills training is also offered at the Mufumbwe NGO Youth Resource Centre. Programmes are tailored for rural adults and youth who stopped going to school and feared that the school system had no space for them. With this programme, they find it much easier to fit in the learning and training which links to the environments familiar to them, and the training is based on accessible resources in their locations.

Mufumbwe has vast forests which, as with the Mwekera Forest College programme, is a valuable source for beekeeping. In the beekeeping programme, students are taught the skills to make beehives, how to attract bees, how to manage bees, and how to harvest the honey, process it and retain the bees.

The apiaries have been made combining both traditional and modern methods in order to enable students to utilise the materials available. Students are also taught to form cooperatives for keeping bees. This is meant to increase honey production so that they can meet market demand. These skills have helped the locals increase their income generating levels (Siachiyako, 2018).

In the case of the Samfya and Chisangwa Youth Resource Centres, they collaborate to provide silviculture (tree-planting and management) training. The training seeks to combat environmental issues and nutrition via fruit production. This programme helps youths know how to graft trees to produce oranges. The centres also train local adults and youths in grass-clearing, carpentry and grass-roofing. This tripartite skilling approach provides students with a diversified set of skills (Siachiyako, 2018).

These examples illustrate small visible pockets of excellence, which have, to date, not translated into any coherent plans or co-ordinated national greening of TVET initiatives.

4.3 The impact of Covid-19 on TVET: Selected SADC country insights

The Covid-19 pandemic which started in Wuhan, China in December 2019 has exposed the SADC region, and the rest of the world, to significant and unprecedented economic hardships (World Bank, 2020). The pandemic literally shutdown the entire global economy including work and schools from March 2020.

As of June 2020, UNESCO data suggested that over 1 billion students, including those in schools, training institutions and universities across 144 countries were affected by school closures as a result (UNESCO-UNEVOC, 2020). 91.4% of the world's student population were unable to go to learning institutions, due to regulations and measures put across in order to combat the spread of Covid-19 (ILO and UNESCO, 2020). There is an acknowledgement that "whilst these figures may capture TVET students enrolled in secondary education systems, comprehensive international data on the impact on TVET students is not yet available" (ILO, 2020a, p. 1).

In response to the restrictions imposed on teaching and travel, many educational institutions turned to remote, online teaching (Nash & Eynon, 2020), including some TVET institutions (ILO, 2020a; UNESCO-UNEVOC, 2020). A 'Joint SADC Secretariat-UNESCO statement on ensuring continuity of learning in the context of COVID-19' tagged *#LearningNeverStops* acknowledged the enormous impact of Covid-19 on education (UNESCO, 2020).

The joint statement and mitigation response centred on providing innovative online learning solutions for all forms of schooling, thereby "making distance learning possible for all learners at all levels (from early childhood to higher education and TVET) …[will] ensure the continuation of education of all learners and at all levels through distance learning options through locally adapted, technology based, online and off-line solutions for alternative and home-based education" (UNESCO, 2020, pp. 1-2).

Between 3 April – 15 May 2020, the ILO, UNESCO and the World Bank Group administered an online survey with VET providers, policy makers and social partners on addressing the Covid-19 pandemic (ILO, 2020b). Of the total of 1 349 respondents, 186 were from Africa. Key insights from the survey include:

1. The proportion of respondents who did not use distance learning at all is particularly high in Africa and the Arab states in comparison to other regions (p. 10).
2. Roughly 12% of respondents (including the SADC regions of Kenya, Lesotho, Madagascar, Mozambique and South Africa) reported that training is being provided partially remotely and partially face-to-face (p. 11).
3. Respondents from regions that had regularly used distance learning for training before the outbreak are more likely to report providing training remotely. These regions include Europe and Central Asia, Asia and the Pacific, and Americas. In contrast, most respondents from Africa reported that no online or offline distance learning is provided due to cancellations related to the Covid-19 pandemic (p. 11).

While it is currently difficult to measure the impact of Covid-19 across the six countries involved in this study, the insight from the ILO (2020) survey showed that Mozambique and South Africa attempted some form of teaching. However, not many TVET colleges across the region were able to respond accordingly due to a differentiated infrastructure across the region. Of the six countries involved in this study, only South Africa seems to have the requisite infrastructure to support online teaching and learning required of higher education institutions.

This section presents the personal experiences and reflections of the researchers in participating in this study. While there might seem to be some overlaps with previous sections, we have decided to preserve their personal reflections.

4.3.1 Botswana

Covid-19 led to the temporary closure of all educational institutions including TVET centres across the country. This was a precautionary measure suggested by the World Health Organization (WHO) and Botswana's Ministry of Health and Wellness to reduce the spread of the virus. This comes at a point when Botswana is undergoing a

transformation from a resource-based economy to a knowledge-based economy (SONA, 2019) in order to diversify the economy and reduce dependency on non-renewable resources.

echnical colleges are considered valuable resources in this transformation as they produce skilled, hands-on, marketable human resources capable of and equipped with competitive knowledge to drive the economy of the country (*Dailynews*, 2020).

In a public statement dated 10th April 2020, released by the permanent secretaries under the Ministry of Basic Education, the implications caused by school closures during lockdown and the ways government was handling the situation were presented. Classroom learning across all forms of learning institutions during the lockdown period was interrupted. Teachers and students were also released, hence a temporary stop in the traditional teacher–student interactive learning process.

Measures by the Ministry included take-home reading materials, increased lessons via radio and TV and e-learning (among others). This posed a challenge to institutions whose learning mode is predominantly practical and which use school resources, such as technical and vocational education institutions (Gebauer 2019).

Although it proved hard to find exact statistics, private schools in Botswana were able to thrive during lockdown through e-learning as compared to government schools (*Sunday Standard*, 2020). However, the majority of students who attend government schools do not have Internet access in their homes, and some do not have devices such as laptops or smartphones. Others do not have electricity to access online learning material.

Nonetheless, regular updates by relevant authorities aired on local television and radio networks, and material printed in newspapers addressed issues affecting learning during lockdown – motivating students to work and study from home. The country has experienced some challenges in terms of Internet accessibility, as electricity outages have greatly set back the whole project of bringing TVET to youth and vulnerable people with no or little hope and experience during the Covid-19 period (World Bank, 2020).

Some TVET colleges were able to respond to the online learning call from government and students, such as Francistown College. Evidence on its Facebook page suggests the college's efforts were appreciated by staff members, students, teachers and graduates. The institution continued its online advertisement through social media platforms, encouraging people to register for enrolment in a wide variety of programmes the institution offers and provide guidance in career opportunities for TVET graduates.

On the positive side, Covid-19 has presented a crucial opportunity for skills acquired from technical and vocational education institutions to lend a hand in opening up the economy of the country at a time where almost every sector was at a standstill. According to the Ministry of Health and Wellness, schools, offices and every business assisting the public had to meet certain health standards in order to safely open to the public. S

chool renovations had to be done in preparation for students returning from the lockdown to an environment suitable and safe from the virus. These renovations required skills taught mostly in vocational training centres such as building and civil engineering, water and environmental engineering, electrical and electronics engineering, mechanical engineering and chemistry. Office buildings and other private homes required such services which, I believe, benefit mostly people from the informal sector with skills acquired from the technical colleges.

4.3.2 Eswatini

The Covid-19 pandemic has created immense pressure to move the entire TVET system toward e-teaching and e-learning. However, even prior to the pandemic, remote e-teaching and e-learning had emerged as common practice outside the classroom context. Though e-teaching is not e-learning, in most cases it is e-teaching that receives more attention than e-learning from teachers and policymakers. Despite that, no single e-teaching or e-learning approach is equally suitable anymore for different courses currently offered in TVET colleges (Souza & Vaswani, 2020).

All courses are forced to be offered online without a complete understanding of consequences. Because TVET courses have become complex, it necessitated research efforts into identifying and studying how new teaching and learning methods are adapted and adopted (Mukhtar et al., 2020) to improve teaching (Hamdan, Yunos, & Lai, 2020) and learning, absorption and retention of knowledge for (Djumaniyazova & Djumaniyozova, 2020) skilling, upskilling or reskilling (Hoftijzer, Levin, Santos, & Weber, 2020). All this with the understanding that

learning does not only take place at school, but also at work, in social situations and even when someone does simple tasks like household chores or running errands (Mohamed, 2020).

According to educational psychology theories of human development and learning, it is essential to understand individual lifelong learning endeavours and to inform continuous improvements in the teaching process (Kirschner & Hendrick, 2020). Hence, in Eswatini, the analysis focused on understanding social, emotional and cognitive concerns over resolving challenges of adapting and adopting new models of teaching and learning without compromising the quality of teaching and learning with respect to content, pathways and learning environment.

The TVET teaching and learning efforts seem to be more stuck in the social and emotional concerns of resources to smoothen e-teaching more than e-learning (Kirschner & Hendrick, 2020). Cognitive, affective and psychomotor teaching concerns (Rao, 2020) are deplorably neglected. The adaptation and adoption of e-teaching and e-learning were mostly concerned with catching up lost time in skilling, upskilling and reskilling demands (Heyen, Menzemer, Wolff, Beznea, & Williams, 2020).

Online catch-up classes were pressured to promote rapid adaptability in addressing national economic recovery needs (Hoftijzer, Levin, Santos, & Weber, 2020). This did not, however, consider whether or not the mechanisms to constantly and consistently monitor and evaluate quality of e-teaching or e-learning were instituted.

