

Vocational Teachers as Mediators in Complex Ecosystems

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Vocational teachers in complex skills ecosystems

At the heart of much of vocational education and training (VET) is an educational process that includes teaching, learning, a curriculum, the learner–teacher relationship and daily decisions taken by vocational teachers in response to contextual factors that affect learning in local settings. This educational process in VET is incredibly complex and often poorly understood. More significantly, VET systems are both criticized and reformed at institutional and curriculum policy levels, but the implications for vocational teachers remain under-researched. Vocational teachers differ from schoolteachers in both status and location within the skills ecosystem. They often exist as both teachers *and* members of a particular occupation and sector. They work in various public and private locations in general or specialist vocational training institutes, training organizations, work-based training programmes or as mentors or coaches in master–apprenticeship relationships (both formal and informal).

The cases within the VET Africa 4.0 project typify contexts where vocational teaching has often been ineffective or behind the curve in terms of knowledge and teaching practice. While our interactions with vocational teachers in South Africa and Uganda reinforced some of these findings, many were frustrated or disillusioned, and confronted daily challenges of limited, outdated or nonexistent resources and equipment, inappropriate curricula, lack of professional development and inadequately prepared or unmotivated students. These concerns were mirrored to a degree by employers and students, reflecting the nonfacilitating verticalities outlined in earlier chapters.

Such challenges can also be exacerbated by crises such as climate change, migration, conflict, poverty, inequality (particularly for women and girls) and more recently COVID-19. All of these affect the world of work and the corresponding role of vocational teachers. They need to face students as individuals – not just robotic productive agents – while also meeting the needs of diverse employers and workplaces and dealing with the expectations of government and the local community. Moreover, they must hold all these factors in balance when working through a learning task with students. While this is an enormous challenge, it is also a potentially exciting and creative space at the heart of a skills ecosystem.

In this chapter, we understand skills development as a complex social ecosystem, as outlined in previous chapters. Vocational teachers are at the centre of this, albeit often without adequate resources and recognition. The skills ecosystem literature to date does not engage with the concept of vocational teachers and their role, positionality and agency within the skills ecosystem. We believe that vocational teachers should be playing a broader mediating role within the skills ecosystem and are central to any reimagining of VET. In what follows, we review typical narratives about low-quality vocational teaching and the challenges vocational teachers often face in contexts such as South Africa and Uganda. We show how subsequent trends undermined the notion of the vocational teacher, drawing on more recent work to argue for a broader version of this notion. The case examples then provide the basis for the discussion of the possibilities (or otherwise) for vocational teachers as mediators. We argue that an expanded notion of vocational teachers needs to be reimagined and embedded horizontally and vertically within the skills ecosystem to facilitate learning that aligns with the broader aims of VET Africa 4.0.

Foregrounding vocational teachers in the skills ecosystem

Vocational teaching is a surprisingly under-researched field in Uganda and South Africa. The limited research available focuses almost exclusively on teachers in formal public VET institutions and generally suggests that they are poorly qualified, undervalued and needing training. In the critiques of African VET in the 1980s and 1990s (outlined in [Chapter 2](#)), claims by [Psacharopoulos \(1981, 1985\)](#) about poor rates of return were explained in part by an argument about VET quality. Similar arguments were advanced by northern governments (especially Anglophone) as youth unemployment rose. While the core problem was labour markets, the rise of the new governance agenda in VET (see [Chapter 2](#)) included a critique of VET teaching quality and led to serial drives to improve initial and continuing vocational teacher education. Paradoxically, these included narrowing the

content of such education and lowering required qualifications levels (for instance, see [Smith and Yasukawa, 2017](#) and [Schmidt, 2021](#) for reviews of the Australian experience). The situation in Africa has generally been seen as more acute, with vocational teacher programmes and qualifications often lagging behind wider changes in the system and not reaching enough new or existing teachers (for instance, [Tukundane et al, 2015](#); [Papier, 2017](#); Muwaniki and [Wedekind, 2019](#)). National and Africa-wide policy documents stress the centrality of teacher quality: ‘The delivery of quality TVET is dependent on the competence of the teacher; competence measured in terms of theoretical knowledge, technical and pedagogical skills as well as being abreast with new technologies in the workplace’ ([African Union, 2007](#): 9). Consequently, both Uganda and South Africa have seen major new initial vocational teacher qualifications in the past decade, though inservice provision has been slower to emerge.

In South Africa, [Blom \(2016\)](#), [Wedekind et al \(2016\)](#) and [Buthelezi \(2018\)](#) accept the general argument about a problem but, helpfully, root this both in limited lecturer qualifications and occupational experience and the wider, impossible challenges faced by vocational teachers. They note that few vocational teachers possess the perceived ideal triple package of significant industry experience, good academic qualifications and sound pedagogical knowledge alluded to in policy documents. However, they highlight the scale of the challenges faced, including major curriculum reforms and institutional mergers; a massive growth in enrolments, mainly consisting of younger learners with lower average prior attainment levels than previously; low salaries, morale and staff retention; and inadequate equipment and resources, despite recapitalization efforts. These concerns resonate widely with work on vocational teachers in other parts of Africa (for example, [Okumo and Bbaale, 2018](#); Muwaniki and [Wedekind, 2019](#)).

