




Knowledge Transfer through Public-Private Development Partnerships

Sustainability of TVET Interventions in Ethiopia and Zambia

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Abstract

This article aims to add to the body of literature on knowledge transfer in Technical and Vocational Education and Training (TVET) focusing on the core stakeholders' experiences in Public-Private Development Partnership (PPDP) in Ethiopia and Zambia. The qualitative case study comparatively examines practices and barriers to promoting knowledge transfer in two TVET programmes in Ethiopia and Zambia— both applied a similar PPDP model. The study draws on data generated through semi-structured interviews based on narratives perspective. Key informants were purposively selected from among stakeholders who were directly involved in the two initiatives. The data analysis process follows thematic analysis. The results show that anchoring the PPDP initiatives with the nationally mandated Ministry and broadening coalition with the private sector are critical in transferring knowledge into the national TVET systems. Knowledge transfer through PPDPs is challenged by difficulties of retaining staff the initiatives have invested and partnering with a model school isolated from a TVET system that the PPDP intends to influence. This article points to consideration of local schools' prior experience of delivering similar programmes in order to insert new programmes into TVET systems. In Ethiopia, new TVET interventions are installed in a country and school not familiar with the knowledge field contrary to the programme in Zambia which was built on the existing programme. The successful transfer of PPDP interventions and their sustainability, it is argued, requires implementation of the initiatives with sound knowledge of the local context, and application of adaptive practices that encourage collaboration with diversified and committed local stakeholders.

Keywords: TVET, Knowledge Transfer, PPDPs, Sustainability, Stakeholders



Introduction

The current technological advancements necessitate a change in work organization processes; broaden workforce development and modern work-related skills (Spöttl and Windelband, 2021). As developing countries with an intention to progress towards a technologically advanced economy, Ethiopia and Zambia aspire to adopt complex production techniques that bring about new demands for high skills (Allais and Wedekind, 2020; Arndt et al., 2016; Tezera, 2017). The emerging labour market developments demand new knowledge and skills necessary to sustain industries, their processes and services stimulate significant repercussions on TVET as it has the potential capability to promote appropriate skills and knowledge, which, in turn, can lead to the achievement of sustainable growth (Pavlova, 2019; Spöttl and Windelband, 2021).

Recently, in most African countries, governments put an optimistic emphasize on TVET in the hope that the sector can serve as a panacea to promote technological changes, resulting in better employment outcomes (Oketch, 2014). Although there are promising development efforts in Ethiopia and Zambia, in the recent World Bank report on education in sub-Saharan Africa, the two countries are categorized as emerging but not established economies concerning industrialization, development trajectories, and of educational expansion (Allais, 2020). As a result, both countries have embarked on reforms not only to expand and strengthen post-secondary TVET but also to vocationalising secondary schools (MoESVETEE, 2015; Teferra et al., 2018).

Despite the considerable attention given to TVET (Kwapong et al., 2017), in developing countries, the sector has shown little evidence of success in meeting the changing requirements of producing innovative skills (Allais and Wedekind, 2020). A significant number of TVET graduates lack hands-on experience and have no adequate skills valued in the job market (LeMat, 2020). TVET programmes seem ineffective and have been cited as the causes of slow economic development and unemployment (Ayonmike et al., 2015; Badenhorst and Radile, 2018). Thus, TVET is considered as the 'poor relative of education systems' concerning priority, status, and resources (Campbell, 2015).

Research shows that skills mismatches have become constraints to industrial development and young graduates in Ethiopia and Zambia struggle to join the labour market after graduation (Afeti, 2018; Hagos and Kemenade, 2013). A labour market and sector analysis conducted in 2020 indicates that companies from the construction and manufacturing sectors did not adequately find the right type of workers with the relevant skills in Ethiopia, implying that employees coming from a high skills base to these sectors are not effectively home grown (Capazario et al., 2020). In Zambia, obtaining relevant domestic labour for the big mining firms has not been promising (Mulenga and Chileshe, 2020). Both countries exhibit TVET programmes characterized by inadequate training infrastructure, weak management, poor conditions of services for teachers, shortage of qualified teachers, and inadequate funding (Habtamu, 2016; Hagos and Kemenade, 2013; Mulenga and Chileshe, 2020).

In this light, PPDP can be seen as an alternative approach to enhance knowledge transfer for skills development and transform TVET in contexts with demand for a qualified workforce. The PPDP project is a joint multi-stakeholder pilot-based collaboration among public, private, and international partners, where a non-profit partner implements and manages the project (SIDA, 2020). As a response to the challenges of TVET in developing countries, PPDP initiatives intend to improve knowledge transfer between the private sector (with a need for a qualified workforce),

local government, and schools to sustain better-quality training after the projects have ended. The idea is that TVET interventions through PPDPs can result in replicable features by establishing modern academies and introducing training in modern techniques equipping young people with new technological skills and contributing to sustainability (Moll de Allba and Stucki, 2019).

Using a comparative design, this study focuses on the same PPDP model applied in two different contexts—one in Ethiopia and one in Zambia. The purpose is to understand the experiences at the core stakeholder level in how Public-Private Development Partnership (PPDP) can be used as a tool for knowledge transfer in Technical and Vocational Education and Training (TVET). We focus on understanding how alternative ways of conducting TVET to develop new skills necessary to implement sustainable technology in African countries can be transferred through PPDP interventions to ensure sustainability based on core stakeholder's experience.