Though quality of teaching and learning in the TVET sector seem to be based mostly on test scores, a high test score (Geiger, Amrein-Beardsley, & Holloway, 2020) is neither a good indicator of quality in teaching (Harrison et al., 2020) nor quality in the learning environment (Safsouf, Mansouri, & Poirier, 2020). In the TVET sector, teaching and learning are rarely assessed based on the quality of teaching content (Yan, 2020), learning pathways (Marder, David, & Hamrock, 2020), learning environment and the quality of content learnt in the process (Rimm-Kaufman & Jodl, 2020).

Moreover, such an argument does not take into account the quality of students' outputs (Koontz, Jager, & Newig, 2020), the quality of students' outcomes, nor the employability of outcomes (Howson & Buckley, 2020). Employable outcomes are skills that originate from students' outputs. Almost all employable outcomes originate from students' outputs i.e. critical thinking (Smith, 2020), problem-solving (Scoular & Care, 2020), independent learning (Sukestiyarno & Dwidayati, 2020), enhanced communication skills (Srisermbhok, 2020), creativity (van Laar, van Deursen, van Dijk, & de Haan, 2020), teamwork (von Bieberstein, Gehrlein, & Güntner, 2020), patience and tolerance (Dinc & Akcakanat, 2020).

In light of this, the TVET sector needs to start producing periodic reports highlighting critical information associated with analysis, design, development, implementation and evaluation cycle (Ansari, König, Leask, & Tokuhama-Espinosa, 2017; Mameteva, Rashchikulina, Potrikeeva, Bezenkova, & Burilkina, 2017; Pramling Samuelsson & Pramling, 2016). In the absence of such reports, policymakers will fail to determine whether or not the quality of teaching and learning was compromised.

Compromised quality of teaching and learning in the TVET sector could undermine the existence of its own purpose – which is to produce self- and non-self employable skills. Skills are crucial in enabling economic recovery anywhere (Beynaghi et al., 2016; Pashby, 2018; Vandala & Bendall, 2019; Zhong, Coates, & Jinghuan, 2019).

4.3.3 Mozambique

According to the Ministry of Science and Technology, Higher and Technical-Professional Education of Mozambique, about 181 colleges of professional and vocational technical education were closed during the pandemic. This has compromised the academic performance of the 2020 academic year.

As a way of mitigating this situation, several measures were put into place – such as the provision of classes via digital platforms and teaching via public television in Mozambique (TVM). However, these methods were reported as ineffective as the practical classes required physical contact in the field or laboratory. This proved impossible. In addition, there was a lack of access to digital platforms as not all students have a mobile device capable of connecting to the Internet nor access to television services. This was particularly the case in rural areas, which led to a disparity in the teaching and learning process, making it more difficult.

Arlindo Brazão, pedagogical Director and Professor at an industrial and commercial institute in Nampula, noted that only 45 percent of students at his institution had access to a cell phone, computer or the Internet. This led to significant setbacks in mitigation attempts. Students complained about the lack of understanding, especially in technical and practical disciplines, where they lacked knowledge or understanding of techniques or equipment.

The difficulty in clarifying doubts of each student on the part of the teachers also contributed to the list of problems. For some TVET colleges, the pandemic restrictions compromised the maintenance of general services, tuition fees, rental of laboratories and spaces such as fields and amphitheatres. In addition, many companies in Mozambique that partnered with TET institutions to offer internships have declared bankruptcy. This is likely to hinder the teaching and learning process, as well as the placement of staff in the labour market.

Some courses taught by TVET colleges, such as agriculture, mechanics, metalwork and electricity have significantly enriched the lives of communities by generating positive impacts. However, with the closure of these institutions, most activities have been committed to providing technical support to TVET students and farmers due to the eminent agricultural campaign.

4.3.4 South Africa

The Covid-19 pandemic has highlighted the importance of practical service sector jobs. These essential workers include grocery store owners, small-scale farmers and logistics workers. At the height of the lockdown, most educational institutions, including TVET colleges, were closed due to Covid-19 regulations. As a result, teaching and learning was adapted to online learning, TV, radio or print materials. However, since the main focus of TVET is on practical skills, remote learning can potentially be a problem.(3)

According to a senior education specialist from the art and design department at a well-known TVET college in Cape Town, the college had requested that staff and students continue with work via platforms such as Moodle or What'sApp groups during the lockdown period. "Staff members were encouraged to think out of the box," she adds. Staff at the college made use of online material via Future Managers' and Macmillan Education South Africa's platforms. However, the practical subjects proved to be the most challenging to complete remotely, as the facilities required are available only at the college.

On the other hand, a student studying mechanical engineering (motor mechanics) at another TVET college noted that his experience during Level 3 of the lockdown has been "weird and strange." Since the majority of the course he is registered for consists of practical work, the class of 20 students have been split into two groups, each doing a rotation of classes per week. There has been no online learning for this particular course.

The practical stations are sanitised regularly, some work stations are closed and students are encouraged to practice social distancing. Students no longer do group work. "Although things are very different to before, I am glad that we are able to continue learning through practicals and it will be possible to complete the course," says the student.

While the two examples above suggest an adequate response to the provision of teaching during the lockdown, and considering the infrastructure availability in South Africa, there has been a claim that TVET colleges have been left behind in e-learning in South Africa (Mafolo, 2020).

4.3.5 Zambia

The UN (2020) cites that Zambia reported its first case of Covid-19 on 18 March 2020. Since then, the numbers of cases have risen. From the time Zambia recorded the first case all schools (from pre-school through to tertiary level institutions (formal or informal) were closed with immediate effect.

In response to guidance from the Ministry of Health, and to adhere to social distancing and the avoidance of crowds to minimise and prevent the spread of Covid-19, the TVET institutions – public, private and NGOs – changed how they provided services to their clients and students (UN, 2020). Most of them temporarily suspended their walk-in services at offices. However, online systems are being used to access different services at TVET institutions.

Remote learning was introduced as a measure to ensure minimum disruption of learning due to the schools' shutdown. These measures have promoted the continuity of education from home. ADEA (2020) recorded that the closure of TVET centres indicated disruptions in the provision of training.

Trainers face many obstacles when providing training, and some lack the skills necessary for remote training. They need time to prepare videos or online training and have limited access to the Internet. Other limitations include, for example, inclusiveness and equity due to the scarcity of resources to procure laptops and smartphones.

Other challenges include access to funding to pay for Internet services and inadequate availability of online learning content. In other areas of the country, students could not access Internet or mobile networks unless they climbed a hill or a tree (Nonde, 2020). As a result, the Ministry of General Education (2020) stipulated that Zambia, in partnership with Zamtel, will provide free bundles to students and trainers for mobile phones in order for them to access and facilitate learning on Tuesdays, Thursdays and Sundays with free calls for five minutes on the same days.

ADEA (2020) added that lessons for students were to take place via text messages, WhatsApp, Zoom, Google Meet and Microsoft Teams. However, most of the lessons taught are more theoretical: They lack hands-on experience (practical skills). Indeed, this kind of education benefits mainly those who have access to information and communications technology (ICT) knowledge and devices such as laptops and smartphones. It does not favour those in informal settlements and low income households where there is no electricity or any appropriate technological devices.

In addition, some students and trainers do not have the knowledge and skills to operate software or devices fully, even though they have them at their disposal. There is, therefore, a need for trainer capacity building as well as orientation of students to the new systems of learning.

4.3.6 Zimbabwe

In 2016, the introduction of a competency-based curriculum addressed the knowledge and skills deficits among graduates from colleges and tertiary institutions. Ziwira (2020 b), in his article entitled "Higher education: Closing the skills gap," explains the adjustments made in the Zimbabwean education curriculum from the less effective Education 3.0.

Education 3.0 focused more on teaching, research and community service, while Education 5.0 focuses on problem-solving and value creation. It adds innovation and industrialisation to teaching, research and outreach. The positive results of such training were beneficial as the local TVET institutions actively participated in interventions designed to combat the negative effects of the Covid-19 crisis. We share a few success stories below.

In Harare, Zimbabwe's capital, lecturers from TVET institutions, together with local authorities, joined national efforts in combating the spread of Covid-19. With the requirement of the mandatory use of face masks in public and working spaces, the demand for face masks surged. Utilising spaces provided by the council, the partnership had a target of producing 1 500 face masks per week. Such efforts ensured the provision of affordable, washable and reusable face masks for the community's benefit. The partnership later evolved into a business unit for protective clothing production.

In a different locality, Mutare (the fourth largest city in Zimbabwe), secondary schools that offer vocational training subjects such as fashion and fabrics, together with TVET institutions, also joined national efforts in combating Covid-19 through the production of facemasks, protective overalls and hand sanitisers. Such interventions set a remarkable precedent and provided practical experience for students and TVET institutions in self-sustenance through the commercialisation of their skills and converting crises into income-generating projects.

5 Learning from livelihood stories

This section explains the case study work done by the research team, which focussed on investigating livelihoods in the current situation as it emerges. It also provides perspectives on possibilities for more sustainable futures.

The themes explored in the case studies reflect the overarching question of the meaning and manifestations of sustainable livelihoods and decent work as they emerged during Covid-19, and what this meant for learning and intermediate skills or vocational education generally.

This section is presented in two parts. The first presents the types of livelihoods identified in the case studies and associated sustainable and decent work interventions. It is from this descriptive analysis that a critical and analytical assessment of factors that constrained or enhanced the livelihoods of those interviewed is undertaken. The second part explores tasks, skills, knowledge and expertise identified through the case study with respect to green and decent work and learning pathways from a vocational perspective.