A key criticism VET teachers face is their lack of relevance to contemporary labour markets. Industry and employers are often cited in public fora complaining about the poor quality of VET graduates and the fact that they have not been taught the skills needed to be work-ready. This thinking was evident in Australia in the mid-1970s, where VET teachers were seen as providing the skills *they* thought were important rather than what industry needed. As a result, VET teaching was recast with the shift to a demand-driven system, which effectively ‘teacher proofed’ the curriculum by focusing on industry-determined units of competency ([Buchanan et al, 2017](#)). This focus on units of competence and their assessment has been widely embraced by policymakers and embedded in the proliferation of qualifications frameworks ([Allais, 2007](#)), itself part of the ‘VET toolkit’. However, by focusing on responsiveness and competence, the role of the teacher was reduced to that of a trainer or facilitator, negating their educational expertise. This runs counter to a broader notion of a skilled

vocational teacher being what [Barnett \(2006\)](#) called ‘Janus faced’, facing both the world of work and the world of education.

What then is a good vocational teacher? While the literature on vocational teachers internationally broadly agrees with the need for vocational teachers to have a complex mix of foundational knowledge underpinning the occupation, practical knowledge about the work (including experience of work), and pedagogical knowledge and skill, not all systems require teachers to master all aspects of this. For instance, in a dual system where theory is taught in a vocational school and practice is taught in the workplace, there is a division of labour between teachers in these two sites of learning. Similar divisions exist in systems where workplace simulation occurs in school-based settings (with, for example, technicians running the practical workshops). Thus, it is not always necessary for all teachers to have all dimensions equally.

Some writers have argued for a greater emphasis on developing the underpinning theoretical knowledge as this is seen to equip learners to progress and adapt as the world of work changes. These researchers point to the need to strengthen teachers’ theoretical understanding and develop curricula that are broader and cover occupational fields ([Wheelahan, 2007, 2015](#)). In contrast, ensuring that teachers understand the often-tacit forms of knowledge and skill needed in work processes, in order for them to make these explicit to students, requires a much stronger connection to specific workplace settings and requires a stronger integration of theory and practice ([Gamble, 2016](#)).

In addition to these broad areas of competence required by teachers, there is increasing research focused on vocational pedagogy ([Lucas et al, 2012; Wedekind et al, 2016](#)). This literature attempts to draw a distinction between general pedagogical and andragogical principles and a specific set of vocational pedagogies, that is, distinct ways of teaching unique to vocational education. The approaches to this vary, including lists of methods deployed by vocational teachers, the identification of signature pedagogies or the sequencing of specific knowledge and skills. One of the central debates has been the role of real world work settings for vocational learning. An extensive literature exists on workplace learning, internships, simulation, education with production, training with production, mentorship, coaching, apprenticeship and so on that explores how best to learn while working and what the role of the teacher is in these settings (see, for example, [Mikkonen, 2017; Olsen and Tikkanen, 2018](#)). More recently, vocational teaching has begun to grapple with the implications of information technology and how this interfaces with teachers or potentially replaces them ([Cox and Prestridge, 2020; Vaganova et al, 2020](#)). As we saw in [Chapter 5](#), the growth of video-based platforms such as YouTube have made it possible for many learners to access material and teachers at any time or place.

The engagement with skills ecosystem thinking in the Anglophone north sought to move thinking beyond the supply side bias by focusing more on the wider contexts within which skills are developed (Spours, 2019). However, as we noted earlier, despite various theoretical and conceptual iterations of the skills ecosystem, the specific role of vocational teachers within the ecosystem is never explicitly considered. One of the implications of the ecosystemic perspective is the regional focus (Wedekind et al, 2021). By implication, teachers should be understood much more in the local context rather than through the default national lens. For example, a teacher's skills and needs may vary depending on the nature of the skills ecosystem in which they are embedded. Similarly, access to workplaces, and what those workplaces are, is also contextually dependent. For instance, we saw in Chapter 5 that few of these were in the formal sector in Alice or Gulu. This suggests that within a skills ecosystem, vocational teachers might also play a mediating role, a perspective that was confirmed in the case of Alice by Pesanayi's (2019a) research.

The conceptualization of mediation – social actors thinking and moving along horizontal and vertical terrains to arrange exchange and collaborations – opens up the theoretical space to consider the world of working, living and learning and the connective role of education in diverse communities and localities (Grainger and Spours, 2018; Spours, 2019). The preceding chapters have discussed the complex challenges confronting VET, and we are not suggesting that the mediating role of a vocational teacher within the skills ecosystem can solve these challenges. However, an ecosystem perspective suggests that a reimagined VET requires vocational teachers who can recognize the role's mediation aspects and are facilitated to undertake that role. To unpack this, we turned to our four cases to answer the following questions:

1. Where are the teachers within the four cases according to a broader conception of vocational teachers?
2. What are they doing? What distinct types of vocational teachers, curriculum and pedagogical practices are enabled or constrained in the various settings where we find vocational teachers?
3. What are the implications for VET teachers functioning in the mediation space within the skills ecosystem?

In what follows, we present our observations of the 'where' and 'what' of vocational teachers within the four cases, before discussing the implications for vocational teachers functioning in the mediation space with the skills ecosystem.

The ‘where’ and ‘what’ of vocational teaching: case observations

Conventional institutional settings

Throughout the cases, we found vocational teachers located in traditional vocational institutional settings including VET colleges, agricultural colleges and universities of technology (or polytechnics). In eThekweni, there is a well-established set of institutions including three public TVET colleges, three universities and specialized vocationally focused schools. In Alice and surrounding areas, there are two universities, an agricultural training institute and a TVET college. Gulu and Hoima have an array of public and private institutions, most notably Gulu University, as well as several vocational training institutions. Thus, there are multiple sites where vocational teachers are located.