We develop the use of narrative approach to illustrate core stakeholders' voices and produce an account of their experiences of transferring PPDP interventions based on their experiences and therefore on meanings that the stakeholders ascribe to what actually happened in their practice of ensuring the sustainability of PPDPs (Asghari and Andersén, 2022). Narratives enable us to identify how core stakeholders work on their experiences and value practices to develop, change, and sustain their collective work (Espedal and Synnes, 2022).

In this article, we are referring to knowledge transfer as the practices put in place to sustain and spread alternative ways of conducting TVET generated through the PPDP interventions to influence national policies and practices in the TVET sector. It involves more than a simple exchange of knowledge or practices but instead emanates from continuous interaction and sustained collaborative work where various actors intersect in the partnership. The purpose of the partnership is not only limited to the exchange of knowledge or practices between actors, but also extends to creation of new-fangled or transformation of existing TVET practices through collaborative work (Gessler, 2017; Warmington et al., 2004).

Knowledge transfer practices and experiences of core stakeholders within the PPDPs and the enabling conditions to sustain and spread the interventions at national TVET systems level are among the overlooked themes in the literature. In the context of Ethiopia and Zambia, research focusing on the transfer of knowledge between PPDPs, governments, local schools, and other stakeholders is limited. For example, the study of PPDP initiatives by Moll de Allba and Stucki (2019), Satolli (2015), and Teffera (2018) focus on project management, effectiveness, and accountability with little emphasis on sustainability and replication of achieved results. Asrat et al. (2022) address issues related to the conceptualisation and experience of ownership among stakeholders within a PPDP initiative. Melesse et al. (2022) analyse the curricular approaches of PPDP-led TVET programmes to ensure the inclusion of students from disadvantaged groups.

Since the PPDP initiatives under study are pilot programmes designed to serve as alternative models of conducting TVET, we analyse how the PPDP model can be used as a tool to sustain these interventions. The study focusses on core stakeholders' narratives in the PPDPs functioning at leadership levels in international organizations, national ministries of education, TVET schools and local companies. The core stakeholders assumed prominent leadership in transferring the knowledge, shaping the adaptation necessary to continually ensure sustainability and thereby influencing national TVET systems. Thus, a comparative analysis of two TVET projects, one in Ethiopia and the other one in Zambia, both stemming from the same

PPDP with the same international stakeholders, is used to understand factors that enable or constrain knowledge transfer within PPDPs.

This article, therefore, addresses the following question.

How do core stakeholders experience knowledge transfer to ensure the sustainability of PPDP interventions in order to use it as a tool beyond the projects' lifetime?

Knowledge Transfer in TVET

Knowledge transfer between organizations and academic institutions is considered to drive innovation (Nigel et al., 2008) and promote the assimilation of new knowledge as well as add value to existing knowledge by stimulating the active engagement of education institutions and the wider community (Hashim et al., 2017). Knowledge transfer has various interpretations (Toepper et al., 2021). De Wit-de Vries et al. (2019, p.1238) describe knowledge transfer practices as activities that facilitate what is needed to bring knowledge into use in another organization's context, such as teaching, the management of interactions and sharing data and technology. Transfer in TVET is defined as the transfer of educational ideas, structures, and practices from one context to another, but can be performed at different levels of a unit of analysis, i.e., national, regional, local, or school level (Toepper et al., 2021). For Marton (2006), transfer implies the way knowledge learned in prior situations is used in other situations.

The above notions of knowledge transfer reflect that transfer occurs at two points of reference, i.e., the source and destination contexts (Gessler, 2017). In view of these facts, we use the concepts «replication» and «adaptation» to problematize knowledge transfer within PPDPs. «Replication» denotes the effort to reproduce identical activities in other contexts, while «adaptation» refers to the modification or combination of practices from several sources (Williams, 2007). This can be done by choosing either to transfer the original knowledge from the source to the recipient (i.e., replication) or customizing the knowledge to fit the recipient's practice (i.e., adaptation). Such decisions determine the acceptability and extent of utilizing the knowledge to be transferred (Law and Kamoche, 2015).

According to Williams (2007), «replication» and «adaptation» cannot be viewed as mutually exclusive, because any «knowledge transfer will usually involve knowledge that requires replication and knowledge that requires adaptation» (p. 867). In most cases, transferred knowledge interacts with the existing knowledge in the recipient's setting. Thus, barriers to replication within such interactions emanate from local peculiarities that demand adaptation.

However, previous research criticizes the narrow conceptualization of TVET transfer as one-to-one export of knowledge. According to Gessler (2017), knowledge transfer should be viewed beyond a copying process. It can be performed as a selective and adaptive process so that it enables partners at the receiving end to easily receive the transfer. A central argument related to this is that the destination context determines the implementation of the process of transferring TVET practices. Integrating an element of TVET innovation entails more than mimic duplication. It takes a process of contextualizing the whole innovation or part of it to fit the conditions of the recipient (Gessler and Peters, 2020).