5.1 Livelihoods and associated sustainable, green and decent work interventions

In the case studies undertaken by the junior researchers, the work and learning opportunities were assessed in relation to how the individuals undertook these jobs during the initial stages of Covid-19 lockdown. Furthermore, these jobs were assessed on how the associated lockdown restrictions maintained or identified new opportunities to support their livelihoods.

The livelihood cases presented in the case studies include:

1. Soap producer, Mozambique.
2. Recycled bottle top basket, and plastic bag and floor wax entrepreneurs in Lusaka, Zambia.
3. Informal metalworkers, Mbare Siay So in Harare, Zimbabwe.
4. Tuckshop owners in Francistown, Botswana.
5. Small-scale farmers in Cape Town, South Africa and Lusaka, Zambia.
6. TVET educators in Mozambique and Eswatini.

While the work opportunities presented in the case studies illustrate how individuals overcame barriers to maintaining their livelihoods during Covid-19, the question of whether the work is, or could be, green, decent or sustained needs to be investigated from the perspective of sustainable livelihoods and decent work.

An element of this is whether people demonstrated they have the education, skills, knowledge and physical and mental strength required to work and take up and / or improve their employment possibilities during Covid-19 – thereby enhancing their ability and capacity to adapt (referred to as 'human assets' within sustainable livelihoods discourse (Oxfam, 2013, Serrat, 2017). This speaks to some form of tenacity in the individual to overcome barriers and / or identify opportunities to survive a shock such as a pandemic.

A good example of this in the case studies include the soap maker in Mozambique who noted that they had learnt to make soap from their mother and, while studying toward their chemistry degree, had identified the potential opportunities of using coconut waste. The soap maker's focus and dedication to learning through watching videos, experimenting and not following rules gave them the flexibility to overcome hurdles and continue to work during Covid-19.

Other examples of adaptive capacity are evident in the entrepreneurs in Zambia and small-scale farmers in South Africa who recognised the value of adapting to using online mechanisms to sell their products and produce (this is covered more below). The ability to adapt and sustain a livelihood during a shock decreases an individual's vulnerability to the impact of that shock and enhances their 'business as usual' processes of operation (Wright, 2012 et al.).

The work opportunities that seemed least affected by Covid-19 were those that involved the growing and selling of food. This was predominantly due to food in most countries being considered essential goods during the most restrictive phases of lockdown. As such, tuckshop owners in Botswana and small-scale farmers were able to continue with the production and sale of produce and food items. However, there did appear to be a shift in their customer-base during this period.

For example, in the case of the tuckshop owners, customers were, very specifically, their local community. In the case of the farmers in Cape Town, aside from their usual customer base they also provided food relief via NGOs. It should, however, be noted that this was not the norm in South Africa, with many small-scale farmers, particularly those in rural areas, being significantly impacted as they supply street vendors who were unable to trade (PLAAS, 2020).

This illustrates that while the shock brought on by lockdown and the associated tighter hygiene controls did mean an adjustment to the way they sold produce and goods, it did not necessarily impact those represented in the case studies as they were able to sustain their livelihoods. What can also be derived from this adaptability is the importance of an individual's immediate network or community to reduce their vulnerability during a period of shock. The importance of a localised economy and access to social capital (see next section) is, therefore, a critical emergent indicator from this research.

While it appears that those involved in the food production and sale case studies seem not to have been significantly impacted, they were affected from by their customers' reduced income and, therefore, their ability to purchase food (PLAAS, 2020). This reliance on customers for income, and the disruption thereof during the lockdown, was also true for small-scale farmers, albeit in a different way. For example, a small-scale farmer in Cape Town noted that his poorer customers who had paid for eggs pre-lockdown no longer had the financial means to purchase them anymore. As such, he had to forgo the income to provide the eggs for free.

The impact of reduced customer spend was also felt by metal workers in Harare, Zimbabwe who, due to travel restrictions imposed during lockdown, were not able to access their normal supply of scrap metal from farms. As a result, they had to adapt their procurement practices and purchase from local scrap dealers who had increased their prices. This proved a significant constraint and was even more so for those who relied on 'walk-in' trade for business. In such instances, it was noted that some informal manufacturers did not have the skills to navigate the constraints brought on by Covid-19.

The effect of lockdown restrictions on most of the individuals interviewed highlight the significance of having access to and knowing how to use digital tools (online media platforms) and hardware (computers and associated IT infrastructure). In the case of many of the entrepreneurs and some farmers, having an online presence enabled them to continue to sell their goods or produce.

Communication smartphone applications, such as What'sApp enabled them to communicate quickly to resolve urgent issues when social distancing and travel restrictions meant people could not meet in person. While these instances illustrate how digital technologies can enhance sustainable livelihoods, the opposite is also true. This was most notable for educators in TVET colleges.

While the government had published and promoted the use of technical innovative solutions for students to continue studying, the reality was that the lack of appropriate teaching equipment and processes hindered and compromised the acquisition of skills and learning for students. For the students, this can significantly impact their ability to access the job market within their intended timeframe, thus reducing their ability to secure decent and sustainable work.

The lessons learned around green and decent work in relation to responses to Covid-19 suggest that it is more than just technical or practical skills and knowledge, it is also about having the knowledge and capability to overcome challenges, operate a business or to undertake research to maintain or grow market share, particularly when shocks disrupt practices.

An indicator of green and decent work is how transformative the practices were from that of pre-Covid-19 into ones that are more sustainable, environmental or ecological (Oxfam, 2013, Serrat, 2017). Three case studies respond to this indicator: The Mozambican soap maker, a farmer and the recycled product entrepreneurs in Zambia.

In the case of the soap maker, the green economic value of a by-product made from processing coconuts was always considered a commercially viable opportunity pre Covid-19 but revealed itself as a significant financial opportunity during lockdown. The coconut by-product could be used as an ingredient for making soap, and soap is an important part of a cleaning and hygiene routine that helps keep the Covid-19 virus at bay (UNICEF, 2020).

Other examples of waste being used as a source for making products included entrepreneurs interviewed in Lusaka, Zambia who use plastic and bottle tops to manufacture floor wax and shopping baskets. For the small

farmer in Lusaka, the practice of using manure from his chickens as fertiliser is a characteristic of agro-ecological principles which seek to "optimize the interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system" (FAO, 2017, p.1).

These three examples may not be transformative of the job itself, but are certainly instances of jobs, tasks and practices that are transforming an economic system to one which transitions towards a green economy.

Sustainable livelihoods also refer to those which are safe, pay a fair wage, have respect for workers and provide empowerment and social protection (ITUC, 2012). From the perspective of a response to Covid-19, having the skills and knowledge to prepare for such a shock to business or farming practices came to the fore. Being prepared, and having the agency to adjust, is connected to the concept of empowerment. This plays out in whether individuals have the ability or scaffolding, either within themselves or within their community of practice, to prepare for new or adapted skills and knowledge which may be required to overcome and withstand shocks such as a pandemic.

This empowerment, according to Serrat (2017), is one of the key indicators or determinants of a sustainable livelihood. Such empowerment was expressed in all the cases, except for the unemployed youths in Lusaka. They were interviewed to assess their interest and ability to take up opportunities to turn 'trash into cash'. The youths reflected that they did not have the social capital, know-how or confidence to access such opportunities.

According to Connell (2015), having confidence and knowing how to access resources are important criteria for empowerment, which, she suggests, can be gained from taking responsibility for learning, initiating action, and having the ability to overcome challenges. Through having this ability, these youths could contribute meaningfully to their local economies, enhance the sustainability of their future livelihoods and become more self-reliant (Ediagbonya, 2013). The skills and knowledge on how to do so are reflected in Guille and Unwin's (2019) framework for understanding expertise, which is explored in the section below.

5.2 Tasks, skills, knowledge and expertise identified

Case studies have been useful in exploring a framing of expertise: The multi-levels and multi-pronged nature of expertise as framed presented within a VET context and using Guile and Unwin's (2019) framework of expertise, with particular reference to technical and specific or non-specific task expertise.

In most instances, the case studies focused on individuals who had a particular trade or job, such as soap makers, small-scale farmers, tuckshop owners or metal workers. As such the technical tasks they presented related directly to the specifics or technical dimensions of the occupation. For example, for the soap maker such tasks included the making of soap from coconut waste. In the case of the entrepreneur producing bags from plastic waste, one of their tasks included the knitting of plastic. For the tuckshop owner, this included the buying and selling of goods.

However, many of the individuals interviewed mentioned tasks that could be considered non-specific, and, therefore, generic – making them applicable to more than one task or occupation. Examples include: Business and entrepreneurial, research, measuring and cutting, cooking and customer service skills. Guile and Unwin (2019) suggest these tasks will be associated with knowledge and skills which will have been obtained more formally or tacitly (for example, on the job learning and the use of certain tools). Figure 3 illustrates examples of the relationship identified in the case studies.

