Chapter 8. Models for Designing, Developing and Delivering TVET[1]

This chapter presents an overview of the TVET models that are discussed in the research literature, and looks at issues relating to them. This includes aspects of the design, development and delivery of TVET, including pedagogical or programmatic proposals (RQ7.a, RQ7.d, Chapter 4.3.). We also consider the characteristic dimensions of TVET, such as the cooperative dimension and the temporal dimension (distance learning, blended learning, collaborative learning, in-service, work-based, school learning, RQ7.b / RQ7.e, Chapter 4.3), as well as the two dimensions of formality (formal vs. informal) of teaching and learning (RQ7.c, Chapter 4.3). This discussion necessarily requires the repetition of some elements from the presentation in Chapter 4.4.1. and in Chapter6.

Research questions considered in this chapter

The research questions considered in this chapter are listed in the box below.

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Research questions considered in this chapter

RQ7. TVET models that are discernable in the literature; the **main lessons** in designing, developing and delivering TVET models.

[RQ7.a] What **pedagogical or programmatic designs** are researched in the literature? Which models of TVET are used (or planned) in SSA? For example: distance learning, blended learning, in-service, pre-service (college), work-based, school-based, formal vs. informal.

[RQ7.b] What are the **key features** related to designing, developing and delivering TVET models?

[RQ7.c] Is the **formality of TVET education and TVET education programmes** (formality vs. informality) in each context a differentiating feature?

[RQ7.d] What **pedagogical / classroom approaches** are being used to deliver TVET?

[RQ7.e] Are the **practical components** of programmes a factor that makes them stand out in any way? (For example: cooperation between college and business as places of learning.) Are there already dual approaches that have been considered? Is the degree of practical components (e.g., cooperation school-enterprise) in each context a differentiator?

Conclusions of this chapter

Since a practice-oriented TVET approach is favoured across all studies, we classify those TVET models currently being used according to their degree of practice-orientation (cooperative dimension). We divided them into three different categories: Type K1 Models with a predominantly theoretical profile and little practical experience, Type K2 Models with approximately 70% workplace-based activity and 30% of activity at a devoted learning centre, and Type K3 with almost entirely workplace-based education.

We identify examples of alternative models of TVET that highlight the ways in which the aforementioned models could be enhanced. Firstly, distance learning models highlight the use of ICT in TVET, evidenced in several settings (e.g., in Uganda, Nigeria, South Africa, Gambia).

Additionally, CPD and in-service approaches also emerge in the literature, including short-term courses on current topics, mentoring-based courses, informal literacy courses to increase the educational maturity in the informal sector, and multiplier models. Such approaches can be used to make TVET more relevant to the working environment, without utilising drastic system-change-type transformations.

A discussion of pedagogical approaches employed in TVET follows. Whilst non-interactive approaches are still commonplace, interactive and ICT-enhanced pedagogies are regularly emphasised. Findings relating to practical training suggest that greater emphasis must be put on practice-focused educator / teacher professional development. This was identified across multiple sectors, multiple types of courses and for both the formal and informal sectors. The aim – this is explained in several of the studies

– should be to offer an interactive TVET in which authentic practice-relevant tasks are solved. The large informal education sector must also be included. As with the other chapters, the subsequent sections offer additional details of the points discussed in the summary above.

8.1. Programmatic and pedagogical designs

This section considers programmatic and pedagogical designs (RQ7.a). The literature indicates that a number of programmatic designs are being employed in SSA. Broadly, initial TVET approaches can be categorised by the extent to which they involve practical components (cooperative dimension). For congruence with the German version of this report, we use the letter 'K' with reference to the German term 'kooperativ'. Doing so, we obtained three overlapping models: K1, K2, K3.

1. **Type K1.** Formalised college-based courses (focusing on theoretical teaching, with, for example, the vast majority consisting of theoretical lessons (say 80%) and a small amount of workplace learning (say 20%, in or outside the college). The K1 approaches are predominantly to be found in the health sector (evidenced in South Africa, Cameroon, Uganda and Kenya).
2. **Type K2.** Formalised, dual-system approaches (involving approximately 70% workplace-based activity and 30% of activity at a devoted learning centre, following the proportions identified in Ethiopia (↕Ethiopia: Krishnan & Shaorshadze, 2013). Type K2 models aim at college-based education with a large practical component (at times equivalently weighted), and share aspects with dual systems. Such models have been tested by many SSA states (Ethiopia, Mozambique, Mali, Malawi, Botswana, Tanzania), but as yet have not been implemented at larger scales.
3. **Type K3.** Apprenticeship-only approaches (which are almost entirely workplace-based, with little or no theoretical component). Type K3 models encompass informal education and can be found across SSA. As a rule, they consist entirely of informal work-based training situated almost exclusively at the workplace. Although this form of TVET is well established in many settings, it is often poorly recognised and not included in TVET policy.