In many of these settings, teachers were constrained by national policies, such as curriculum and qualification prescriptions. In South African public colleges, for example, programmes were developed in a national process with little flexibility to adjust the curriculum to local specificities. Thus, the three eThekweni multicampus public colleges have a very limited specific maritime focus across their offerings. Similarly in the Alice region, there is an urgent need for programmes directly related to small-scale farming in drought-prone contexts. In Hoima and Gulu, most vocational institutions remain rooted in traditional subjects (such as motor mechanics and tailoring) and traditional modes of teaching focused on delivering curriculum content, with limited evidence that these are closely aligned to local labour markets. One of the difficulties experienced by vocational teachers in these colleges is that the standard qualifications on offer appear to have little value in local labour markets. This makes it difficult for vocational teachers to build connections within the ecosystem, and so teachers remain isolated from workplaces.

This is not to deny that some innovation is happening at the programme level. One eThekweni college had started offering a qualification for building yachts and pleasurecraft to align with the strategic imperatives of the Oceans Economy initiative of Operation Phakisa, but this programme was equipping people for jobs that did not exist. This made it virtually impossible for the teachers to develop linkages to local firms. An important example already introduced in [Chapter 1](#) is the local instantiation of the national programme of centres of excellence through the uMfolozi TVET College Maritime Academy. This was established in 2020 to respond to the Ocean Economy initiative. However, national decision making meant that it was located 100 miles from the sectoral hub in eThekweni port. This meant that students and teachers were physically removed from the major existing economic activity associated with the Oceans Economy, making it difficult for vocational

teachers to develop strong industry linkages for learners. In addition, much like the boat building programme, actual job opportunities in this sector were lagging behind policy intentions expressed in the Oceans Economy strategy, as we noted in [Chapter 4](#).

A similar challenge exists in Hoima, where skills are needed in anticipation of the jobs that will arise when oil and gas developments take place. However, there is no real opportunity for teachers to facilitate linkages between their students and employers at present. Thus, colleges and their teachers were trying to position themselves ahead of demand. Furthermore, in Hoima, formal VET institutions are very small by international standards. As noted earlier, they typically offer a broad range of conventional vocational subjects to small classes and with modest resources. Most of this is geared to local and relatively small-scale economic activity and domestic needs such as house building and repairs. Such characteristics make these institutions and vocational teachers ill-equipped to respond to a rapidly emerging sector such as oil and gas where there is an extreme mismatch between skills required and the skills available in remote rural areas. For example, pipeline welding for the oil industry involves vastly different skills and techniques than welding burglar bars, fences or metal window frames, and there are also significant consequences for weld failures. The oil industry is used to commencing operations in remote rural areas and has developed a strong tradition of relying largely on a globally mobile population of highly skilled and experienced artisans. Entry into these occupations is carefully regulated through a set of international certificates that are recognized across the sector globally. Finding skilled vocational teachers that can train to these standards is a challenge, not least because teaching pay scales cannot compete with those in the labour market for similar skills. One principal of a well-regarded institution confided to us that it was difficult to see how this skills gulf was to be bridged.

In response to this skills gap, in much the same mode as the South African centre of excellence (CoE) model, the Government of Uganda built a sectoral CoE, the Uganda Petroleum Institute, Kigumba (UPIK), to maximize insertion into technical and technological jobs in the industry (introduced in [Chapter 1](#)). Staff shared with us how features such as a high-quality curriculum developed in consultation with industry and other relevant stakeholders, along with accredited instructors and quality infrastructure, helped set UPIK apart as a CoE. As vocational teachers, there was a source of pride at the standard of the buildings and the equipment on offer, and we heard that the CoE vision and culture cascaded through the institution to teachers and students. This was a source of inspiration to other vocational institutions.

Elsewhere, within the cases, the universities in eThekweni, Gulu and Alice (the latter in partnership with Fort Cox) pointed to some of the

benefits of educational providers and vocational teachers having a greater degree of autonomy over their curriculum. As we discussed in [Chapter 5](#), the Imvothu Bubomi Learning Network (IBLN) used noncreditbearing short course certificates to bring together groups of stakeholders within an activity system around a shared learning objective. This approach is very different from a diploma or four-year course that must meet national learning outcomes alongside teaching things such as citizenship. Its aim of stimulating social learning around a shared matter of concern in a learning network was also different.

In varying ways, these institutions have responded to top-down policy signals, coordination efforts and the funding opportunities that have arisen. There is evidence of curriculum innovation in the form of new programmes, though in eThekweni some of the responses are essentially a reorganization or repackaging of existing programmes. The two largest and most prestigious public universities, the University of KwaZulu-Natal and the Durban University of Technology, have both created maritime-focused institutes and tailored programmes to offer maritime law, engineering for shipping and maritime studies, among others. They have also created coordinating committees to draw together the disparate strands of work (research, teaching programmes, consultancies) related to the maritime sector and have been able to draw on local industry expertise to enhance their offer. In Alice, Fort Cox went through a curriculum revision process that included a range of internal and external stakeholders to better align the curriculum to developments in the field. This level of autonomy is not present in most of the other institutions in our cases, and consequently teachers can only add to or enhance the official curriculum in often marginal ways.