It is important to emphasize the conceptualization of TVET transfer beyond applying linear portability of knowledge from one task to the other, but also as a transformation that involves

complex social and organizational changes, as well as continuous learning from one activity system to another (Jørgensen, 2011). This article is guided by the conceptualization of knowledge transfer as a «transformation» (Gessler, 2017) and «distributed collective developmental work» (Tuomi-Gröhn and Engeström, 2003) and on the process of changing organizations focusing on core actors' experiences of knowledge transfer within PPDPs.

To understand knowledge transfer, in this study, we analyse the experiences of core stakeholders from two recipient schools—one in Ethiopia and one in Zambia—to better understand the determination of context. Core stakeholders' narratives are significant to understand their practice of transferring the skills in TVET that match sustainable technology in contexts where there is skills gap. To ensure an intervention that sustains the skills within the specific context, core stakeholders need to attend certain adaptive practices (Flynn et al., 2016). However, we take a social constructivist approach to narratives viewing them as «social acts that do not take place in a social vacuum, but in specific social contexts» (Asghari and Andersén, 2022, p.66). It is argued that the narratives of the core stakeholders may not necessarily reflect real knowledge practices occurred in actuality; rather indicate meanings constructed from their perspectives uncovered through interviews (Asghari, 2014; Asghari and Andersén, 2022).

We also argue that the sustainability and spread of alternative ways of conducting TVET through partnerships as aspects of knowledge transfer can be understood as a boundary practice that involves the overlap of several actors. This illuminates the concept of boundary crossing and expansive learning in which various contexts, such as stakeholders within TVET partnerships interact and influence each other by exploring and exploiting their differences (Akkerman and Bakker, 2011; Komulainen and Sannerud, 2018). In the context of partnership, the notion of transfer is related to what occurs when two or more groups/ entities interact with one another across fixed boundaries regardless of the normalized practices of each discrete individual actor. This provides a chance for collaborative learning and the development of new practices by involved parties while also posing a challenge for sustaining productive partnership intervention (Engeström, 2010). In relation to this, Tuomi-Gröhn and Engeström (2003, p. 6) view knowledge transfer as a complex task of distributed work over time and «learning through boundary crossing between various organizational contexts». Transfer as learning through boundary crossing between various entities emphasizes that what has been learned in one context can be adapted in another context. For their collective activity, stakeholders construct a new shared object and apply this object concept in practice. In addition, such an approach should be open to go beyond the existing context and recognize structures and processes, that are not yet present but in the process of being constructed (Engeström and Sannino, 2010).

Gessler (2017) recommends a more cultural approach to TVET transfer, which can be used to explain the interplay of context, actor, and goals as well as transfer attainments. The transfer of practices between various entities and local acceptance of transferred knowledge are more likely to function when there is a significant adaptation to the contextual conditions of the receiving end (Kirkman, 2001). This corresponds to the «element-system oriented transfer» that investigates if the transfer is «valid for any country» (Gessler, 2017, p.74). The element oriented discourse assumes that single components can be inserted into other countries' TVET systems in modified form. However, to successfully install initiatives elsewhere instead of a single aspect introduction of inputs, what is important is the identification of success conditions required for productive and sustainable implementation of initiatives at the systems level (Gessler, 2017).

Previous literature shows, stakeholders within partnership can apply several practices to adapt interventions in the destination context to continually serve the purpose of sustainability. For example, it is necessary to select the right partners in the area addressed by the project. Partner selection is a determinant factor for knowledge transfer to meet its objectives (Duan, Nie et al., 2010) and further, to build mutual trust between the actors engaged (Le Roy et al., 2016). Similarly, stakeholders' decisions to align partnership programmes locally are crucial for enhancing commitment and integrating interventions into the local society and ensuring sustainability and change within the national system (Johansson et.al, 2015). It can also be argued that partnerships should focus on the degree to which the initiatives belong to the recipients. PPDPs can work well when the perspectives of locals are included at the initial and implementation stages (Hardy et al., 2005). It is difficult to sustainably install an intervention if operated independently from local authorities that the partnership intended to influence (Wieczorek, 2018). Close understanding and evaluation of the national and institutional contexts in which the partnerships run, could pave the way for a proximal relationship and affect the collaborative practices in a positive direction (Letaifa and Rabeau, 2013).

The applicability of knowledge transfer in education is also dependent on cross-sector collaboration that could for example mean joint curriculum development and sharing of facilities. This approach of combining practices from several sources can intersect various groups and consider their organic demands (Aring, 2014; Williams, 2007). According to Flynn (2016) a joint production of curricula by educational programmes could produce value for TVET providers, employers, and students.

Lee and Roth (2008) and Dowling et al. (2008) emphasize the need for highly trained human resources and competent teachers for knowledge transfer. Empowering an adequate number of teachers through formal upgrading skills training (Flynn, 2016; Toepper 2021), and peer-based learning (Langelotz, 2017) are important for the new skills to grow, and expand. Concomitantly, ensuring staff development and retention on a local level is important if the knowledge is to remain and develop after the project. The challenge of access to quality teachers, and the loss of staff, is one of the basic threats to TVET-based PPDP.

The Empirical Context

This study is based on the analysis of two PPDP projects— the Heavy-Duty Equipment and Commercial Vehicles Academy (HDECOVA) in Ethiopia and the Zambian Industrial Technology Academy (ZAMITA). Both PPDP initiatives were co-founded by a similar group of transnational actors including the Swedish International Development Agency (SIDA), United Nations Industry Organization (UNIDO), and the Volvo Group in collaboration with local authorities and TVET schools.