Overall, these three types correspond to different points within the cooperative (transversal) dimension (Chapter 4.4). On the formality dimension, Type 3 designs could be categorised as both formal and informal, depending on both the formality of the TVET sector (whether relevant to a government- regulated economy or the grey economy) and the formality of TVET provision (Chapter 4.3). Any of these types could be expansive or restrictive definitions of apprenticeship (Chapter 4.4.1). In addition to types K1, K2 and K3, the analysis of U-literature suggested two more categories (Z4 and Z5) that are related to both the cooperative and temporal dimensions:

4. **Type Z4.** Technology-supported distance learning (both initial and in-service);
5. **Type Z5.** In-service approaches and continuing professional development (CPD).

Here the letter 'Z' refers to the German term 'Zeit'. Naturally, this list does not cover all possible approaches. However, those five models (K1, K2, K3, Z4, Z5) occur most frequently in the literature.

8.1.1. Examples of formalised, college-based courses (Type K1)

Formalised theory- and degree-based K1 approaches (evidenced in South Africa, Cameroon, Uganda and Kenya) were frequently considered in the literature that we surveyed. Various examples within numerous sectors have been found, some of which we provide further details of here.

For example, in the health sector, there is a four-year course (involving one year of basic science and three years of professional studies) for pharmaceutical workers in South Africa (↟South Africa: Summers, et al., 2001). Similarly, within the education sector, formalised approaches are also commonly evidenced. This is, for example, true of initial teacher education ('ITE') with a duration of one to three years in Cameroon (e.g., ↟Cameroon: Wohlfahrt, 2018; see also, ↟Uganda: Tukamushaba & Xiao, 2012), as well as of additional courses at state, private or church vocational schools, e.g., in Zimbabwe (↟Zimbabwe: Samkange, 2013). Pupils who aspire to an agricultural education ('ATVET', 'agricultural technical and vocational education' (↟Ethiopia, Benin: Walker & Hofstetter, 2016), or who would like to work in the tourism sector (↟Uganda: Tukamushaba & Xiao, 2012), can also generally take advantage of formal, vocational school offers. This also applies to many skilled trades. Approximately 150 rural craft schools in Cameroon offer two-year courses in carpentry, pottery, masonry and agriculture (↟Cameroon: Che, 2007).[2]

In Zambia, teachers and managers can attend formalised, theory-based programmes in the field of TVET. The basis for these offers is a collaboration between the University of Bolton (UK) and the Ministry of Science, Technology and Vocational Training (MSTVT; ↟Zambia: Smith, 2010).

8.1.2. Examples of formalised, dual-system approaches (Type K2)

Within the U-literature, approaches labelled explicitly as 'dual approaches' were discussed in only three instances. National-level, dual-system approaches are currently evident in Ethiopia (↟Ethiopia: Krishnan & Shaorshadze, 2013) and Mozambique (↟Mozambique: Sandirasegarane, et al., 2016). At the programme level, an explicit dual-system approach was only considered in one instance: Malawi (↟Malawi: Safford, et al., 2013). Additional evidence for dual-system-type approaches are available for Mali and Botswana (↟Mali: Kingombe, 2011; ↟Botswana: Galguera, 2018). Company-based TVET is also reported to form a key component of TVET education in Uganda (Uganda: ↟Bananuka & Katahoire, 2008). We note that aspects of Type K2 are also discussed in Section 4.4.1. The

2 In 2007, rural craft schools operated in a nation that *"does not have a government-controlled dual track system for general and vocational education"*. No further information on the model specification of the craft schools is provided (↟Cameroon: Che, 2007).

discussion below necessarily requires the repetition of some elements presented in those sections.[3]

Status of the dual system in Ethiopia

According to a study by Krishnan and Shaorshadze (↑Ethiopia: Krishnan & Shaorshadze, 2013), Ethiopia is interested in applying dual models for TVET at least partially, tailored to its own national context.

> *"TVET students in Ethiopia have to apprentice 70% of the time spent in the programme"*, with TVET colleges *"tasked by the government to identify potential employers who can provide apprenticeship experience"* (↑ibid.:18).

While this article acknowledges that the German dual system is internationally admired, it reports that a

> *"challenge in implementing the dual system is that a company has to be convinced that participating in the apprenticeship scheme is ultimately to its own benefit"* (↑Ibid:7).