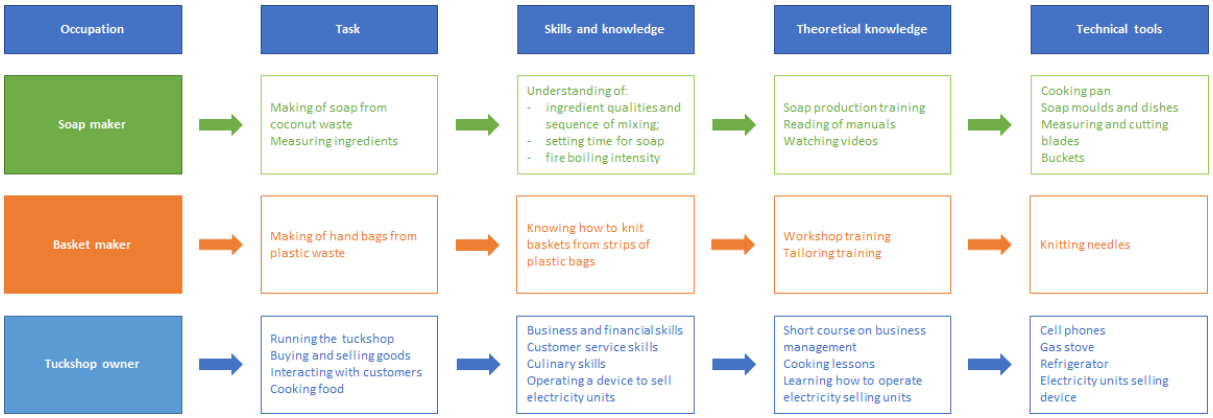


Figure 3: Illustration of case study examples where the relationship between tasks, skills and knowledge is shown

The buying and selling of goods, banking, marketing, negotiating with suppliers and customer relations can be referred specifically to market or entrepreneurial knowledge (Biggiero et al., 2016; Sammarra & Biggiero, 2008). Technical and / or product knowledge referred to by Guile & Unwin (2019) and others (e.g. Dinur, 2011; Moos et al., 2012; Nordqvist & Frishammar, 2018; Sammarra & Biggiero, 2008) is linked to the production of goods or a service, creating designs (as in the case of metalworkers in Zimbabwe and knitted plastic bag makers in Zambia) and knowing how to plant, maintain and harvest food grown is.

While the skills and knowledge mentioned above speak to the undertaking of a task, the case studies allude to the importance of the individual's competency and capability or procedural or to organisational knowledge (Moos et al., 2012; Nordqvist & Frishammar, 2018; Sammarra & Biggiero, 2008) that is required not only to undertake a task by providing an overarching foundation, but also for carrying out business and, therefore, livelihood activities.

Such competencies identified from the case studies include, for example, the ability to focus and problem-solve to sustain an income when Covid-19 and lockdown regulations and restrictions limited access to markets. The types of activities implemented by those interviewed to illustrate such fortitude and ability to adapt included: The identification of different means for marketing their products, such as the use of social media, the hiring of a driver to deliver products when previously-used modes of logistics and delivery were restricted and the purchase of personal protective equipment (PPE) to comply with safety measures in order to continue to trade.

For those selling a craft, online access proved critical for survival during the restricted periods, and, for those who did not have the means to access the Internet or social media to sell their goods, proved to be a significant barrier in continuing to do business. Another digital tool cited as important during the restricted periods was What'sApp, which allowed, specifically in the case of small-scale farmers in Eswatini, to communicate and address urgent issues they faced during lockdown.

The use of online and digital mechanisms for communication require skill and knowledge of how to use these tools, how to communicate with customers or colleagues and also access to computers or smartphones. This is discussed further in the section 'Lessons for VET: Learning from Covid-19.'

These dimensions of skills and knowledge held, acquired and shared by those interviewed suggest that expertise is not just one thing: It is 'bigger' than one dimension. For example, expertise is linked to relationships (social capital). The nature of knowledge is, therefore, multi-levelled and multi-pronged.

The importance of social capital and relationships (a dimension of sustainable livelihoods) emerged as a key source of knowledge and information for the interviewees. For example, the soap maker learnt the value of the soap they made and how it plays a role in improved hygiene to prevent the spread of Covid-19.

In the case of the tuckshop owners, they were informed by their customers as to the types of food that would be most preferred by the local community. In terms of ensuring they 'got the best' deal, the tuckshop owners investigated amongst their community as to who provided the most affordable goods, as well as who was considered a reliable supplier.

The metal workers in Zimbabwe mentioned that they had received much of their training on the job from relatives and friends.

The small-scale farmers in Cape Town acquired and shared knowledge and information on the best way to distribute food, or how and what lockdown regulations to apply.

These examples demonstrate that the interviewees drew on their social resources via informal relationships – such as family, friends and community networks (referred to as social capital (Oxfam, 2013; Serrat, 2017)) – to enable them to enhance their knowledge and skills and, therefore, sustain their work and livelihoods during Covid-19.

This structural dimension of a knowledge network highlights the importance of these channels through which interaction facilitates the generation and flow of knowledge (Nahapiet & Ghoshal, 1998; Sułkowski, 2017; Van Reijsen, 2014).

Access to local knowledge, in terms of geography, proved a significant indicator for knowledge access during the Covid-19 restrictions. Most notably, given the travel restrictions imposed on local businesses or access to formal courses during periods of lockdown, local community knowledge – like speaking to those within the same occupation or operating in the same sector (for example, farming) appears to have emerged as a valued and important source of knowledge generation and acquisition. In addition, the drawing on and access to parents or grandparents for knowledge appears to have also been a key source of insight to overcome local responses to Covid-19 and businesses' survival.

One example is the youth in Francistown, Botswana who, due to restrictions imposed on the import of food stuffs from South Africa, began to appreciate the value of and explore opportunities for growing their own food. The respect for, and interest in, their parents' or grandparents' knowledge and skills, and availability of land, emerged as an opportunity due to Covid-19.

The types of skills and knowledge the youth were interested in acquiring from their family members was the growing of indigenous foods, how and when to plant, and what crops would be best to grow in their particular environments. Within the framework provided by Guile and Unwin (2019), these relational aspects of practice are categorised as interpersonal dimensions of expertise. These knowledge-generating relationships reflect the interpersonal and relational aspects of practice (Guile & Unwin, 2019).

For these relational aspects to prove effective in the transferral and acquisition of knowledge, language, shared value and trust, they must be held either within the community of practice or between individuals (Bonfim et al., 2018; Moos et al., 2012; Nahapiet & Ghoshal, 1998; van Reijsen, 2014).

A good example of trust is the tuckshop owners operating in Francistown. Here, a tuckshop owner noted that trust between her and her customers was critical for doing business, particularly when a customer needs to buy on credit. The tuckshop owners noted that the food they sold was determined by customer requests. They thus need to trust that the selling of these foods will generate a sustained income. Nahapiet and Ghoshal (1998) suggest that these elements, or the lack thereof, can either enable or inhibit effective and efficient knowledge exchange.

The case studies highlight that vocational skills, knowledge, learning and expertise play a significant role for the interviewees in terms of their ability to adapt and survive during the most severe period of Covid-19 restrictions. In the case of sustaining livelihoods through green and / or decent work, the following key elements emerged:

1. Having the **adaptive capacity to withstand shocks**, such as the pandemic, and associated economic and logistical impacts is critical.
2. Those who were able to adapt, or identify or enhance their green economic activities, had the **social capital and agency t**o do so. Therefore, individuals need to feel empowered, need to have the know-how about how to adapt and adjust their practices, seek new opportunities to learn or implement financial interventions to reduce their vulnerability to shocks.
3. The importance of a **localised economy and interpersonal relationships** became evident as entrepreneurs, small-scale farmers, store owners and metalworkers relied on more localised sales or access to materials due to travel and consumer restrictions.

4. Covid-19 reiterated, and, in some instances, initiated, **green economic practices** via the recognition that waste or by-products from manufacturing could be a valuable source of materials or ingredients for products that generate an income.
5. **Access to online channels for local trade or learning connections** were critical for survival during this period. The ability to trade and communicate via IT solutions resulted in access to new markets in some cases. However, this meant the need for new business skills, such as how to enhance your online profile, or how to trade online. In the case of online learning, the processes for delivering vocational instruction, enhanced IT infrastructure and access to computers, smartphones and data / Wi-Fi for students proved critical, and, in many instances, were a hindrance to accessing learning where they were not available.
6. With reference to Guile and Unwin's (2019) framework, the **technical, interpersonal and embodied (physical conduct) dimensions of expertise** proved most evident in terms of adaptability and survival. For example, specific knowledge required to grow and sell produce, or knowing how to rely on and use interpersonal relationships to identify new avenues for materials or selling goods.

6 Recommendations for Building back better – Lessons for VET: Learnings from Covid-19

Covid-19 has had a significant effect on TVET colleges and mechanisms for attaining knowledge and skills throughout the SADC region. This holds true both for those providing vocational education and for those receiving it. The following assessment draws on the background context during this period within each country and the experiences of the interviewees in the country case studies. It provides insights into the limitations of accessing TVET during Covid-19 and recommendations that could inform TVET and vocational learning to enhance the sustainability of livelihoods and green and decent work in the future.

Given issues of access to TVET colleges during the research period, which was significantly constrained by the restrictions imposed during different levels of lockdown, clear responses to addressing TVET were difficult to discern in the countries studied. This was further impeded by the fact that publicly available discourse and media attention in terms of national responses to the topic generally seemed to have been dedicated to basic and higher education institutions rather than to TVET.

Through the case studies, some of the critical learning through TVET implications included both an impact on students' access to learning and academic staff delivery of courses and practical training. For students, this meant difficulties in maintaining a consistent and equitable learning experience. Other notable impacts on students included the postponement of examinations, lack of financing available for laptops or mobile data packages to continue their studies. These issues and barriers to learning, and ultimately the ability to improve an individual's ability to access work or improve their current working situation, were reflected throughout many of the case studies.