The HDECOVA project was set up on the premises of the Selam David Rösceli TVET College (SDTVC), a local non-government organization (NGO) in Ethiopia. The TVET School, which was established in 1989, is part of the school system running from Kindergarten to College level. The principal aim of the HDECOVA project was to improve the supply of adequate skills in advanced commercial vehicle maintenance and increase Ethiopia's youth access to employment through high-tech training.

The ZAMITA project is hosted by the Northern Technology College, NORTEC, a government TVET institute, which was founded in 1964. It was established based on a nationally developed focus on the skills gap for the operation and maintenance of heavy-duty equipment in the mining sector, notably trucks and earth-moving machinery. The ZAMITA initiative aims at assisting young people in Zambia tapping into income-generating opportunities provided by growing mining sector.

In both initiatives that applied the same PPDP model, SIDA has a funding role and oversees project performance, whilst UNIDO takes the role of project implementation, management, and coordination between local and international partners. Volvo contributes in terms of providing resources, technology and experts. Ministries of Education in both cases contribute in terms of reviewing and approving curricula.

The two TVET projects have several replicable features and have successfully setup modern academies and equipped young people with new technological skills in TVET (Moll de Alba and Stucki, 2019).

Table 1: Description of Cases

Context	ZAMITA	HDECOVA
YEAR of Host school Establishment	1964	1989
Number of Students in the College	4682	350
Total number of students attending HER programmes	385	142
Number of Teachers involved in PPDP	19	3
Number of Management	5	4
School Governance	Public	NGO Based
Type of School	TVET College	TVET college in broader school System
Location	Ndola City, Zambia	Outskirts of Addis Ababa

Method

The methodological approach in this study is qualitative, using a comparative case study of the same PDPP model, but applied in two different African countries-Ethiopia, and Zambia. This approach, allows for a deeper understanding of core stakeholders' priorities, choices, and decisions, on a macro system level concerning knowledge transfer through the PPDPs (Yin, 2016). We have applied a narrative approach positioned in this qualitative study, which is useful to incorporate experiences elicited through semi-structured interviews (Espedal and Synnes, 2022; Asghari and Andersén, 2022). Based on stakeholders' told experiences and intentions, it is appropriate to explain how better to tailor PPDP interventions to local TVET systems (Goodrick, 2014).

The two TVET programmes in Ethiopia and Zambia are considered suitable for comparison on the grounds of their similarities, as both are designed based on the same PPDP model, applied by the same group of international actors, but situated in two different national contexts (Bray and Admson, 2007). The two PPDPs also share a common goal of poverty reduction through TVET in Sub-Saharan Africa. Comparative analysis is useful to better understand the reasons why

some successful educational practices work well in one context but not in the other (Phillips and Schweisfurth, 2014).

Participants

In light of the narrative based approach used in this study, a total of 20 participants were purposively selected based on their in-depth knowledge and the appropriateness of their position in the two projects (Patton, 2002). The participants in this study were selected from core stakeholders in the PPDPs. These include individuals who prominently assume top leadership positions in international organizations, national ministries of education, TVET schools, and local companies. Participants at the top leadership levels of the PPDPs were directly included because they were only individuals well positioned in charge of managing and coordinating the TVET interventions and can, influence knowledge transfer practices within the PPDPs. Therefore, the decision to include such stakeholder groups allows the collection of pertinent data for this study and convincing interpretation of these data (Mills et al., 2010). Participants from local companies collaborating with the PPDP projects were selected through snowball sampling (Patton, 2002).

Table 2: Interview Participants

Interviewees	ZAMITA	HDECOA
Education Authorities	2	2
International Partners	3	3
Local Schools Management	3	3
Local Company Representatives	2	2

Procedure

This study utilizes semi-structured interviews for data collection since the main purpose is to develop a deeper understanding of practices facilitating or inhibiting knowledge transfer within PPDP (Patton, 2002). The interview guide contains fixed questions for all participants but allows some flexibility to generate more information from participants, depending on how they explain a specific question. The interview guides were prepared for each stakeholder group.

Participants from international actors were interviewed on Skype or over the phone. However, those representing local schools and government authorities took part in face-to-face interviews. In both cases, the interview sessions lasted from 45 to 60 minutes on average. The interviews for international partners and ZAMITA staff were held in English, while for local actors at HDECOVA Amharic—the federal government working language in Ethiopia— was used, and later transcribed into English.

Analysis

The data analysis process as suggested by Yin (2016) follows a thematic analysis to examine the perspectives of study participants and identify the similarities and differences between themes, as well as to produce a clear and organized data set and report. The data targeted were those

that aligned to the research question under study. The coding process was data led, whereby related segments of text from the transcripts were obtained from the recorded interview data. This implies that analytical themes were drawn from the perspectives of research participants. First, we separately read through the interview data and identified identical themes that were assigned to our initial set of codes. We then repeatedly read through the data from each stakeholder group line-by-line to come up with detailed codes. Next, codes were condensed and the overall relationship patterns between themes were established and analysed resulting in four themes that were analysed in line with the research objective.

Ethical Considerations

The study is carried out according to the ethical standards of Good Research Practice (VR 2017; codex.vr.se). To maintain ethical research principles, interviews were digitally recorded based on the willingness of each participant, with the exception of one participant from the local school in Ethiopia. The participants in the study were kept anonymous and were informed about the confidentiality of their participation before the interview started.