This is reflected in Ethiopia, where despite successes in engaging (often government-based) employers from particular industries, *"other companies resist [participation] and see TVET apprentices as a burden"* (↑Ibid:18). This was reflected in the differing responses from interviewees who were members of public and private organisations. While public enterprise leaders *"expressed satisfaction with the TVET system and the quality of its graduates"*, a manager of a large private company stated *"that he would not participate in the apprenticeship"* and was even opposed to hiring TVET graduates in some instances. People who were not dual-trained were, in his opinion, *"less expensive and less liable to be 'poached'"* (↑Ibid:18).

Status of the dual system in Mozambique

At the Universidade Pedagogica in Maputo, technical teachers are trained to provide work-related instruction at technical colleges. However, this cannot quite be equated with a dual approach. Overall, information on developments in Mozambique is sparse. Looking at the available research reports that can be found online, it becomes clear that Mozambique

> *"runs a dual vocational education and training programme as a culmination of elementary and secondary-school TVET programmes"* (↑South Africa, Guinea: Sandirasegarane, et al., 2016:108).

Grade 6 pupils spend

> *"three years in limited practical training for a profession and then another three years in more advanced theoretical and practical training"* (↑ibid.).

3 The term 'apprenticeship' can also refer to the practical component of formalised dual-system approaches (c.f. Ethiopia; also the German dual system, i.e., Type K2).

Students in Grade 10 enter a four-year educational training programme (↑ibid.). As in Ethiopia, the level of success is limited; these programmes are beset by problems including inadequate funding, inadequate provision of specialist educational or technical instruction – neither of which are at an internationally recognised level of knowledge, and dated curricula (↑Mozambique: Mucauque, 2010).

In 2010, Mucauque published far-reaching proposals in his dissertation for reforming vocational training in Mozambique which were yet to be implemented (↑ibid.). Overall, the information on developments in Mozambique is sparse.

Status of the dual system in Malawi

An apprenticeship programme for women in rural areas reportedly possessed *"dual academic–vocational components"*, through its delivery of *"simultaneous access to work, access to study and opportunities for reflection on learning"* (↑Malawi: Safford, et al., 2013:197). The Malawi Access to Teaching Saltire Scholarship (MATSS) scholars work four mornings per week as classroom assistants in rural primary schools, then revise for their school teaching certificate for the rest of the working day (priority subjects: mathematics, physical science, biology and English).

This is similar to the project for training school assistants, which is also common in the Federal German state of Saxony (graduates with a technical degree or a master's degree in technical professions already work as assistants to vocational school teachers at a vocational school during their teacher training studies at the TU Dresden.[4]The Malawian classroom assistants receive a bursary, have access to highly structured distance study materials for work experience and for academic subjects, and are mentored by experienced practitioners (↑Malawi: Safford, et al., 2013). The programme began in 2011 with two cohorts each working with 500 women across four districts. A detailed account of this programme's implementation can be found in the conference paper of ↑Wolfenden and colleagues (2011). Further details on this programme are provided below.

Status of the dual system in Mali

A much-cited report provides insight into the dual system in Mali (↑South Africa, Ethiopia, Benin, Cameroon, Angola, Senegal, Mali: Walther, 2008, summarised in ↑de Largentaye, 2009, and ↑Sierra Leone, Mali: Kingombe, 2011). According to ↑Kingombe (2011),

> *"in Mali, the effort to address the needs of the real economy has led to support a [...] dual training system"* (↑ibid.:37).

This system was formally introduced in 1997, and combines apprentices' work being supervised by a trained artisan (80% of the time) with formal courses in TVET centres (20% of the time). Despite the evaluations showing significant improvement of skills, as well as its contribution to social inclusion and an improved employment rate, the scope of the dual system in Mali remains small:

4 ↑Staatsministerium für Kultus, Schule und Ausbildung, *available at* https://www.schule.sachsen.de/23756.htm

> "*with about one thousand apprentices graduating every year, as compared to the 300,000 or so entering the labour market*" (↑Sierra Leone: Kingombe, 2011:38).

To scale up the dual training system in Mali, de Largentay has a variety of suggestions, such as better control of costs per annum and the implementation of a proper training certification system (↑Mali: de Largentaye, 2009).

Status of the dual system in Botswana

In Botswana, an attempt was made at the end of the 1980s to introduce dual approaches with the support of the (then) Deutsche Gesellschaft für Technische Zusammenarbeit **(**GTZ, now the Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ). However, it appears that the introduction was less successful than expected (↑Botswana, Namibia: Galguera, 2018). Galguera states that Botswana

> *"failed in its adoption of the German dual system due to its weak industrial base at that time"* (↑ibid.:108).

Wilson writes that efforts to develop a TVET-friendly corporate culture in Botswana have failed, and that it has been impossible to achieve the level of integration of the elements of the German system (i.e., collaboration with social partners and companies) (↑Botswana: Wilson, 2000).