Given these predominantly technical constraints, there appear to be calls for TVET to 'reinvent' itself. However, clear guidelines and national interventions are not yet visible as much of the discourse is rhetorical and without a substantiated pathway to action. Such a pathway, or reinvention, could potentially use this Covid-19 shock to the TVET system to:

1. Reform the curriculum (see recommendations below).
2. Increase the focus on occupational programmes.
3. Build and enhance partnerships with local communities, industry and government.
4. Become responsive to 21st century skills – i.e. digitalisation.

At the time of writing, these are difficult to discern in the TVET sector.

With respect to being digitally responsive, this study suggests that if students have the hardware and software, and if colleges have the infrastructure to provide online learning, this could enhance the dissemination of TVET courses. In addition, more students would be able to access vocational courses as they would not need to be physically present at the college. While the shift to more online and digital interventions appears attractive, it is imperative that this route be carefully considered and that the infrastructure, technical equipment, online teaching process and lecturer capabilities are all taken into consideration (Hoftijzer, Levin, Santos, & Weber, 2020).

Without sufficient research data, it is difficult to gauge the preparedness of TVET colleges for online and digital interventions. This makes it difficult to understand how teachers teach and how students learn in a variety of settings, which would enable us to identify and inform appropriate approaches and strategies to make teaching and learning in the TVET sector more effective.

Generally, before deciding to move away from the current physical classroom, social context, teaching and learning context (Watson, Timperio, Brown, Best, & Hesketh, 2017), it is advisable for feasibility (Sanseau et al., 2020) and conformity studies (Reingold & Baratz, 2020) to be carried out and for findings to be thoroughly reviewed. Otherwise, adaptation and adoption of potential teaching and learning methods in the local context will be drastically quickened based on inadequate, unsuitable or incomplete evidence. Whether quality in teaching and learning is accidentally or intentionally relaxed, higher pass rates can still be secured, catch up teaching and learning classes can still be successfully arranged, and the syllabus can still be fruitfully completed (Berkovich, 2016; Culp, 2017; Kawka & Larkin, 2018; Schwartz, 2017; Tomo, Todisco, & Mangia, 2019).

However, this is not a sure way to guarantee or save current and future SADC-wide efforts on economic recovery. Though not yet verified, the following quotation sums up all the consequences of accidental or intentional compromise in quality of teaching and learning in tertiary education. The words were apparently affixed to the entrance gate at a South African university:

> *Destroying any nation does not require the use of atomic bombs or the use of long-range missiles. It only requires lowering the quality of education (teaching and learning) and allowing cheating in the examinations by the students. The result is that: Patients die at the hands of doctors. Buildings collapse at the hands of engineers. Money is lost at the hands of economists and accountants. Humanity dies at the hands of religious scholars. Justice is lost at the hands of judges. Because, the collapse of education is the collapse of the nation.*

The quotation supports the idea that no new teaching and learning methods should be haphazardly be adapted and adopted without local evidence. Continuous research efforts in educational psychology are needed to constantly and consistently inform policymakers about feasibility and quality conformity of any potential teaching and learning methods. Newly-adopted methods should be those that guarantee over 80% that quality of teaching content, learning pathways, learning environment and quality of learnt content will be upheld when assessed against outputs and desired outcomes of learner centred teaching (LCT) (du Plessis, 2020).

Another learning identified in the case studies is that while courses (and perhaps revised courses and mechanisms for access) may be reinvented post Covid-19, potential students need to be able to finance their studies. Students must understand and know how to access: 1) Government funding and study opportunities and 2) business internships to cover on-the-job training.

TVET colleges need to conduct more research in areas of educational psychology (i.e. narrative and systematic reviews (Martin et al., 2020), so that policymakers are equipped with updated, suitable, complete and adequate information on resolving challenges when adapting and adopting new models of teaching and learning without compromising quality.

The need for curriculum reform was noted as being a particularly accurate reflection in South Africa. From a qualification and curriculum perspective, for example, the Nated programmes are outdated, with some curricula dating as far back as 1975. Therefore, there is a demand and need for the curricula to be more responsive to industry needs to and to be able to meet 21st century learning needs. Notable examples of where this was suggested was in the provision of courses on how to conduct an effective and sustainable business online. This includes having a viable online presence and how to enhance and use social media as a business platform to sell goods and produce, for example.

With the restrictions lockdown placed on customers' access to farmers, metalworkers and entrepreneurs, many realised the need to find an alternative way to market and sell their products. This resulted in a shift towards online platforms to do so. While the shift was exacerbated by the shock to their normal business practices, it is one that is likely to continue to be adopted long after Covid-19 and its restrictions have passed. Therefore, the need to improve these skills will increasingly be sought by potential TVET students as a way to reduce their vulnerability during periods of crisis by offering new and alternative routes to markets.

While IT is an attractive solution for improving livelihoods through the expansion and strengthening of social capital, increasing the ability to deal with emergencies and to enhance efficiency (Shaibu, 2018), a lack of IT access or literacy can hinder such opportunities. Therefore, an explicit acknowledgement of these challenges (US Department of Education, 1996) and recognition that not all VET students will have the same level of IT literacy, or access to IT, is required. A lack of recognition can create a divide between those who have and those who do not (Fobosi, 2017) and, within the context of this study, the ability to enhance their livelihoods through online mechanisms.

This demand for online and digital skills could be incorporated into or complement business and marketing courses (which were also cited by those interviewed as a need). The types of knowledge interviewees cited included how to operate a business for growth and continuity, financial management and literacy, marketing skills and how to acquire capital. Such demands suggest that Covid-19 showed up the interviewees' knowledge gaps and the precariousness of their businesses.

In the context of sustainable livelihoods, this suggests the interviewees felt that by having such knowledge or learning opportunities made available, they could enhance their education, skills, knowledge and physical and

mental capabilities to work and take up and / or improve their employment possibilities (Oxfam, 2013, Serrat, 2017).

In reference to the need for occupational programmes and curriculum reinvention: A number of calls were made by those interviewed for vocational courses which focused on providing practical knowledge and skills, such as sewing, cooking, gardening, farming (e.g. how to plant crops and maintain soil fertility) and operation of advanced or computerised machines. Such practical skills and knowledge would enhance current practices (e.g. diversifying products, ensure skills are up to date or improve the success of crop production and yields). Technical skills (Guile & Unwin, 2019) are specific to the occupation and, if made available, are likely to improve the sustainability of livelihoods.

Non-formal VET has grown during this time, with numerous local initiatives emerging alongside efforts to support local economies. This has prompted the agentic desire for new knowledge and skills.

However, mechanisms to support and sustain livelihood enterprises that have emerged during Covid-19 are unclear. While respondents could articulate types of knowledge and skills to move forward with and develop, they were unclear about where and how they could receive such capacity development. In addition, they often struggled to articulate what such a pathway may be – particularly the metalworkers in Harare. Thus, links between these livelihood enterprises and an emergent VET pathway appears unclear because sign posting (i.e. career guidance and advice) in the vocational context is similarly unclear.

This, therefore, suggests that sign posting is required for a particular vocational pathway. For example, signals on how to become an engineer or doctor are clear, but, in a vocational context, the sign posting appears unclear for many professions. In some instances, such as in Eswatini, while small-scale farmers may have been able to articulate a pathway they wish to follow, the country lacked TVET institutions which could offer such learning opportunities.

Since agriculture is a major contributor to the livelihoods of many people living in rural areas, the lack of agricultural education is a concern. This brings to the fore the importance of other vocational learning opportunities, such as NGO training and community colleges or adult training centres. Such institutions or organisations could reorientate their focus to respond to local vocational needs and thereby offer pathways for individuals who wish to enhance their education.

In summary, TVET recovery responses require clear direction. The responses must focus on deep systemic transformation. During the Covid-19 pandemic, the refocus on the local (particularly local products, economies and waste) as a resource illustrated the re-emergence of green economy / circular economy in the communities. Links between VET institutions and livelihoods in communities need to be explored further as they hold important lessons for supporting adaptive capacity in communities and understanding how to connect livelihood opportunities into entry level transitions and formal VET.

References

ADEA. (2013). *African Union Commission Pilot Indicators: Zimbabwe Case Study*. Association for the Development of Education in Africa (ADEA). http://www.adeanet.org/sites/default/files/au_education_indicators_pilot_study_-zimbabwe.pdf

ADEA. (2020) *Delivering education at home in African member states amid the Covid-19 pandemic*: Country status report. Association for the Development of Education in Africa (ADEA). http://www.adeanet.org/sites/default/files/report_education_at_home_covid-19.pdf

AFDB. (2020). *African Economic Outlook 2020*. Retrieved from https://www.afdb.org/en/documents/african-economic-outlook-2020

Akoojee, S., & McGrath, S. (2004). Assessing the impact of globalization on South African education and training: a review of the evidence so far. *Globalisation, Societies and Education, 2*(1), 1-39.

ANAC. (2017). *Community projects*. http://www.anac.gov.mz/en/projects/community-projects/

Batlegang, B. (2012). Green computing: Students, campus computing and the environment: A case for Botswana. *Journal of Information Systems and Communication,* 38750.