Concerning the positionality of the researchers, the contributors in this study are external (Chavez, 2008) to the projects under investigation, so there is detachment from the participants and the PPDPs community. The researchers have neither the experience of previous employment nor current membership in either initiative.

Results

The results of the findings relating to knowledge transfer within PPDP are categorized into four major themes: 1) Partner selection and prerequisites, 2) Staff development 3) Staff retention, and 4) Collaboration.

Partner selection and Prerequisites

«Partner selection» as applied in this study; refer to decisions and priorities of core actors regarding which type of schools (Public/private/NGO) to work with to host the PPDP TVET programme. In addition, the theme «Prerequisite» refers to certain conditions related to the characteristics of the existing schools and respective programmes, considered by partners to start, develop, and operate the PPDP-led interventions.

Interview results suggest that the sustainability and insertion of PPDP interventions depend on institutional proximity and interdependence of the training host school with the TVET system. The choice of an NGO-based school was challenging for HDECOVA, because it meant compromising between the goals of achieving quality and ensuring sustainability and scaling up of the PPDP. International partners believed that a renowned NGO-based school was preferable because of its quality and institutional readiness. Collaboration with a public school was seen as problematic for sustaining and transferring PPDP outcomes.

The academy is hosted by an NGO-supported reputable school assuming that it would have been risky to collaborate with a weak and inefficient government structure of the public TVET colleges if the innovation was to sustain and scaled up.

However, the decision to choose an NGO school operating independently of the government system has made the insertion of the PPDP experience into the TVET system difficult. A participant from HDECOVA argues:

It is difficult to install change into the national TVET system as the change comes from outside the public sector /.../ SDTVC exists in isolation from the government it is intended to influence; hence, it is a challenge to share best experiences.

This implies that it is not only the specific local school's readiness in bringing new TVET practices that may be important, but also its interdependence with the national school system when it comes to scaling up best practices on a national level.

Regarding ZAMITA, the choice of a public school is recognized as rewarding, as it helps in sustainability and replication. A ZAMITA staff member reiterates: « If NORTEC keeps integrating the new PPDP components into their existing plan and acts accordingly, the risks related to institutional sustainability become low as they have also the experience to run heavy duty mechanics programme».

In this regard, the active engagement of the government was an important factor to secure sustainability and replication of the PPDP intervention. According to a participant from ZAMITA: «Working with a flagship public institution can provide a wider impact on project success and can enhance the involvement of the government directly as a contributing partner /.../». Efficiency is also a major driver for ZAMITA to work with a public institution. A participant states:

NORTEC was the best choice because it seemed not in need of major renovation of infrastructure, as it has sufficient space for expansion and development offering the private partner an opportunity to effectively utilize the funding, thus helping in cost minimization.

Some prerequisites are especially important to attend to before partner selection. According to a participant, the HER course is a flagship programme at NORTEC and does not represent completely new skills: «the diploma level programme builds on the already existing but less advanced programme». A NORTEC participant: «The new programme is welcomed as it creates an opportunity to renovate the curriculum, upgrade teachers and refurbish our workshops».

The diploma programme is viewed as an improvement at ZAMITA, signalling evidence of the adaptive practice of the new knowledge building on prior experience in similar training. Ironically, the PPDP at HDECOVA resulted in Ethiopia's first modern academy and represents completely new skills, because previously there was no specialized HER programme. The PPDP in Ethiopia generated new curricula, occupational standards, and assessment tools filling gaps in policy and curriculum. «There were no guiding national curricula and occupational standards for HER. Even if there has been a demand, no one has taken the initiative to start the programme at any of the TVET colleges/.../».

Because of the novelty of the programme in Ethiopia, HDECOVA primarily focuses on the provision of a level-based programme, in contrast to ZAMITA. HDECOVA allows direct entry from secondary schools; however, ZAMITA welcomes mature students with previous work experience as confirmed below: «/.../ most students attending aged between 17 and 20 years/.../ there is a huge demand by secondary school completers to join the regular programme». This is in line with the strategy to train young students, most of whom do not have previous work experience in field of work.

Another specific prerequisite of both PPDPs is language where HDECOVA offer courses such as English and workplace communication. A participant from HDECOVA describes:

The language barrier is one of the challenges in the training. Most of the trainees do not speak English and others are shy about communicating in English. Our intension is at least to equip them with skills to effectively communicate at the workplace.

The findings suggest that replication of new knowledge is evidenced at HDECOVA as new TVET interventions are installed in a country and school not familiar with the knowledge field.

Staff Development

Another theme from the data is «staff development», which refers to choices, approaches and undertakings in place within the PPDPs, to empower local teaching staff, which could be helpful in sustaining and expanding new ways of conducting TVET from PPDPs.

Professional development for teachers is found crucial to meet the goals of the PPDP. HDECOVA offers staff upgrading courses in various modalities as a participant states: «Teachers now possess industry-standard skills through subsequent technical training offered /.../ in Dubai and Sweden /.../ and through e-learning platforms/.../ competence and pedagogical training are also provided at home».

Participants from ZAMITA provide positive feedback on the staff development programme as shown in the following statements:

Teachers are very motivated because ZAMITA has brought a new dimension on the part of teachers and students in terms of the mode of presenting lessons. I am confident that I can teach based on the knowledge from specialists on the latest equipment.