8.1.3. Approaches to TVET entirely at the workplace (Type K3)

Apprenticeship models of Type K3 were frequently referenced in the studies we considered. This model plays a large role across SSA, particularly in the informal sector. For example, in Uganda, it is an important part of TVET (↑Uganda: Bananuka & Katahoire, 2008). According to Hanson, most workers in Ghana in the informal sector learned their trades in this manner (↑Ghana: Hanson, 2005). He writes that the role of apprenticeship programmes goes beyond professional education, because of their *"remarkable blend of work, practical training and moral upbringing"* (↑ibid.:167). We note that the notion of *"moral upbringing"* is not defined in more detail, and should be viewed critically.

Informal learning also takes place in the training of future traditional ophthalmic practitioners in Nigeria (↑Nigeria: Ebeigbe, 2013). These were found to be organised in a predominantly informal manner, with 46% of apprentices being trained through father-to-son tutelage and 37% learning from relatives (↑ibid.). Only 18% of these apprenticeships possessed what might be considered as more 'formal' characteristics (specifically, a signed agreement and payment of money to the apprentice) (↑ibid.).

Another example of informal TVET in the informal economy is the training of potters – starting in childhood – in Cameroon (↑Cameroon: Wallaert, 2008). Through a multi-stage observation, and repetition-dominated processes, the apprentice completes her training when she reaches 15 years of age. Subject to an initiation process and the apprentices' engagement to a future husband, this point is

> *"marked by a celebration that implies that the apprentice is capable of making every type of vessel"* (↑ibid.:2).

In Wallaert's view, this type of K3 TVET is an essential component in the *social maturation* of the trainees. According to Wallaert, this can be seen as a form of more comprehensive learning (↑ibid.).

We note that this publication is a book chapter in ↑Stark and colleagues (2008). Unfortunately, the whole book was not available to us, so we cannot determine whether and to what extent child protection is discussed. In our view, this form of TVET must also be discussed from an ethical point of view and in terms of child protection.

Apprenticeships can possess formal characteristics too. Company-based TVET Type K3, for example, can clearly take place in regulated / taxed industries. This form of TVET is used by some companies in SSA in response to skills shortages and *"as a strategy for enhancing their competitiveness by adapting to new skills and technology"* (↑Ghana, Kenya, Tanzania, Uganda: Kweka, et al., 2006:2).

Atchoarena and Delluc mention different forms of TVET that take place only in the workplace (type K3) (↑Atchoarena & Delluc, 2002, cited in ↑Oketch, 2007; also see ↑Mali, Senegal: Atchoarena & Esquieu, 2002). In their opinion, the differences are regional. This means that certain characteristics are more common in francophone or anglophone countries (↑ibid.). However, on the basis of the U-literature (since 2000), this distinction is not very noticeable.

Walther states that in West Africa,

> *"existing studies on traditional (or informal) apprenticeship generally distinguish between two major types of apprenticeship: Sahelian apprenticeship and coastal apprenticeship"* (↑Walther, 2008).

Sahelian apprenticeship (Burkina Faso, Mali, Niger, etc.) is

> *"characterised by being underpinned by the substitution of family relationships by relations between employers and children"*, i.e., it is an informal-family-type TVET (↑ibid.).

In contrast to Sahelian-type apprenticeship, the *"coastal apprenticeship"* (in, according to Walther, Benin, Togo and Senegal in West Africa),

> *" is paid for and is thus based on a commercial relationship between employers, apprentices and their families"* i.e., an informal-formal-type learning (cf. Chapter 6; ↑Walther, 2008).

According to Walther, some of the difficulties with both schemes are

> *"the insufficient qualification of master craftsmen and their inability to theorise certain concepts or techniques"* and the *"lack of training methodologies that suit the educational levels and learning cycles of the young people being trained"* (↑Walter, 2008).

Höjlund contrasts the West African traditional apprenticeship (with *"formal contracts, training periods and certification"*) with the traditional apprenticeships in Tanzania, which are less formal (i.e., informal-informal, c.f. Chapter 6) (↑Höjlund, 2013; cf., ↑Palmer, 2009).

8.1.4. Examples of technology-driven and distance learning (Type Z4)

Distance learning was considered for teacher education (↑Zimbabwe: Samkange, 2013; ↑South Africa: Mubika, & Bukaliya, 2013; ↑General: Moon, 2008), for education for healthcare employees (↑Tanzania: Nartker & Stevens, 2010) and for TVET in various other disciplines (supported by higher education institutions including Makerere University, the University of Nairobi, Addis Ababa University and the University of Dar-es-Salaam (↑Uganda: Openjuru, 2011).