Bonfim, L., Segatto, A., & Takahashi, A. (2018). Social capital dimensions, innovation, and technology in Europe: A case-studies meta-synthesis. *International Journal of Innovation*, 6(3), 232-255. https://doi.org/10.5585/iji.v6i3.306

Botswana Qualifications Authority. (2018). *List of accredited TVET providers and learning programmes*. http://www.bqa.org.bw/sites/default/files/TVET%20%20LIST%20APRIL%202018.pdf retrieved on 02/07/2020

Botswana: TVET Ideal for Sustainable Human Resource. (2020, February 19). allAfrica. https://allafrica.com/stories/202002200147.html

Brinkley, I. (2006). *Defining the knowledge economy*. The Work Foundation. http://www.observatorioabaco.es/biblioteca/docs/98_TWF_2006.pdf

Calleja, R. & Prizzon, A. (2019.) *Moving away from aid: The experience of Botswana* https://www.odi.org/sites/odi.org.uk/files/resource-documents/191206_botswana_web.pdf retrieved on 02/07/2020

Cooke, P. (2005). Introduction: The scale question in knowledge creation, capture and commercialization. In P. Cooke & A. Piccaluga (Eds.), *Regional economies as knowledge laboratories* (pp xiv). Edward Elgar Publishing.

Department of Higher Education and Training: Republic of South Africa. (2019). *Statistics on Post-School Education and Training in South Africa: 2017*. Pretoria: Department of Higher Education and Training.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). (2018). *Improvement of Vocational Education and Training*. https://www.giz.de/en/worldwide/77169.html

Dewah J. T. et al. (2005). *Report on the Technical and Vocational Education and Training: Policy Review Framework*. https://unevoc.unesco.org/fileadmin/user_upload/docs/eforum/UNESCO-TVETReportZimb.pdf

DHET. (2017). *Statistics on Post-School Education and Training in South Africa.* Retrieved from http://saera.co.za/wp-content/uploads/2018/03/Statistics-on-Post-School-Education-and-Training-in-South-Africa-2016.pdf

Dinur, A. (2011). *Tacit knowledge taxonomy and transfer: Case-based research*. Long Island University.

Dlamini, T. (2019, May 22). Priorities for 2019-2022. *Times of Swaziland*. http://times.co.sz/feature/123648-priorities-for-2019-2022.html

Dolfsma, W., & Soete, L. (Eds.). (2006). *Understanding the dynamics of a knowledge economy.* Edward Elgar Publishing.

Ediagbonya, K. (2013). The roles of entrepreneurship education in ensuring economic empowerment and development. *Journal of Business Administration and Education*, 4(1), 35-46.

Eicker, F., Haseloff, G., & Lennartz, B. (2017). *Vocational Education and Training in Sub-Saharan Africa: Current Situation and Development*. W. Berteismann Verlag. doi:https://doi.org/10.3278/6004570w

EU. (2020). European Vocational Skills Week. Retrieved from https://ec.europa.eu/social/vocational-skills-week/

European Foundation for the Improvement of Living and Working Conditions. (2018). *Decent Work*. https://www.eurofound.europa.eu/observatories/eurwork/industrial-relations-dictionary/decent-work

FAO. (2017). *The 10 elements of agroecology: Guiding the transition to sustainable food and agricultural systems.* Food and Agriculture Organization of the United Nations (FAO). http://www.fao.org/3/i9037en/i9037en.pdf

Fobosi, S. (2017, September 4). Reconsidering literacy and access in a digital era. *Grocott's Mail*. https://www.grocotts.co.za/2017/09/04/reconsidering-literacy-and-access-in-a-digital-era/

Francistown College of Technical and Vocational Education. (2020). [Facebook page]. Retrieved June 26, 2020, https://iphone.facebook.com/www.fctve.ce.ac.bw/

Gamble, J. (2004). *Tacit knowledge in craft pedagogy: A sociological analysis* [Doctoral dissertation]. University of Cape Town.

Ganter de Otera, P. J., 2019 UNESCO-UNEVOC: Innovation in TVET. Retrieved from https://unevoc.unesco.org/pub/tm_innovation.pdf

Garud, R. (1997). On the distinction between know-how, know-why, and know-what. Advances in Strategic Management, 14, 81–101.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The New Production of Knowledge: The Dynamics of Science and Research In Contemporary Societies*. Sage Publications.

Grunwald, E. (2014). *Greening TVET colleges initiative in South Africa: A guide for practitioners.* Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). https://www.dhet.gov.za/Technical%20and%20Vocational%20Education%20and%20Training%20Co/Greening%20TVET%20%20Colleges%20Initiative%20in%20South%20Africa%20Guide%20for%20Practitioners.pdf

Guile, D. (2010). The learning challenge of the knowledge economy. Sense Publishers.

Guile, D. (2014). Professional knowledge and professional practice as continuous recontextualisation. In M. Young & J. Muller (Eds.), Knowledge, expertise and the professions (pp. 78–92). London: Routledge.

Guile, D. & Unwin, L. (2019). *The Wiley handbook of vocational education and training*. John Wiley & Sons.

Hessels, L., & Van Lente, H. (2010). The mixed blessing of Mode 2 knowledge production. *Science, Technology and Innovation Studies*, 6(1), 65–69.

Heusdens, W., Baartman, L., & de Bruijn, E. (2018). Know Your Onions: An Exploration of How Students Develop Vocational Knowledge During Professional Performance. *Scandinavian Journal of Education Research*. https://doi.org/10.1080/00313831.2018.145229.

Hoftijzer, M., Levin, V., Santos, I., and Weber, M. (2020). *TVET Systems' Response to COVID-19 : Challenges and Opportunities*. World Bank. https://openknowledge.worldbank.org/handle/10986/33759

Hollander, A., & Mar, N. Y. (2009). Towards Achieving TVET for All: The Role of the UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training. In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work: Bridging academic and vocational learning* (Vol. 1, pp. 41-57): Springer Science & Business Media.

ILO-UNESCO. (2018). *A Global Overview of TVET Teaching and Training: Current Issues, Trends and Recommendations*. Retrieved from Geneva: https://www.ilo.org/sector/activities/sectoral-meetings/WCMS_675275/lang--en/index.htm

ILO, UNESCO & WBG. (2020). *Joint Survey on Technical and Vocational Education and Training (TVET) and Skills Development During the Time of COVID-19*. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/genericdocument/wcms_742817.pdf

ILO. (2013). *Decent Work Indicators Guidelines for Producers and Users of Statistical and Legal Framework Indicators*. ILO Manual. https://www.ilo.org/wcmsp5/groups/public/---dgreports/--integration/documents/publication/wcms_229374.pdf

ILO. (2013). *Sustainable Development, Decent Work and Green Jobs.* [Conference paper]. https://www.ilo.org/ilc/ILCSessions/previous-sessions/102/reports/reports-submitted/WCMS_207370/lang--en/index.htm

ILO. (2015). *Five facts about the informal economy in Africa*. Retrieved from https://www.ilo.org/africa/whats-new/WCMS_377286/lang--en/index.html

ILO. (2018). World Employment Social Outlook 2018: Greening with jobs Retrieved from https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_628654.pdf

ILO (2019) G*reen enterPRIZE Innovation and Development in Zimbabwe*. https://www.ilo.org/wcmsp5/groups/public/---africa/---ro-abidjan/---sro harare/documents/projectdocumentation/wcms_623950.pdf

ILO. (2020). *Decent work policy impact*. https://www.ilo.org/global/topics/decent-work/lang-- en/index.htm

ILO. (2020). *Distance and online Learning during the time of COVID-19* (ILO Brief). International Labour Organization.

ILO. (2020). *Environment and Green Jobs* https://www.ilo.org/global/topics/dw4sd/themes/green-jobs/lang--en/index.htm

ILO. (2020 a). Skills for Employment Policy Brief - Distance and Online Learning during the time of COVID-19. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_743485.pdf

ILO. (2020 b). Updated results: Online survey for TVET providers, policy-makers and social partners on addressing the COVID-19 pandemic. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/genericdocument/wcms_742817.pdf

International Trade Union Confederation. (2012). *Growing Green and Decent Jobs*. https://www.ituc-csi.org/IMG/pdf/ituc_green_jobs_summary_en_final.pdf

Johnson, B., Lorenz, E., & Lundvall, B-Å. (2002). "Why all this fuss about codified and tacit knowledge?" *Industrial and Corporate Change*, 1(2), 245–262.

Kathure, C., & Mbijjiwe, J. (2014). "Vocational skills development for youths in the informal sector of the economy of Africa." *Journal of Business and Management*. 81-87.

Kemevor, A. K., & Kassah, J. K. (2015). "Challenges of Technical and Vocational Education and Training and Educational Stakeholders in the Volta Region of Ghana." *International Journal of Humanities Social Sciences and Education*, 2(6), 70-79.

Kirui, O. K., & Kozicka, M. (2018). "Vocational Education and Training for farmers and other actors in the Agri-food value chain in Africa." Working Paper 164. Bonn: Center for Development Research, University of Bonn.

Kona Yuma, G. S. (2010). *TVET Best Practice Clearing House*. https://unevoc.unesco.org/fileadmin/user upload/docs/1963-UNESCO-TVET-ZambiaENG_LR.pdf

Kraal, A. (2007). *Knowledge circulation and the learning economy: Opportunities and constraints in the South African context*. Human Sciences Research Council.

Lundvall, B-Å., & Johnson, B. (2016). *The learning economy and the economics of hope*. Anthem Press.

Masisi, M. (2019). State of The Nation Address 2019. *Mmegionline*.

https://www.mmegi.bw/index.php?aid=83528&dir=2019/november/18

McGrath, S. (2005). "The multiple contexts of vocational education and training in southern Africa." *Vocational Education and Training in southern Africa: A Comparative Study*. 1-8.