Flexibility can be critical in vocational teaching. Vocational teachers involved in agriculture spoke of the tension between the organizational cycle of an educational institution and work cycles in the ecosystem. Formal semester structures and conditions of service among staff that mirrored schools rather than businesses meant that both teachers and their students would be absent from campuses for significant periods of time. Thus, an agricultural college attempting to run a fully functional farm has periods where the supply of labour (students and staff) disappears, and so the normal annual cycle of crops or livestock cannot be replicated. This highlights the perennial challenge faced by educational institutions and their teachers when they attempt to simulate working conditions and work processes in educational settings.

Despite these challenges, we also encountered several examples of vocational teachers in conventional formal settings developing innovative practices and overcoming constraints to support their students in accessing work opportunities. One teacher used their networks to source older equipment from companies to expose students to functioning tools used in

workplaces. Several stressed the need to demonstrate workplace expectations in the college, such as health and safety regulations and punctuality rules, to instil behaviours that are expected in the workplace. These practices point to the fact that teachers do have degrees of control over their teaching even when constrained by policy and institutional settings.

External interventions in the conventional system

Within the cases, we also observed several external interventions within the local skills ecosystem. In Hoima, the Skills for Oil and Gas in Africa (SOGA) programme was an intervention cofunded by the British, German and Norwegian governments (see [Chapter 1](#)). Influenced by industry views, SOGA concluded in its inception phase that the skills gap for entry into core jobs in oil and gas was too great for most local citizens. Therefore, it focused primarily on building skills for employment and subcontracting elsewhere in the value chain. This largely consisted of NGO-delivered training programmes in business development and construction trades, the latter to international curricula leading to international certification.

SOGA had the advantage of being very well resourced with a degree of access to oil companies, first-tier contractors and government, and a remit to work with formal VET providers and local and international NGOs. For selected institutions, this created opportunities through several programmes, one of which involved staff and selected students being trained to international standards in welding, electrical engineering and scaffolding. One local Catholic vocational provider was a preferred institution of choice for both funders and private sector actors linked to SOGA. In our survey of vocational teachers in Hoima, teachers from this preferred institution most frequently cited “engagement with the private sector” as one of the professional development opportunities open to them as vocational teachers. However, for all other training institutes, the most frequently cited professional development opportunity was “networking with trainers in similar subjects”. From this survey and our observations across the case, it appeared that this particular intervention enhanced the capacity of vocational teachers to be more responsive to industry demands through their connectivity with funders and external stakeholders.

However, beyond this, SOGA’s wider influence on vocational teaching appears muted. It prioritizes neither national qualifications nor public institutions. While some staff did gain international certification as artisans, there was no intention to change national curricula or qualifications, and the interventions were only in some trades. Ironically, one inadvertent impact of SOGA arose from its focus on health and safety, an imperative for working in the oil and gas sector. This SOGA-funded training had clearly been well disseminated to vocational teachers in the region as this topic was regularly

mentioned, even by teachers in vocational institutions not directly linked to oil and gas. However, in our survey, many responded to a question about environmental sustainability by describing aspects of occupational safety and health and safety certification. This perhaps illustrates how vertically derived and disseminated curriculum interventions do not always get adopted by VET teachers or take root in vocational institutions as planned.

A second intervention was an initiative by an INGO, which aimed to counteract top-down, rigid, curriculum-driven teacher training processes in Uganda. Many vocational teachers were clear that they wanted more support, and some spoke of having to teach topics for which they had no practical experience. One lecturer, for instance, recounted watching YouTube videos in preparation for such teaching. The NGO intervened in this space through targeted programmes and funding. However, they decided to avoid the bureaucratic hurdle of trying to influence the nationally derived curriculum and instead focused on exploiting areas of the mandated curriculum to enhance teacher training. The NGO primarily delivered a curriculum intervention linked to teacher training placements. This involved teaching trainees about student centred and experiential learning, hands-on production and enhancing skills such as creativity, teamwork, initiative and problem solving. The impact on vocational teachers was evident. In our engagement with graduate teachers, it was obvious when they had gone through the NGO's training as they would talk confidently about what they had learnt. However, as with very many teachers globally, they often struggled to put this into practice due to challenges such as lack of resources, time constraints and unmanageable class sizes.

Vocational teaching embedded in work contexts

There is significant teaching of vocational and occupational skills outside formal VET institutional settings. Vocational teachers are found in private sector training organizations, incompany training centres and a wide array of work settings where they mentor, train and supervise students and colleagues. This diversity is only likely to increase as economic organization takes on new forms. Such activity can be linked to formal qualifications or be part of an official internship. However, there is also significant vocational teaching (paid and voluntary) that is not tied to a formal programme. In the main, these teaching settings are embedded in work contexts or adjacent to them, allowing teachers to remain very close to practice.

Within the eThekwin case, there are various private training providers (large and small) offering training in aspects of freight handling, port management and logistics. A prominent example is Transnet, a state-owned rail, port and pipeline company that operates the Transnet Maritime School of Excellence (Transnet SoE). This offers inhouse training for existing and

future employees in areas such as marine operations, terminal operations, port management and port engineering. The embedded nature of Transnet SoE ensures that programmes and vocational teachers are strongly aligned with the skills needs of the biggest employer and role player in the port, with access to state of the art equipment and immersed in the latest procedures and regulations. Consequently, Transnet SoE overcomes perennial challenges faced by vocational institutions (particularly traditional public ones), namely of being out of date or recruiting teachers that are insufficiently experienced in the field of practice.