Once the standard of the teachers has been raised, it means that students will also receive best practices. To produce students with relevant skills for industry, teachers' empowerment programmes play a significant part in upgrading and transfer of skills.

The variation between the two initiatives is that staff development is more comprehensive and systematic in the case of ZAMITA and is built on former staff knowledge. Here, staff exchange is common between the industry and other schools. A NORTEC management member states: «Teachers frequently undertake industrial tours in related industries to broaden their outlook, experience, and keep up with the latest development in technology». The above point is shared by a ZAMITA staff member: «Staff exchange is at the centre of our excellence. The academy welcomes and empowers teachers from neighbouring schools. Company employees take short-term training».

In both cases, representatives are satisfied with advanced skills training using modern equipment. However, there is little evidence of staff exchange, knowledge-sharing forums, or industry tours at HDECOVA. Teachers attended specific training sessions at a centre in Dubai, on e-platforms, and at the local school, but did not develop the same networks locally as teachers at ZAMITA.

Staff Retention

This theme refers to the challenges related to retaining staff, as well as efforts and mechanisms put in place by the PPDPs to access adequate and competent teachers and to reduce staff attrition, in order for knowledge to remain in the schools.

A problem at HDECOVA regarding staffing, is finding well-qualified and experienced teachers. Those available also have a little experience in the industry. As shared by a participant, inadequate access to well-experienced teachers in heavy-duty mechanics in Ethiopia poses a challenge to the sustainability of the PPDP.

The biggest challenge that we have is getting the instructors. The instructors that we hire now are just fresh graduates and so they are students themselves. /.../ we cannot elevate them to the necessary level of teaching competence in a short time /.../ retaining them is also another challenge. If we can hire and retain a senior staff that would make a difference.

As mentioned above, the PPDP in Ethiopia is unable to retain highly skilled teachers, as they are easily recruited by other companies. Part of the issue is due to the poor payment structure at HDECOVA. A participant from the international partners underscores: «Every teacher that we invest in leaves for the private sector because they get better jobs with attractive salaries». A participant from HDECOVA confirms that staff development by the PPDP makes them attractive to the private sector. «The excellent quality of teachers who receive staff development training makes them highly valued in the job market /.../»

Another participant underscores that the perpetuation of staff turnover could threaten the sustainability of interventions: «If staff turnover is left unresolved, it becomes a loss of knowledge and can lead to discontinued learning and affects quality training and scaling up to other schools».

By contrast, the project in Zambia is better at employing and retaining highly skilled teachers with experience in the mining industry. This is because of better recruitment and retention strategies implemented.

We recruit well-qualified and well-experienced teachers with previous work experience in industry and from the teaching profession. So long as an ample number of qualified teachers are available in the program, we move more than halfway to sustain the program.

In addition, as learned from participants, ZAMITA commits to attracting teachers and making them stay in the academy. A member of management staff maintains: «investment in teachers' competence and development in new technology, is not enough unless we retain them».

Collaboration

The theme «collaboration» refers to the degree to which the PPDPs collaborate with local authorities and other organizations in their effort to mobilize stakeholders to emulate the PPDP interventions and thereby installing the intervention into national TVET systems beyond the projects' lifetime. Both programmes must also ensure that high-quality practice-based training is available for students by collaborating with local companies.

However, there are differences regarding the decisions with whom to collaborate among local stakeholders. Participants from HDECOVA express their views in facilitating strong in-company training for students: «/.../ not seen cooperative training that has been used in a form as extensive as that of HDECOVA/.../ good lesson that students have practical training in the workplace after completing each module». There is also experience in workplace training at ZAMITA. A respondent explains: «A network was formed with mining companies /.../ Agreements were signed to facilitate educational tours and internships, career talks by members of company staff /.../»

ZAMITA employs strategies to facilitate collaboration with local companies for student placements and graduate employment and an office has been set up connecting the academy with local companies: «Combining training with exposure to the world of work through internships and apprenticeships makes NORTEC renowned, and to facilitate this, we have established a career service department». However, ZAMITA has problems of broadening private sector coalition. A participant describes: «Due to the huge investment in the mining sector, ZAMITA prefers to work with a narrowly enclaved sector /.../»

From the above, the project in Zambia needs to identify and collaborate with stakeholders from various sectors, to diversify opportunities for programme sustainability. HDECOVA has better experience in diversifying stakeholders from transportation and construction companies to mining, agriculture, and military sectors. «The academy approached several companies from various sectors through the channels of the Ethiopian Chamber of Commerce and Sectoral Associations».

It was a failure not to anchor the Ethiopian programme with the Ministry of Education (MoE). However, they seem to collaborate with the Chamber of Commerce in a creative way.

It is strange that the project is overlooking the Ministry of Education and the TVET agency. Effective follow-up and evaluation are crucial to bringing the desired change. In my view, the MoE failed to do so because it does not legally belong to the partnership. /.../ I feel that there is no mandated ground for the authorities to scale up project best practices.

As the example shows there are challenges when excluding public schools, as the MoE shows little commitment to implement the initiative on a larger scale. For example, «I think sense of ownership is missing that is why it took three years for the Ministry to approve the curriculum», a project staff member remarks.