McGrath, S. (2011). Where to now for vocational education and training in Africa? *International Journal of Training Research*, *9*(1-2), 35-48.

McGrath, S. (2012). Vocational education and training for development: A policy in need of a theory? *International Journal of Educational Development, 32*(5), 623-631.

McGrath, S., & Lugg, R. (2012). Knowing and doing vocational education and training reform: Evidence, learning and the policy process. *International Journal of Educational Development, 32*(5), 696-708.

McGrath, S., Ramsarup, P., Zeelen, J., Wedekind, V., Allais, S., Lotz-Sisitka, H., . . . Russon, J.-A. (2019). Vocational education and training for African development: a literature review. *Journal of Vocational Education & Training*, 1-23. doi:10.1080/13636820.2019.1679969

McGrath, S., Ramsarup, P., Zeelen, J., Wedekind, V., Allais, S., Lotz-Sisitka, H., . . . Russon, J.-A. (2019). Vocational education and training for African development: a literature review. *Journal of Vocational Education & Training*, 1-23. doi:10.1080/13636820.2019.1679969

Mertineit, K., Müller-Norouzi, M., Hagedorn, C., Jax, A., Assmann, A., Mukokomani, L. & Schönfelder, E. (2018). Strengthening Employment-Relevant Technical and Vocational Education and Training (TVET) in Botswana. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Mgabhi, G., Dlamini, T. & Hlophe, T. (2019, September 19). *Accelerating job creation through vocational skills . . . How can it be done?* https://www.separc.co.sz/2019/09/19/accelerating-job-creation-through-vocational-skills-how-can-it-be-done/

Ministry of Basic Education. Botswana [Facebook page]. Facebook. Retrieved June 26, 2020, https://www.facebook.com/thutomodingBotswana/

Ministry of General Education. (2020). Launch of E-Learning Portal. https://www.exams-council.org.zm/eczpartners-with-zamtel-to-bring-smart-revision-portal/ (accessed on 23/06/2020 at 10:23am).

Ministry of Health and Wellness, Republic of Botswana [Facebook page]. Facebook. Retrieved June 26, 2020, https://www.facebook.com/OFFICIAL.MOHW.BW/

MITADER. (2020). QUADRO DE GESTÃO AMBIENTAL E SOCIAL PARA O PROCAVA: DESCRIÇÃO DO PROJECTO. Ministerio da Terra, Ambiente e Desenvolvimento Rural. https://www.mitader.gov.mz/projecto/quadro-de-gestao-ambiental-e-social-para-o-procava/

Moos, B., Wagner, H-T., Beimborn, D., & Weitzel, T. (2012, January 4-7). *Whom to ask for what knowledge? A comparison of exchange partners and their impact on knowledge types* [Paper presentation]. 45th Hawaii International Conference on System Sciences, Maui, Hawaii.

Mulimbika, F., & Karim, A. M. (2018). "A review of technical education and vocational training in Zambia: Enhancing the role of social partners." *International Journal of Academic Research and Development*, *3*, 140-155.

Muwaniki, C., & Wedekind, V. (2019). "Professional Development of Vocational Teachers in Zimbabwe: The Past, Present, and Future." In S. McGrath, M. Mulder, J. Papier, & R. Suart (Eds.), *Handbook of Vocational Education and Training : Developments in the Changing World of Work* (pp. 1649-1665). Cham: Springer International Publishing.

Nahapiet, J., & Ghoshal, S. (1998). “Social capital, intellectual capital, and the organisational advantage.” *Academy of Management Review*, 23, 242–66. https://doi.org/10.5465/amr.1998.533225

Nash, V., & Eynon, R. (2020). “Coronavirus school closures impact 1.3 billion children – and remote learning is increasing inequality.” *The Conversation*. Retrieved from https://theconversation.com/coronavirus-school-closures-impact-1-3-billion-children-and-remote-learning-is-increasing-inequality-138656

National Technology Business Centre—NTBC (2009). 2009 annual report on the TEVET Graduate Empowerment Scheme. Lusaka: NTBC

Njua, N. G., Mulwa, A. S., Kyalo, D. N., & Mbugua, J. M. (2019). “Project Implementation Factors and performance of Jua-Kali Empowerment Programmes in Nairobi, Kenya.” *European Journal of Marketing and Economics*, *2*(1), 54-61.

Nonde, C. (2020). Latest news and tagged COVID19, Data, Digital Divide, eLearning, Global Coalition for Education, Internet, Public Broadcasters, technology, UNESCO, WHO, World Bank.

Nordqvist, S., & Frishammar, J. (2018). “Knowledge types to progress the development of sustainable technologies: A case study of Swedish demonstration plants.” *International Entrepreneurship and Management Journal*, 15, 75-95. https://doi.org/10.1007/s11365-018-0547-y

OECD. (2011). Chapter 5, ISCED 2011 level 3: upper secondary education. Retrieved from https://www.oecd-ilibrary.org/docserver/9789264228368-7-en.pdf?expires=1593428148&id=id&accname=guest&checksum=FF2ED44A1F0B249DD0CEAC0C1FCDAE19

OECD. (2020, May 6). *VET in a time of crisis: Building foundations for resilient vocational education and training systems. Tackling coronavirus (COVID-19): Contributing to a global effort.* Organisation for Economic Co-operation and Development.

Oketch, M. O. (2009). “To Vocationalize or Not to Vocationalize? Perspectives on Current Trends and Issues on TVET in Africa.” In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work: Bridging academic and vocational learning* (Vol. 1, pp. 531-545): Springer Science & Business Media.

Oxfam. (2013). *The Sustainable Livelihoods Approach: Toolkit for Wales*. Oxfam International. https://policy-practice.oxfam.org.uk/publications/the-sustainable-livelihoods-approach-toolkit-for-wales-297233#:~:text=The%20Sustainable%20Livelihoods%20Approach%20(SLA,help%20them%20improve%20their%20lives

Pharatlhatlhe, K., & Byiers, B. (2019). *Youth unemployment and the role of regional organisations: The case of the Southern African Development Community (SADC)* https://ecdpm.org/wp-content/uploads/DP-252-Youth-unemployment-and-the-role-of-regional-organisations.pdf

PLAAS. (2020, April 1). Food in the time of the coronavirus: Why we should be very, very afraid. *Institute for Poverty, Land and Agrarian Studies* (PLAAS). https://www.plaas.org.za/food-in-the-time-of-the-coronavirus-why-we-should-be-very-very-afraid/

Polanyi, M. (1962). *Personal knowledge: Towards a post-critical philosophy*. Routledge.

RECP and EUEI. 2015. Country Mapping Mozambique http://www.euei-pdf.org/sites/default/files/field_publication_file/TVET_Country_Mapping_-_Mozambique.pdf 23/06/2020

Redacção. (2020, March 11). EDUCAÇÃO AMBIENTAL NAS ESCOLAS, CHAVE PARA GERAR UMA CONSCIÊNCIA FUTURA DUMA JUVENTUDE PREOCUPADA COM QUESTÕES AMBIENTAIS. https://jornalvisaomoz.com/educacao-ambiental-nas-escolas-chave-para-gera/

Republic of Botswana. (2017). *Botswana’s eleventh National Development Plan (NDP 11)*. Retrieved from https://www.tralac.org/documents/resources/by-country/botswana/1865-botswana-11th-national-development-plan-2017-2023/file.html

SADC. (2011). *Strategic Framework and Programme of Action for Technical and Vocational Education and Training in the Southern African Region*. Retrieved from

https://www.sadc.int/files/3713/5548/7214/Strategic_Framework_and_Programme_of_Action_for_Technical____August_2011.pdf

SADC. (2018). *SADC Selected Economic and Social Indicators, 2018.* Retrieved from https://www.sadc.int/files/6215/6630/2592/SADC_Selected_Indicators_2018.pdf

Sammarra, A., & Biggiero, L. (2008). Heterogeneity and specificity of inter-firm knowledge flows in innovation networks. *Journal of Management Studies*, 45, 800–829. https://doi.org/10.1111/j.1467-6486.2008.00770.x

Serrat, O. (2017). The sustainable livelihoods approach. In O. Serrat (Ed), Knowledge solutions: Tools, methods and approaches to drive organisational performance (pp. 21-26). Springer.

Shaibu, A., Hudu, Z. & Israel, M. (2018). Digital technology and rural livelihood: A study of peasant communities in Pru District. *Agris Online Papers in Economics and Informatics*. 10(4), 71-78. DOI 10.7160/aol.2018.100408

Siachiyako C. (2018). *Financing green skills: developing skills whilst creating environmental protection buffer zones*. https://www.teveta.org.zm/articles/read.php?ref=28

Sibiya, A.T. & Nyembezi, N., 2018, 'Examining factors that shape Technical Vocational Education and Training engineering students' understanding of their career choices', Transformation in Higher Education 3(0), a33

Singh, H. & Bhatnagar, J. (2014). *Green Work Life Balance*. https://www.researchgate.net/publication/261394320_Green_Work_Life_Balance/cita tion/download

Skills for Green Jobs (S4GJ). (2014). *From individual competence development to institutional changes: A guide for practitioners. Greening TVET Colleges Initiative in South Africa.* Skills for Green Jobs (S4GJ) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Southern African Development Community (SADC). (2018). SADC Selected Economic and Social Indicators, 2018 Retrieved from https://www.sadc.int/files/6215/6630/2592/SADC_Selected_Indicators_2018.pdf

Stanley, J., & Williamson, T., (2001). Knowing How. The Journal of Philosophy, 98(8), 411–44.