In company training academies like Transnet SoE have a distinct advantage in that they can staff programmes with vocational teachers who are employees in the sector. Within Transnet SoE, these teachers remain company employees and retain their titles and status such as being called captain and wearing the relevant maritime uniform. In this example, we see how vocational teachers are embedded in a work setting in a way that enables them to remain in touch with the workplace, retain their company conditions of service, make use of the workplace for practical components and facilitate student–employee interaction. This trend is also true for smaller, specialist private providers who are also able to recruit teachers from industry on a part-time basis. To create similar conditions in a public college is extremely difficult as the organizational logic is determined by the priorities of a public college with multiple programmes and conditions of service associated with the public sector.

In a contrasting example from the Gulu case, we encountered a catalytic individual (hereafter referred to as Farmer X) who offered vocational training to the local farming community. Farmer X had a family background in agriculture and an agriculture degree from overseas. He began adopting the role of a nonformal vocational teacher after making the life-changing decision to leave a stressful city job and return to Gulu to start farming. He began by offering an open invitation to the local community to work and learn with him if they wished. What initially started as a small community farm developed into an important provider of agriculture training in Gulu.

Through ongoing processes of learning and colearning with others, Farmer X developed various modes of vocational teaching including online training via video calls and an online learning platform; satellite demonstration farms; taking on students sponsored by NGOs; bringing farmers together to develop quality products for the region and take them to market; and starting a primary school on the farm with a focus on teaching agriculture to children in rural areas. As various strands of vocational teaching developed, some elements began to be more formally connected to different parts of the local skills ecosystem. He designed nonformal practical short courses in agriculture, which were in the process of being formally certified by the Directorate of Industrial Training. He took a significant number of

interns and postdoc students from Gulu University and other Ugandan universities. He sent his instructors to a local public provider to get officially certified. This process of gaining accreditation based on practical experience reverses the standard process of classroom-based theoretical learning and examination-based certification. It is being trialled with Farmer X with a view to becoming formalized within the institution.

Farmer X has become a prominent and outspoken member of the agricultural training community, influencing policy and practice. For example, he received funding to travel overseas as part of a government programme promoting farming, which in turn influenced his practice, and his modular curriculum design is beginning to influence Directorate of Industrial Training policy. However, there is a fundamental problem to this approach in that the original farm now functions as a training farm, as it is not financially viable. Critically, this is a model that other actors in Gulu are also embracing (see [Box 7.7](#)). We heard of various VET students, university graduates and innovative individuals aspiring to set up a business to gain NGO funding to train others. Similarly, other individuals who had set up businesses in farming and tailoring found they had to develop their own hands-on quality training to bridge the skills gap in the local labour force but were then becoming reliant on external funding for training provision. Here we see both a market for quality vocational training and a market for NGO funding that complicates simple notions of supply and demand in a training market.

The potential dependence on NGOs raises a question about the sustainability of this model financially. So does the situation where this type of innovative community-based vocational teaching is tied to one individual and thus may collapse without their central role. However, there was evidence that the vocational teaching initiatives established by Farmer X were on their way to becoming institutionalized in some form through structures such as a board and increased participation of other members of the team and partner organizations involved in the qualifications process.

This example illustrates how one individual can generate benefits in the vocational teaching space for a community and the scope that exists for different actors, including the state, to be flexible across formal, informal and nonformal modalities in ways that support innovations in vocational teaching and curriculum design.

Vocational teachers and collaborative horizontalities

Finally, our cases provided insight on vocational teachers from the perspective of collaborative horizontalities within the skills ecosystem. In some instances, we found examples where policy-driven mechanisms actively sought to connect more marginalized vocational teachers with institutions that

theoretically had closer ties with industry. For example, a senior manager at UPIK reported that it has a mandate to work with other provider institutions so that quality “trickle[s] down” to other institutions. However, UPIK does not currently work in this way, and it was acknowledged to us that, other than programmes linked to international accreditation, UPIK had not seriously considered how it might connect to other institutions and vocational teachers in the region. This is arguably a missed opportunity. Moreover, building a good relationship with major oil industry actors also remains a challenge for UPIK, with inevitable implications for enhancing the capacity of vocational teachers in UPIK and the wider region to respond to industry demands and place their students in viable jobs.

The vocational teachers we engaged with in Hoima spoke of their desire for a more networked peer-to-peer process in which practitioners could share experiences. While these vocational teachers exist in marginalized, resource-poor contexts and might easily be dismissed as ineffective, disillusioned and behind the curve in typical VET narratives, many of them did not fit this stereotype. They were often educated to degree level, with a range of previous experience working in the civil service, the private sector and the community. Many reported improvising in the face of their resource constraints, but it appeared that this was a largely individualized practice, with considerable lost opportunity for knowledge sharing. However, they were also aware of the political sensitivity of establishing and maintaining such structures and the inherent tensions between a professional development and a labour relations focus in educator organizations (Stevenson, 2020). UPIK was linked to the formation of the Oil and Gas Trainers Association, but beyond this no other formal networks appeared to exist.

Indeed, in planning to become involved in Hoima, SOGA identified a lack of collaboration as a key weakness across East African VET systems (GIZ, 2015). However, as we noted earlier, the programme was not aimed at bringing the horizontal and vertical together. It does not aim to implement national policies and build national (public) systems primarily, mindful of the poor track record of donor interventions in these areas. Nor is it a conduit upwards of messages from the horizontal axis. Rather, it is primarily a bridging mechanism between private actors and locals as individual clients. Once again, this is perhaps a missed opportunity to engage more explicitly with vocational teachers who live and teach amid a rapidly changing skills ecosystem.