The MoE also shows reluctance to upgrade the academy to a polytechnic college level. A management staff member comments:

There is pressure on the academy to provide training of trainers to teachers in other schools but SDTVC is not upgraded to a polytechnic college, to legitimately provide a teacher training programme and serve as a centre of excellence.

The difference between HDECOVA and ZAMITA in their collaboration with the government can be exemplified by the response below: «The government is committed to expanding the academy activity to ten more colleges across Zambia through the provision of relevant equipment and technology transfer training». This implies a «replication light», a way to realize changes at the national TVET system level. A participatory approach was adopted in both cases when developing TVET curricula as illustrated below:

Contents for the new level based HDECOVA curricula were developed by taking the perspectives of various sectors.

Our involvement in curriculum development (ZAMITA) was helping to develop a competence-based qualification framework and modern curriculum to address the gap between employing companies' expectations and current educational standards for the mining sector.

The co-creation of curricula reflects one important collaborative practice of the PPDP model. The new curricula as final products of PPDP interventions developed by including diversified perspectives can be viewed as typically responsive to the demands of stakeholders.

Discussion

This study aims at understanding core stakeholders' experiences of the PPDP as a tool for knowledge transfer in new TVET-skills. This is to increase sustainability and integration of new skills beyond the projects on a national level. Here, adaptive processes in knowledge transfer are especially important for the PPDP, because the integration of new skills with former knowledge in the destined context determines the implementation of the new skills (Gessler and Peters, 2000) and by this the sustainability of the PPDP. This study also tries to identify some of the barriers to knowledge transfer within the initiatives.

Adaptive processes in knowledge transfer are not to be seen as mimic duplication of information. Instead, actual adaptation approaches in transfer build on joint selection and adaptation of ideas, processes, and structures necessary to serve the goal of sustainability. A closer look illuminates the importance of identifying success conditions to seamlessly install initiatives in the destination context (Flynn et al, 2016; Gesseler, 2017). Integrating new TVET skills means that these skills need to interact with existing knowledge in the context of the recipient (Williams, 2007). To accomplish organizational changes and continuous learning between activity systems (Jørgensen, 2011) the members of the PPDP need to collaborate. When initiating collaborations, the first question is whom to collaborate with? This requires an adequate understanding of local peculiarities, because local context shapes the sustainability of an initiative (Yamey, 2011), and choosing the wrong partner could harm the alliance (Kang et al., 2019).

Partner selection became a dilemma for the PPDP in Ethiopia in comparison with the initiative in Zambia. The choice of a private NGO-run school was considered logical, given that the school has a reputation for providing high-quality practice-oriented training. The reason for not partnering with a public school was also a worry for an ineffective and inefficient governance system. This worry seems reasonable from previous research by Oketch (2014) who points out that governments in developing countries lack the ability to support and provide functional and quality TVET.

However, the PPDP-programme in the NGO-school in Ethiopia became isolated from the TVET system that it was intended to influence. Even though the new way of conducting TVET works well within HDECOVA, the isolation does not stimulate adaptation or replication in a larger, national context. It is not only the school's readiness and reputation that is important, but also the interdependence with the country's TVET system to facilitate the insertion of the PPDP intervention beyond the project. This is consistent with what Wieczorek (2018) argues that partnership interventions implemented in isolation with governments and authorities, cannot achieve transformative and sustainable effects.

In contrast, the experience in Zambia reveals that a reliable partnership can be forged with public-TVET colleges. Due to the selection of a public school, the insertion of the PPDP approach into the TVET system increases the practices at governmental levels in Zambia. Therefore, working with a public college might help to enhance the possibility of knowledge transfer by PPDPs on a national level. If governments do not differentiate between public and private schools, choosing a private school does not need to be a problem. Therefore, knowledge of the local context and the government's relation to public/private schools is important to ensure knowledge transfer (Letaifa and Rabeau, 2013).

Linking the new skills programme locally in the TVET systems is a necessary practice to facilitate knowledge transfer within a PPDP, and ensure continuity beyond project life (Johansson et al., 2015). In the case of HDECOVA, anchoring the TVET intervention with public authorities was one of the major challenges of collaborative PPDP practices. The fact that the MoE in Ethiopia was not part of the main PPDP from the beginning, the authority shows poor commitment towards transforming the project school into a centre of excellence for teacher training, and could have served as an epicentre to further distribute best practices to other schools (Moore and Birkinshaw, 1998). The approval process of the new curricula with the Ministry also took a substantial time. However, there was strong commitment and readiness from the MoE in Zambia to support the project, as they were actively engaged in the partnership from the beginning. The collaboration with government authorities has the possibility to facilitate knowledge transfer at a national level, so that the PPDP becomes a tool to accomplish sustainable effects and ensure integration into national TVET systems.

Broadening the collaboration between TVET institutions and local industry also needs to be in place to diversify, for example teacher development, students' competence, and sources of apprenticeship, funding, and employment. The skills development in ZAMITA with staff exchange, industry tours, and knowledge sharing programmes between teachers and company staff, indicate that local level collaboration between management and companies are extensive. This facilitates adaptation by linking schools and companies when new skills are integrated with previous knowledge by alternating learning places and the knowledge sharing between teachers and company staff. This study supports previous research and points to the importance of stimulating this kind of collaboration (Pillay et al., 2014; Toepper et al., 2021). However, as ZAMITA seems to build a close relationship with the narrowly enclaved local mining sector, HDECOVA in Ethiopia approaches a much broader sector of local companies. Working with a single private sector could be a challenge to knowledge transfer of the new TVET skills, as it lessens potential private forces that could emulate the PPDP initiatives and engage in similar projects with other TVET schools.