Sułkowski, Ł. (2017). Social capital, trust and intercultural interactions. In M. Rozkwitalska, Ł. Sułkowski, S. & Ł. Magala (Eds.), *Intercultural interactions in the multicultural workplace* (pp. 155–171). Springer International Publishing.

TEVETA. (2017). *2017 Annual Report*. Retrieved from https://www.teveta.org.zm/downloads/?start_at=1&ref=ar&category&keyword=

TEVETA. (2020). *List of registered institutions as at 31st March 2020.* Retrieved from https://www.teveta.org.zm/archive/downloads/1588079407.pdf

The Sunday Standard, (April 2020). "Many students will not be able to study during lockdown because there's no internet" https://www.sundaystandard.info/many-students-will-not-be-able-to-study-during-lockdown-because-theres-no-internet/ (Accessed on 23/06/2020).

UN, (2020) Latest news and tagged Contingency Plan on Covid-19. https://lusaka.sites.unicnetwork.org/category/covid19/ (Accessed on 23/06/2020).

UNESCO. (2015). *Education 2030 Framework for Action.* https://www.sdg4education2030.org/education-2030-framework-action-unesco-2015

UNESCO. (2016). *Strategy for Technical and Vocational Education and Training (TVET) (2016-2021).* https://unesdoc.unesco.org/ark:/48223/pf0000245239

UNESCO Institute for Statistics. (2007). Participation in formal technical and vocational education and training programmes worldwide – an initial statistical study. Retrieved from http://www.unevoc.unesco.org/go.php?q=UNEVOC-UIS%20Report

UNESCO-UNEVOC (2012). *World TVET Database Botswana.*https://unevoc.unesco.org/wtdb/worldtvetdatabase_bwa_en.pdf (Accessed on 22/06/2020).

UNESCO-UNEVOC (2015). *World TVET Database Mozambique.* https://unevoc.unesco.org/wtdb/worldtvetdatabase_moz_en.pdf (Accessed on 22/06/2020).

UNESCO-UNEVOC (2015). *World TVET Database Zambia*. https://unevoc.unesco.org/wtdb/worldtvetdatabase_zmb_en.pdf (Accessed on 22/06/2020).

UNESCO-UNEVOC. (2010). *World TVET Database Zambia*. https://unevoc.unesco.org/wtdb/worldtvetdatabase_zmb_en.pdf

UNESCO-UNEVOC. (2012). *World TVET Database Swaziland.* https://unevoc.unesco.org/wtdb/worldtvetdatabase_swz_en.pdf

UNESCO-UNEVOC. (2013). Regional Forum on Status of TVET in the SADC Region. Retrieved from https://unevoc.unesco.org/home/Status+of+TVET+in+the+SADC+Region+25-29+November+2013

UNESCO-UNEVOC. (2014). *World TVET Database South Africa.*https://unevoc.unesco.org/wtdb/worldtvetdatabase_zaf_en.pdf

UNESCO-UNEVOC. (2015). *World TVET Database Zimbabwe*.https://unevoc.unesco.org/wtdb/worldtvetdatabase_zwe_en.pdf (Accessed on 23/06/2020).

UNESCO-UNEVOC. (2017 a). Greening of TVET emerges as an important agenda of UNESCO project in SADC. Retrieved from https://unevoc.unesco.org/home/SADC%20and%20STEP%20Malawi

UNESCO-UNEVOC. (2017 b). Greening Technical and Vocational Education and Training: A practical guide for institutions. Retrieved from https://unevoc.unesco.org/up/Greening%20technical%20and%20vocational%20education%20and%20training_online.pdf

UNESCO-UNEVOC. (2020). *TVET Peer Support in Response to COVID-19*. Retrieved from https://unevoc.unesco.org/home/COVID-19+disruptions on 23/06/2020.

UNESCO. (2013). *Status of TVET in the SADC region: assessment and review of technical and vocational education and training (TVET) in the Southern African Development Community Region and of the development of a regional strategy for the revitalisation of TVET*. http://hdl.voced.edu.au/10707/377406

UNESCO. (2020). Joint SADC Secretariat - UNESCO statement on ensuring continuity of learning in the context of COVID-19 Retrieved from https://en.unesco.org/sites/default/files/sadc_and_unesco_joint_statement_10.04-hg_002.pdf

UNICEF. (2020). Cleaning and hygiene tips to help keep the COVID-19 virus out of your home. United Nations International Children's Fund (UNICEF). https://www.unicef.org/coronavirus/cleaning-and-hygiene-tips-help-keep-coronavirus-covid-19-out-your-home

US Department of Education. (1996). *Getting America's students ready for the 21st Century: Meeting the technology literacy challenge*. Department of Education, Washington.

Valmonte, L,. & Park M. G., (2009). Regional Accreditation and Certification of TVET Institutions. International Handbook of Education for the Changing World of Work, 1(6).

Van Reijsen, J. (2014). *Knowledge perspectives on advancing dynamic capability*. Utrecht University.

WEF. (2017). These are the 10 best countries for skills and education. Retrieved from https://www.weforum.org/agenda/2017/09/these-are-the-ten-best-countries-for-skill-and-education/

Wheelahan, L., & Moodie, G. (2016). Global Trends in TVET: A framework for social justice Retrieved from https://download.ei-ie.org/Docs/WebDepot/GlobalTrendsinTVET.pdf

Winch, C. (2010). Dimensions of expertise: A conceptual exploration of vocational knowledge. Continuum.

Witt, U., & Zellner, C. (2007). Knowledge-based entrepreneurship: The organisational side of technology commercialisation. In F. Malerba & S. Brusoni (Eds.), Perspectives on innovation (pp 333-351). Cambridge University Press.

World Bank. (n.d.). ZAMBIA: *Technical Education, Vocational and Entrepreneurship Training Development Program Support Project- (Credit No. 3521-ZA: Proposed Amendment to the Development Credit Agreement.* http://documents1.worldbank.org/curated/en/998871468764116945/pdf/31684.pdf

World Bank. (2004). *Skills Development in Mozambique: Issues and Options*. https://openknowledge.worldbank.org/handle/10986/14366

World Bank. (2011). *Technical Education Vocational and Entrepreneurship Training Development Support Program: Project Performance Assessment Report: Republic Of Zambia*. http://documents1.worldbank.org/curated/en/909411468166492312/pdf/625850PPAR0P05000official0use0only0.pdf

World Bank. (2012). Raising Botswana's Human Resource Profile to Facilitate Economic Diversification and Growth http://documents.worldbank.org/curated/en/661471468005140881/pdf/930470WP0P11940C00Botswana0Note01wc.pdf

World Bank. (2014). *Assessing Swaziland's Technical and Vocational Education and Training System to Improve Economic Growth*. https://openknowledge.worldbank.org/handle/10986/25203

World Bank. (2015). *Skills and employability in Mozambique: Implications for Education and Training Policies*. http://documents1.worldbank.org/curated/en/546081468001149545/pdf/96810-WP-PUBLIC-Box391467B-Mozambique-skills-Note-PUBLIC-F.pdf

World Bank. (2020). *COVID-19 to Plunge Global Economy into Worst Recession since World War II*. https://www.worldbank.org/en/news/press-release/2020/06/08/covid-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii

World Bank. (2020). *Raising Botswana's human resource profile to facilitate economic diversification and growth* http://documents1.worldbank.org/curated/en/661471468005140881/pdf/930470WP0P11940C00Botswana0Note01wc.pdf (Retrieved on 03/07/2020).

World Bank. (2020). *Skills Development During a Pandemic: Challenges and Opportunities* https://www.worldbank.org/en/events/2020/06/16/skills-development-during-pandemic-challenges-opportunities

World Bank. (2020). *TVET Systems' response to COVID19: Challenges and opportunities*.

World Food Programme. (2019). Draft Eswatini country strategic plan (2020–2024). https://docs.wfp.org/api/documents/WFP-0000106349/download/

Wright, H., Kristjanson, P. and Bhatta, G. (2012). *Understanding Adaptive Capacity: Sustainable Livelihoods and Food Security in Coastal Bangladesh*. Working paper no. 32. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Zinyuke, R. (2020, May 29). Schools resoundingly respond to COVID 19. *Manica Post*.

Ziwira, E. (2020, March 27). Education: Shaking of Colonial Baggage. *Herald*.

Ziwira, E. (2020, March 27). Higher education: Closing the skills gap. *Herald*.

Zulu, W. V., Mutereko, S. (2020). Exploring the Causes of Student Attrition in South African TVET Colleges: A Case of One KwaZulu-Natal Technical and Vocational Education and Training College. *Interchange*. https://doi.org/10.1007/s10780-019-09384-y

Appendix: Research team

Role	Name	Surname
Thematic Lead	Presha	Ramsarup
Co-leads	Nicola	Jenkin
	Emmanuel	Ojo
JET Research Assistant	Umar	Farouq
Peer reviewers	Stefan	Thomas (ETF)
	Khaya	Tyatya
	Volker	Wedekind
	Robin	Sanasee
Researchers	Katlego	Leshabane
	Deocleciano	Nhazilo
	Orquidia	Chilundzo
	Lazarus	Mfula
	Lebogang	Basimane
	Mkhuleko Mayibongwe	Shongwe
	Tarisai	Manyati
	Tayyibah	Tahier
	Vincent, Mkakeni	Madhlopa