In eThekweni, from an ecosystem perspective, public and private vocational trainers ideally interact in the form of collaborative horizontalities within the local skills ecosystem. Given the complexity and breadth of initiatives around the port and the maritime economy, there are a range of national and regional mediating bodies to connect the potentially disparate role players on both the vertical and horizontal axis (see [Chapters 1 and 4](#)). Several

employers and mediating and coordinating organizations have developed internship programmes that enable young graduates to learn about the sector. For example, the eThekweni Maritime Cluster (effectively an NGO), and the Special Economic Zone (SEZ) management company, Dube Trade Port (DTP), take on graduate interns and report that these interns have found work in the sector upon completing their internship. Supporting students to find opportunities for work experience is a crucial mediating aspect of the vocational teacher role. Doing so in a sector that is still being developed is a challenge, and these internships give students the opportunity to both experience work and develop important networks in the sector. The DTP has also facilitated training for employers within the SEZ and developed opportunities for trainers and staff to specialize, for example in cargo handling or hi-tech facilities in the DTP Agrizone.

However, despite the existence of several mediating organizations and structures, the case highlights more absences and potential than actual examples of enabling the curriculum and pedagogical practices of vocational teachers and their capacity to mediate within the skills ecosystem. There is limited evidence of coordinated activity or the emergence of an anchor institution that is central to the ecosystem. This has implications for vocational teachers. For example, public provision competes directly with well-established private providers and the Transnet SoE as there is little incentive for collaboration between existing incompany, private and public training providers. Consequently, programmes such as those at the uMfolozi Academy, and the vocational teachers working within them, remain in silos despite attempts to mediate. Even between the public colleges and universities, there is competition for students and consequently little interaction.

A final example on the horizontal dimension is that of the IBLN in the Alice case. As noted elsewhere ([Chapters 5 and 8](#)), the IBLN emerged in 2015 as a joint response to the knowledge needs of stakeholders within the region's smallholder farming system. As well as the public education anchoring institutions already introduced, the network is anchored by cooperative structures such as a dairy cooperative and a youth cooperative, as well as a dynamic collection of individuals including farmers, activists and state extension workers. The Alice case draws attention to the question of what functions are critical to the establishment and sustainability of a learning network, and whether certain types of institutions (and the vocational teachers within them) are needed to fulfil these functions.

Anchoring functions and the relative importance of specific institutions changed as the IBLN evolved. In the early network phase, the role of a well-resourced and established university (Rhodes) capable of planning, funding and convening initial vocational teaching and learning interventions in partnership with the local agricultural college and Local Economic

Development (LED) office was key. Subsequently, it was the network members (individuals and smaller organizations) who were involved in cocreating the curriculum through the questions they asked, the inputs and knowledge they shared and the activities they undertook. Significantly in the Alice case, the training-of-trainers' programme offered in the IBLN was designed to support social learning in a networked learning environment around a shared matter of concern (lack of water for food production). This was strengthened by the subsequent development of productive demonstration sites, in which the agricultural college lecturers provided conceptual and practical leadership that expanded into teaching practice-experiences for their students. This was a major driver of internal curriculum innovations and lecturer professional development (Lotz-Sisitka et al, 2021).

The IBLN illustrates how connections on the horizontal dimension shaped curriculum design and reform, and the role of vocational teachers within that. Core to this was a policy framework developed via a national review of agricultural education by the Academy of Science of South Africa (2017) that motivated the centring of the farmer in agricultural curriculum innovation, which provided institutional legitimacy (a vertical facilitating mechanism) for the VET teachers' roles and their subsequent curriculum innovations. There were also specific individuals outside of formal educational institutions who played an important (unprompted) role in motivating the lecturer group involved in the IBLN and providing positive affirmation and support, especially from the farmers' associations, extension service and the LED office. With adequate pedagogical scaffolding and contextual common sense, there could have been a wider variety of other actors and institutions that could theoretically have taken a lead in anchoring these expansive processes of vocational teaching and learning. What was also significant is that the engagement of Fort Cox Agriculture and Forestry Agricultural College (FCAFTI) with the IBLN led to a substantive philosophical and practical shift in the overall mandate, curriculum offerings and work of the institute. Before the IBLN, they had almost no offerings that attended to smallholder farming needs or sustainability challenges (see Chapter 2). Seven years after the IBLN was established, the college curriculum now directly and explicitly serves the needs of these farmers, which is effectively a curriculum transformation that has been internally driven by the lecturers. Moreover, the lecturers involved in the IBLN have been offering professional development to do the same in other agricultural training institutes (Lotz-Sisitka et al, 2021).

As the IBLN continues to evolve, the subsequent expression of a shared desire to stay connected led to a new set of functional requirements. As membership grew, and the interests of the group evolved beyond the initial focus on water-related issues, the need for specialist knowledge on one key issue (water for food) receded somewhat and the growing need for coordination structures came to the fore, as well as knowledge needs

relating to a broader set of farming challenges (especially knowledge of agroecological methods, dealing with unknown farming impacts from pests, fungi and so on). The formal network infrastructure development involved channels of communication and institutional structures such as a steering committee comprising farmers, college faculty and agricultural extension officers. Members of FCAFTI faculty played a leading role in this committee, which became a cornerstone of the network's coordination and remained in place in 2022. The role and importance of the WhatsApp group as a knowledge mediating tool also expanded, with college lecturers and other experts often sharing expertise and deliberating on questions raised by farmers. Reflecting on the trajectory of the IBLN, it was felt that it was helpful, but not in any way essential, that an educational institution played a leading role in the committee that anchored much of the network. This raises a question about when and how links to vocational teachers within an established and well-resourced institution are necessary for convening and sustaining community-based learning networks.