Adaptation also needs to attend to the prerequisites of schools' local experience. In Zambia the project was built on already existing knowledge based on local demands and this facilitated the adaptive processes in knowledge transfer. The new programme could be integrated by further refurbishing the already existing resources, upgrading the quality of teachers, and renovating curricula. In Ethiopia there was no such prior experience. The programme resulted in a completely new programme. Implementation of the PPDP faces a greater challenge if the purpose is to adapt new knowledge, and schools are not previously familiar with the knowledge field. This made the capacity of the Ethiopian school more fragile when it comes to sustaining the new skills on a local level (von Krogh and Roos, 1996).

The PPDP in both Ethiopia and Zambia provide comprehensive TVET programmes combining theoretical in-class and hands-on technical training with soft skills training, which are failures in many TVET systems in developing countries (Ugochukwu et al., 2020). According to Card et al. (2015), combining TVET programmes with other services attached, are more likely to yield improved outcomes. However, to benefit from soft skills training another prerequisite may be necessary, and this reveals a problem for the Ethiopian programme. A language barrier became visible in soft skills training where the trainees were shy about communicating in English and others did not speak the language at all. The TVET-programme in Zambia did not face the same

difficulties in this regard. Students could progress to more advanced levels from the soft skills training. From the experiences of core stakeholders, the PPDP shows a difference as HDECOVA embeds soft-skills courses into the curricula, while ZAMITA offers such training in the form of short courses through the career development office. Language problems seem to be one barrier that future PPDP projects need to attend to.

One significant influencing condition to successful transfer is the competence and expertise of teachers. Especially, the availability of staff with sound understanding of how the new intervention works plays a paramount role (Dowling et al., 2008; Toepper, 2021). Staff development is a core priority in PPDP projects because the heart of sustaining TVET interventions is the teacher. Efforts were made in both schools as teachers were offered industry-standard technical and pedagogical training locally and abroad, but the results show a variation in staff development, where ZAMITA is more rigorous and systematic than HDECOVA. ZAMITA heavily engages in facilitating staff exchange, knowledge sharing and industry tour programmes between teachers and company staff, which may lead to the teaching staff in Zambia more transparently express self-efficacy in teaching. At HDECOVA, there is an absence of these very positive statements regarding staff development. The training abroad and courses online for the less qualified staff in Ethiopia corresponds to the approach of replication, where the context with former knowledge did not interact with the new skills presented by the PPDP. On-line produced courses can be built up from simple to more advanced tools of learning but do not necessarily give room for interaction and integration between new and former knowledge. As education is inherently local, digital courses can work well when interplayed with the specific contextual knowledge and the new skills to be learned.

We, therefore, suggest that staff development in PPDP-led TVET should be characterized by adaptive processes where specific context and former knowledge are considered for each specific individual. When new skills are introduced, it is significant to promote knowledge sharing between teaching staff at different schools, as well as with professionals at local companies, as in the case of ZAMITA. As stated earlier, if new knowledge is significantly adapted to the contextual condition the more successful will the transfer be (Kirkman, 2001).

Staff retention is a major challenge at HDECOVA in Ethiopia, compared to ZAMITA in Zambia. HDECOVA has, as in other countries with significant skills gaps (Maurer et al., 2011), problems with low staff salaries. When staff become fully trained they leave for better paid work. However, it is not only salaries that can promote staff retention. One important factor is to implement strategies to continually develop staff and by this motivate them. The staff at ZAMITA seem to experience motivation and self-efficacy, due to continual upgraded skills training sessions, industry tours, staff exchange, a critical number of colleges to share with, and the recruitment of well-experienced teachers. Pitose (2013) suggests that continuous skills upgrading, paying comparative salaries, providing adequate support systems, and manageable caseloads, need to be put in place to avoid staff loss. Otherwise, when staff leave, as in the case of HDECOVA, knowledge leaks, and it will be much more difficult to reuse acquired knowledge, which will risk the sustainability of the PPDP.

Conclusion

Core stakeholders within PPDP projects make an important impact on the promotion of knowledge transfer. This study suggests that core members of the partnerships should concentrate on promoting adaptive processes, where the new TVET skills are integrated in specific context with former knowledge. To achieve this, it is important to anchor the PPDP with national and local authorities, so the necessary condition for the sustainability of the project is optimal and the new skills are more likely to spread into national systems.

Furthermore, collaborative practices between equal and committed stakeholders at all levels are important in sharing, as well as linking, the specific context and knowledge to the new skills. PPDP stakeholders should consider the effects of failure to collaborate with relevant local authorities and a diversified private sector. If adaptive practices from several sources are encouraged, such as a joint curriculum, cooperative training and staff development, commitment might increase among teachers and inhibit problems of staff retention. Here, it is important that a critical number of well qualified teachers (Flynn et al., 2016) are strengthened in their peer-based learning (Langelotz, 2017) for the knowledge to sustain, grow and spread at local level, when the PPDP project has finished.

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