Some studies consider distance learning in terms of the utilisation of specific technologies such as mobile phones. Examples include the training of social studies teachers (↑Nigeria: Adedoja & Oluwadara, 2016) and nurses (with SMS messages — on the topic of anaesthesia — sent daily for one month; ↑South Africa: Duys, et al., 2017).

Technology is an important feature in itself, with the literature frequently considering programmes supported by technology. For example, one study acknowledged that apprentices in electrical engineering

> *"need to [update] their knowledge beyond what is learnt in the classroom or workshop"* (due in part to *"challenges of insufficient resources"* in the aforementioned settings (↑Nigeria: Chukwuedo, 2013:122).

Other programmes surveyed include, for example, e-learning courses provided by higher education institutions to adult learners (↑Uganda: Openjuru, 2011) and a short-term, computer-based training package for health professionals (↑Gambia: Dawson & Joof, 2005).

8.1.5. Examples of other continuing professional development and in-service approaches (Type Z5)

Additional continuing professional development (CPD) and in-service TVET approaches (which do not fall into Types K1–K3 or Z4) also emerge in the U-literature. These include for example:

1. Participant-to-participant schemes (or cascade models), through which a number of active professionals in a sector pass on their newly acquired knowledge to others. This occurred in the industrial context of rice farming in Tanzania (↑Tanzania: Nakano, et al., 2018:2). Here,

   "20 farmers … were trained on new cultivation technologies at a nearby training institute for 12 days". These 'key farmers' then *"held training sessions at a demonstration plot, [where they were] responsible for inviting*

five additional farmers [who] were expected to later train other non-trained 'ordinary farmers'".

2. Non-formal education for illiterate adults and girls who have not completed school, using a model where

   "parents and children learn together on the basis that there is a strong link between the educational achievements of young people and their mothers' levels of education" (↑Ghana: Gaidzanwa, 2008: 20).

3. Mentorship-based TVET, which was combined with 'in-class' coaching and experiential learning for participating kindergarten teachers in Ghana (↑Ghana: Wolf, 2018).
4. Short courses to provide specific competencies (lasting as little as 10 days) targeted at those participating in TVET courses, such as Kenya-based apprentices (with regards to solar panel systems) (↑Kenya: Simiyu, et al., 2014). Such short courses can be found in different educational sectors.
5. Other CPD courses, often aimed at teachers. This includes those provided in an ad hoc manner across a number of different subjects and teacher-specific topics, including *"pedagogical skills"* and *"new curriculum programmes"* (↑Kenya: Onderi & Croll, 2008:365; also cf., ↑Cameroon: Lange, 2014; ↑Cameroon: Lange & Benavot, 2016; ↑Various: Briquet-Duhazé, 2014).[5]

The diversity of other CPD and in-service approaches are representative of the wide array of TVET types found in the U-literature. This is likely to be a reflection of the diverse nature of TVET providers (see RQ19) and country contexts (see RQ16). One clear pattern is the lack of TVET approaches that are specifically 'dual' (Type K2). This may indicate that models that thrive in Western contexts might not necessarily be suited to sub-Saharan socio-economic settings, where problems such as limited private company participation (↑Ethiopia: Krishnan & Shaorshadze, 2013) and inadequate funding (↑South Africa, Guinea: Sandirasegarane, et al., 2016) were identified, which hinder implementation.

8.1.6. Recognising informal TVET

We also note that a number of countries do recognise prior informal learning ('recognition of prior learning', abbreviated as 'RPL').[6] According to Hlongwane, South Africa has the most developed system of accrediting prior learning, compared to its sub-Saharan African peers (↑South Africa, Mauritius, Namibia, Seychelles: Hlongwane, 2018). Nduna states that, in 2015, South Africa published the Draft Recognition of Prior Learning Policy for the Higher Education Qualifications Sub-Framework (HEQSF; ↑South Africa: Nduna, 2017). This framework enables individuals to move within and between non-completed qualifications, while providing them the opportunity to advance within

5 From outside SSA, we note that Everingham and colleagues specifically addressed TVET teacher education, analysing the challenges of scholarship and industry currency in the sector (↑Australia: Everingham, et al., 2018). However, the project was a pilot in Australia.

6 The term RPL is used synonymously by some authors for recognition of informal learning.

qualification programmes and to complete them (↑ibid.). The author adds that this also accelerated *"the redress of past unfair discrimination in education, training and employment opportunities"* (↑ibid.:285).

For Peliwe Lolwana (University of the Witwatersrand, South Africa; participant in the SCR focus group), however, South Africa neglects the informal sector, which she considers to be a constraint in the country. In her opinion, they might have the resources, but the neglect of the informal sector is a limitation for TVET development. In contrast, she names Ethiopia, a country that has progressed in TVET in a way that South Africa would not have been able to do.