Discussion: Vocational teachers as mediators?

Vocational teachers play a very complex role in any vocational system. In the social ecosystems we studied, this is extremely apparent. We sought to understand where vocational teaching occurred across the cases and the enablers and constraints on vocational teachers, particularly in terms of curriculum and pedagogical practice. We now turn to the question of the implications from our cases for vocational teachers' functioning in the mediation space within the skills ecosystem.

Vocational teachers need to have expertise as educationists, have mastery of their field of work, be able to understand vertical signals and interpret these for students and mediate that process and link this to day-to-day practices. To that end, vocational teachers are an invisible connection point right at the centre of the ecosystem. However, the constraints of the formal logics of curriculum, teaching institutions and educational systems can make it difficult for teachers to play that role.

Vocational teachers are directly impacted by a variety of signals, affordances and constraints that originate on the vertical axis. There were unintended consequences of vertically derived interventions across the cases. New policies or funding opportunities at times redirected resources away from core activities towards flagship projects and preferred institutions, thus weakening the institutional base that teachers were working in. This highlighted the role that vocational teachers needed to play as mediators of the different signals coming from policy documents. Having well-qualified and quality teachers is key in this mediation space.

There were also opportunities to enhance the role and positionality of vocational teachers that arose because of funder-driven interventions. Interventions (such as SOGA) that are not targeting systemic change can make a difference more quickly than reforms to national policies, and we saw how these interventions could support professional networks of vocational teachers. However, teachers also spoke of these interventions being disparate and uncoordinated. Furthermore, when these interventions are not institutionalized in some form, they can be difficult to sustain both in terms of finances and personnel. For example, once SOGA in the Hoima case and the maritime interventions in the eThekweni case moved on, it was unclear what would be left, and despite the success of the NGO's curriculum intervention, vocational teachers struggled to implement student-centred learning in their day-to-day practice.

Perhaps most critically, the ecosystem model assumes that economic activity exists that can be supported and developed, but what we observed in several cases were examples of top-down interventions for sectors and skills needs that did not currently exist. This reflects a belief that the presence of skilled people will generate demand for those skills, or more positively, an approach where economic interventions were planned, and skills development was being undertaken, to meet anticipated demands. Either way, this creates particular challenges for vocational teachers that need to be considered. For example, how they might play the mediating role between training and the labour market when that space does not really exist. From a transitioning perspective, we also need to ask how they might play a role in supporting VET transformation, particularly when the details of the end point are unknowable.

While we found good vocational teachers across the cases, their ability to make differences to the lives of the students was greatly enhanced where there were collective approaches to curriculum, pedagogy and the student experience that also motivated lecturers to contribute to such processes. This is mirrored in the call of the International Commission on the Futures of Education (2021: 4) for pedagogy to be 'organised around the principles of cooperation, collaboration and solidarity'. For vocational teachers to work most effectively, there needs to be a degree of autonomy that enables them to collaborate and be able to respond to their students' needs and to shifts in the world of work and employer needs, another set of issues highlighted by the International Commission on the Futures of Education. There is a persistent tension between institutional logics, standardizing processes because of national or international qualifications, resourcing mechanisms and the teachers' ability to adapt and adjust their teaching. We did find some evidence of vocational teachers being able to revise the curriculum and respond to local needs. Specific examples included:

- Curriculum ‘bending’, where teachers can respond to the needs of their learners but also bring new examples into the teaching (classroom and demonstration sites) as the field evolves. These are curriculum revisions that do not require a formal review every two to three years, but instead are more alive to shifts in the world of work. In the IBLN case, this was the ‘first phase’, which then led to wider institutional curriculum and educational philosophy and mandate reform reflecting the principle of emergence in the skills ecosystem model, as discussed in [Chapter 4](#).
- Allowing much more local definition. For example, Farmer X’s process of hands-on informal curriculum development and subsequent engagement with formal elements of the system, and the flexibility in curriculum design in the development of certification and new course and programme offerings in the IBLN and FCAFTI.

However, to be innovative and creative in their pedagogical practices, vocational teachers had to find the spaces within formal institutional expectations (such as curricula and assessment requirements). Some of the innovation in vocational teaching that we saw was dependent on particular individuals with vision and energy. Consequently, the role of leadership becomes key. This can be in relation to leading teaching, or leaders having a vision that recognizes the creative space that is needed for teachers to perform these roles. It is not just about the individual agency of vocational teachers, but also about the extent to which they are given the space to do this kind of work and build trust with key stakeholders and employers in the local ecosystem. We observed several examples of individuals in management positions encouraging curriculum innovation in ways that may not be tolerated in other institutions. While Spours writes of system leadership, what we see appears deeper and wider.

Moreover, although we did find innovative practices, for example vocational teachers who went out of their way to source equipment or mirror workplace settings, such small-scale good pedagogical practices were nevertheless quite constrained. There were also challenges in implementation where vocational teachers sought to simulate workplaces (for example, productive workshops in farming). Such constraints appeared less prevalent in nonformal settings. In workplace training, for example, such barriers do not exist because trainees are in a workplace and able to learn while working or in an internship or as an apprentice. This can make it easier for a vocational teacher to inhabit this space as a mediator between learning and working because they inhabit one space and do not have to cross boundaries. Across the cases, vocational teachers were most able to be creative in the spaces where they were not too tightly constrained by formal education requirements and were able to adapt and design the curriculum and learning processes. Examples here include Farmer X and the logic of farming cycles,

and the Maritime SoE designing programmes that are closely aligned with actual work in the port because they are embedded in the port with access to both equipment and workers.