Mauritius, Namibia and Seychelles have also developed national policy guidelines for the recognition of prior learning. In Namibia, the Community Skill Development Centres (COSDEC), created to address the high TVET dropout rates, have introduced a research-based approach to curriculum development regarding the inclusion of informal learning (see also Burkina Faso: ↑Sawadogo, 2012). Local market assessment and studies were used

> *"to develop training programmes that are reflective of the real market opportunities available to their learners"* (↑Namibia: Galguera, 2018:133).

Based on this information, COSDEC have diversified their training, implementing both long and short courses, with different skills and product focuses. Surveys carried out in seven countries support this approach showing that, for informal training schemes to be effective, they need to be tailored to the social and economic situations they are supposed to improve or develop (↑Walther & Filipiak, 2007).

Through policy analysis, we found that the Uganda Vocational Qualification Framework includes the assessment of prior learning and recognition of formal and non-formal training (↑Government of Uganda, 2008). The country's 'Formal Education Pathways' indicate that those in non-formal skills training can obtain the 'Trade Test Certificate', which gives them access to technical schools, farm schools and community polytechnics. This, in turn, allows students to progress to university degrees and postgraduate studies (↑Government of Uganda).

Another example is the recognition of previous learning in Kenya (KNQA)[7]. We also refer to the publication of the UN's International Labour Office, which covers the topic of informal education and its recognition (↑International Labour Office, 2012). Also within this thematic area are the publications of Palmer (↑Ghana: Palmer, 2009) and Sawadogo (Burkina Faso: ↑Sawadogo, 2012).

7 ↑Kenya National Qualifications Authority, Recognition of Prior Learning, *available at* http://www.knqa.go.ke/recognizing-prior-learning/

8.2. Pedagogical approaches

In this section, we look at teaching approaches within the college / classroom setting, as well as its practical components (RQ7.e). With regards to the key teaching approaches and classroom activities occurring within TVET programmes, the U-literature showed there to be:

1. regular emphasis on interactive pedagogy;
2. employment of non-interactive (lecture-focused) approaches that occasionally centre on lectures from foreign guests;
3. an interest in the employment of ICT for teaching and learning.

8.2.1. Interactive pedagogy: Authentic tasks

There were frequent references to interactive learning in the publications we surveyed. However, they lacked clear information on the manner in which interactive practices were employed, which may be representative of an overly theoretical focus within the surveyed education literature.[8]

Two publications mention pedagogical approaches with clear details on practical implementation:

1. Safford and colleagues note that importance is placed on *"Engeström's key 'ingredients' for effective learning"*, which include *"authentic tasks*[9] *and interactions with others"* (↥Malawi: Safford, et al., 2013:197).
2. Lange and Benavot characterise notions of *"learner-oriented teaching"* as being central to a particular model for teacher education (↥Cameroon: Lange & Benavot, 2016:21).

Cunningham and colleagues specifically detail the active learning provided (↥Tanzania: Cunningham, et al., 2017). Here, information on the development of an emergency nursing course in Tanzania was based on an *"active learning approach"* and purportedly followed andragogic[10] principles, such as considering a person's past experiences

> *"when applying new information that may contradict current standard practices at facilities"*.

A clear indication of how this occurred was then provided. In this case,

> *"participants were encouraged to share their experiences, challenges, and daily situations regarding the learning activities"*, to enable them to *"blend their past and new knowledge"*.

8 We note that in the teacher-education literature in SSA (e.g., Haßler, et al., 2018 and references therein), as well as the general educational literature in Germany, effective TVET-pedagogy models appear to be a topic of research interest.

9 *The usual understanding of 'authentic tasks' means tasks that deal with problems from the pupils' real-life or work environment.*

10 ↥Wikipedia, Andragogy, *available at* https://en.wikipedia.org/wiki/Andragogy

The course remained consistently interactive through a combination of activities and simulation.

A discussion on the potentials of contemporary learning theories for designing quality TVET is provided by ↑Sarfo (Ghana: 2016). The author proposes the integration of aspects of four learning theories for designing effective, good-quality TVET teaching and learning for the 21st century: Behavioural, Cognitive, Situated Cognition, and Constructivist.

8.2.2. Non-interactive (lecture-focused) approaches

Non-interactive (lecture-focused) approaches appear to be dominant in college-based education. This is supported by evidence from the U-literature, including a UNEVOC-report:

> *"Strongly established examination-oriented approach to curricula implementation is one more obstacle preventing Nigerian TVET from due development"* (↑UNESCO-UNEVOC, 2012:12).