For teachers to maximize their own impact and effectively scaffold learning and work outcomes for their learners requires the building of strong relations on the horizontal axis of the social ecosystem. In our cases, we observed both siloed individualized practice – at times reinforced by competition in the system – and nascent collaborations in various forms, both within and between organizations. At times, these relations were built upon existing institutional relationships and facilitated by formal networks, anchor institutions or other mediators in the ecosystem. However, very often, the vocational teachers themselves had to actively build and maintain these connections. More importantly, vocational teachers (and the local ecosystem more generally) needed support to build such connections across formal, informal and nonformal modalities of VET. Our cases raised questions about who and what institutions and interventions are best placed to facilitate this, and the extent to which vocational teachers need to be linked to well-resourced and well-connected institutions (see also [Chapter 8](#) for a discussion of VET and higher education institution links).

Finally, there was a tension between the autonomy required of teachers to collaborate horizontally and the fairly rigid traditional vocational system that gives teachers little scope for innovation because they are tied to national qualifications, curricula and assessment systems (as discussed in [Chapter 2](#)). Pressures to enrol specific numbers of students, cuts to funding or the arrival of newly funded programmes all generate tensions within the ecosystem that teachers must navigate. The sense of constraint was particularly marked in the public institutions. While some teachers were able to work creatively within these constraints, most teachers we interviewed and observed felt they had little freedom to mediate and do anything but teach to the national programme. Some evidence from the cases also indicates that VET lecturers do have agency for change, however, and that the skills ecosystem approach potentially has an informal role to play in providing collective support for the professional development of VET lecturers through connecting them better to other actors (see [Pesanayi, 2019a](#); Lotz-Sistika et al, [2021](#)).

Conclusion: An expanded notion of VET teachers

That there is so little discussion on the role of teachers in the literature on skills ecosystems is a clear gap. Teachers are central to all aspects of the ecosystem, as interpreters of curriculum, scaffolders of learning and connectors to work. A much tighter relationship is needed between the world of work and the world of teaching and learning. This would involve a constant process of introducing new ideas and new knowledge and new ways

of teaching as both learning and work transform. This requires an expansion of the notion of teachers within the VET system: it is not just those formally part of the education system, but also those who do the training and support in formal, informal and nonformal workplaces. Recognizing that vocational learning happens in and across these places is key, as is ensuring that feedback loops exist between work and the formal system so that curriculum and what happens in the classroom is adjusted and changed as work evolves. This becomes even more vital from a transitioning perspective.

An ideal scenario would see a vocational teacher who is able to mediate between the world of education and the world of work, in terms of their own expertise and experience, so that they have a good understanding of the current workplace practice, equipment and technology and are also a well-equipped educator. In this scenario, the vocational teacher sits in the mediating space, able to cross boundaries between learning and work and help the student to make these connections while also bringing knowledge from the workplace into the educational space and using their educational skills to help scaffold student learning, as well as providing the social connections and social capital to enable the students to enter the labour market.

Recognizing the complexity of a vocational teacher's role poses a challenge to policymakers. One response is to focus on raising the status and professionalizing vocational teaching, but this can mean that it becomes more regulated and tied to issues of qualification requirements, as the Australian experience has shown. This sits in tension with the idea of broadening the notion of vocational teachers and their various positions within colleges, workplaces and communities. However, rather than seeing these as contradictory, we may be able to argue that in a social skills ecosystem geared towards just transitions, there needs to be a way of strengthening both. This might involve broadening our understanding to strengthen VET teachers wherever they are in the formal system, delivering formal qualifications with greater professionalization, while also strengthening the understanding of how teaching and learning works within a diverse range of work-based spaces and nonformal networks and supporting vocational teachers to become more skilled in these spaces.

Wider discussion about improving the quality of vocational teaching points to the fact that many interventions have been driven by relatively short-term programmes funded by international actors, NGOs, development agencies and corporations, seeking to catalyse something within the system. Vocational teachers have many experiences of interventions that are often disparate and uncoordinated. The importance of building horizontal relationships between vocational teachers across and within institutional boundaries is a key finding. Teachers tend to be quite siloed, with institutions often competing for access to funds or access to workplaces with few incentives to collaborate. This ultimately undermines the ability to improve the system.

Adopting an ecosystemic approach and developing horizontal relationships with better localized coordination around professional development activities that develop communities of practice among vocational teachers may be a way to build capacity among the teachers.

There is a need to strike a balance between having stable organizations that can act as anchor institutions, where teachers have a sense of security and professional identity, and enabling teachers to engage in creative work to be mediating actors in the middle of the system and innovators. From a policy perspective, a system is required that empowers vocational teachers to function in the mediating space and play this type of role. This means giving VET teachers some autonomy to work with curriculum, adjust and plan time differently.

For a reimagined VET in Africa, there is an urgent need to recognize the expanded notion of a vocational teacher and the centrality of this role in the skills ecosystems. Indeed, many of the vocational teachers we encountered carried out their work at the centre of largely dysfunctional skills ecosystems and did so in the face of an inexcusable lack of resources and limited support, both vertically and horizontally. Foregrounding the expanded notion of a vocational teacher, and understanding the varied positionality and functionality of vocational teachers in relation to the verticalities and horizontalities in a skills ecosystem, might be a useful first step in enhancing their role in mediation spaces.