In Tanzania, pre-service teacher education was found to be predominantly lecture-based and delivered by trainers who lacked *"experience and expertise in primary education"*, thereby creating a gap between theory and practice (↑Tanzania: Hardman, et al., 2012:827). An investigation into the practices of lectures at Sunyani Polytechnic – a Ghanaian institution providing TVET programmes – also showed that the majority of lecturers were most comfortable *"using traditional ways of teaching (chalk and blackboard and handouts dictating notes)"* (↑Ghana: Bonsu, et al., 2013:16).

Bell discusses educational lectures by international guest lecturers at a TVET college that trains nurses (↑Ghana: Bell, et al., 2014). As is often the case with guest lecturers, they present alternative pedagogical methods with technology-based approaches (↑South Africa: Duys, et al., 2017). This can, of course, help to make college teachers think more thoroughly about pedagogy in the courses they offer. However, if the lectures offered by the guest lecturer are themselves barely interactive, the college teachers will hardly benefit from them in this respect, in order to support emergency nursing training in Ghana) (↑Ghana: Bell, et al., 2014).

8.2.3. Information and communication technologies (ICT)

In line with global trends in ICT in education, many papers considered the application of ICT to TVET education, and a full account is provided in Chapter 6. In this section, we mention papers that looked at ICT specifically in relation to pedagogy. One was a descriptive quantitative investigation into the use of technology by TVET lecturers in Kenya, which suggested that

> *"90% of lecturers agreed … that instructional use of ICT greatly improved the instruction they gave"* (↑Kenya, Rwanda: Agufana, et al., 2015:85).

In addition, video-mediated learning in Benin enabled insight into local practices

> *"by having farmers show and explain how the concerned technology works"* (↑Benin: Okry, et al., 2014:28).

In Malawi, the use of ICT was not only considered as a means of delivering TVET: it was a programme outcome in itself, because healthcare workers were being trained to solve working tasks with the ICT tools in the programme (↑Malawi: Mastellos, et al., 2018).

We note that the OER4Schools[11] approach is unique, in that the full programme is freely available (as an Open Educational Resource) alongside research publications spanning an extended period of time. It is, therefore, possible to relate the research outcomes back to the exact resources that were used in achieving this outcome (↑Haßler, et al., 2018; and references therein).

8.3. Findings relating to practical components of TVET

We now look at practical components within TVET, which are closely related to the cooperative (transversal) dimension (Chapter 4.4). In many of the programmes considered in the surveyed publications, no practical components have been discovered (see Chapter 8.3.4.). Despite this, there are instances where they are utilised. Sectors that have practical TVET components include education and health. Home-based entrepreneurs and artisans have also been found to offer practical components in their TVET. Further detail on these findings are presented in the sections below.

8.3.1. Education sector: Initial teacher professional learning

There is a broad body of literature considering the importance of practical experiences in teacher professional development (↑Haßler, et al., 2018, and references therein). Within the U-literature, the cascade model of teacher training considered by Lange and Benavot was reported to include ample opportunity for knowledge application through practice (↑Cameroon: Lange & Benavot, 2016). During teacher training, theoretical modules were *"followed by practical modules in programme schools"* (↑ibid.). State Initial Teacher Education courses were generally reported to include practical components, with Zimbabwean teacher trainees, for example, completing a four-month practical period during their two-year course (reported in an article considering the integration of ICT into teacher education (↑Mozambique, Zimbabwe: Musarurwa, 2011). Other programmes in the education sector sought to impart knowledge to participants through the observation of teaching practice by school mentors (↑Malawi: Safford, et al., 2013).

8.3.2. Health sector: Practical components

Within the health sector, some of the publications deal with the use of practical components in various TVET programmes. These programmes require practical work (not always at the future place of work), in which what has been learned is applied. One

11 ↑OER4Schools Professional Learning Resource *available at* www.oer4schools.org; publications at https://bjohas.de/Publications

example of this approach described a clinical exercise book for a nine-month programme in rural Uganda (↑Uganda: Miceli, et al., 2012).

Another example is the training of midwives in several countries. The training involves supervised practice procedures on anatomical models and consenting patients (↑Zambia: Prager, et al., 2012), and learning to provide pre- and post-natal care to mothers (↑Ethiopia, South Sudan, Uganda: Cabridens & Tolve, 2012). Other training for nurses, provided through accredited institutions in Kenya, involves varying levels of on-site and off-site practical training elements. However, the scope of these practice units varies according to the type of programme (↑Kenya: Appiagyei, et al., 2014).

8.3.3. Practical components in apprenticeship contracts in Ghana

Hanson's study offers a fascinating perspective on urban livelihoods and apprenticeship contracts of the early 2000s in Koforidua, Ghana (↑Ghana: Hanson, 2005:163). We note that the artisans and entrepreneurs who offer such apprenticeship contracts include woodworkers, refrigerator repair-people, metalworkers, tailors, hairdressers and seamstresses (↑Ghana: Hanson, 2005). The apprenticeships share common practical components and provide a *"hands-on, practical approach to training"* (↑ibid.:167). However, practical learning is largely provided to learners in exchange for fees (which conflicts with other interpretations of apprenticeships, in which apprentices receive remuneration during training). In Koforidua, Ghana, these apprenticeship arrangements are formalised by contracts established between apprentices and tutors that entitle the tutor to a fixed sum before, during or after completion of an apprenticeship (with further indirect remuneration also obtained through the 'free labour' provided by an apprentice) (↑ibid.).

Hanson analyses local-level apprenticeship contracts and associated networks, and notes that such contracts can have negative consequences. For instance,

> *"demands of reciprocity or support from co-network members, neighbours and family, can be so taxing that some individuals opt out of the network"*. Nevertheless, Hanson contends that *"apprenticeship contracts and the network spaces they create have created a new social cohesion and community that transcend the traditionally known spaces of social support, i.e., ethnic ties, family ties or even institutional support"* (↑Ibid).

8.3.4. The lack of practical components in pre-service programmes

Work-oriented components are often missing from training programmes. As noted above, such a lack of practical components is commonly considered to be a programme limitation (RQ7a). The surveyed literature characterised certain programmes as being centred on 'theoretical' teaching (see, for example, a study that focused on nursing education in Tanzania: ↑Muganyizi, et al., 2014).

In their consideration of tourism education and training, Mayaka and King note that there is a lack of formal training incorporating *"on-the-job experience [which] poses a*

challenge for both industry operators and education-providers" (↑Kenya: Mayaka & King, 2002:130). It was noted that a Bachelor's degree course[12] in Catering and Hotel Management provided no facilities to teach practical skills (although these still appeared to be learnt by students) (↑Uganda: Tukamushaba & Xiao, 2012).

In considering TVET teachers' perspectives on technical education, Chikasanda and colleagues report that interviewees wanted their students to *"be given more time to practice"*, with a *"work-oriented approach"* being considered more suitable than an examination-focused one, particularly in the study of metalwork and woodwork (↑Malawi: Chikasanda, et al., 2011:374). There is also a reported consensus among Sudanese teachers *"that the practical training during their initial education is too weak"* (↑Sudan: Ahmed, 2010:116).

Similarly, an analysis of family planning (FP) teaching in clinical and nursing education found that *"none of the assessed practical modules or sessions in all [evaluated] schools was devoted for family planning"* (↑Tanzania: Muganyizi, et al., 2014:5). Furthermore, less than one in four of the evaluated schools had practice rooms (although three in four were connected or linked with a family planning clinic). The resultant lack of opportunity for practical exposure was identified as being of concern to FP teachers.

Finally, it was recommended that TVET teacher training programmes in Ethiopia had both an inbuilt 'industrial practicum'—where prospective teachers could practise what they had learned *"in an authentic workplace setting"*—and an inbuilt 'school practicum'

> *"in which teacher training students go to TVET schools for direct observation, mentorship and actual teaching practice with critical supervision"* (↑Ethiopia: Solomon, 2016:72).

8.3.5. Short courses (CPD)

Practical training in the form of short courses (continuous professional development, 'CPD') were also identified in Kenya. For example, training of professionals in the use of solar panels (over a 10-day total period) consisted of five practical sessions:

> *"module mounting, solar cell/module characterisation, storage batteries, system sizing, wiring, installation and commissioning"* (↑Kenya: Simiyu, et al., 2014:821).

After practical sessions, the small groups that participated spent one hour discussing and presenting their experiences (↑ibid.).

Similarly, a five-week training course for Ebola preparedness among district surveillance officers in Côte d'Ivoire, Guinea-Bissau, Senegal and Mali, included two field projects:

12 As noted above, we are including programmes irrespective of the qualification, as long as they fit into our operational definition of TVET, cf. Chapter4. This course effectively fits the description of 'initial TVET' and is thus included here.

> *"conducting a data quality audit by visiting a minimum of 3 health posts in their district"* and *"drafting a surveillance summary report of nationally reportable diseases"* (↑Nigeria, Guinea-Bissau, Sierra Leone, Senegal, Liberia, Mali, Guinea: Cáceres, et al., 2017:175).

Field-based training for Ugandan rice farmers was also mentioned in the literature. The participants are involved in the creation of an experimental demonstration rice field, the construction of school beds and irrigation canals, and in harvesting the crop (↑Uganda: Kijima, et al., 2012).

Finally, we note that sometimes, short courses are associated with companies outside SSA, such as training for road construction provided by Chinese enterprises in Kenya (↑Kenya: King, 2010).

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