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# Technical and Vocational Education and Training in Sub-Saharan Africa

A Systematic Review of the Research Landscape



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## Executive Summary<sup>1</sup>

This report reviews the state of research on technical and vocational education and training in sub-Saharan Africa (SSA). It is an extended and updated version of an earlier German report.<sup>2</sup> The original report features a systematic review of both academic and grey literature as well as other sources of information, such as other internet research. The present report extends the sources of information further by including interviews, focus groups and reflective artefact analysis. While both academic and grey literature offer significant insights, such other sources of information need to be considered, especially where sectors are under-researched. Our literature-based approach is, therefore, complemented by interviews, reflective artefact analysis—in the form of a structured community review—and focus groups. Overall, this report contributes to a deeper understanding of TVET research in SSA with a focus on the improvement and the development of TVET systems and research; ultimately it seeks to contribute to the achievement of the human development outcomes associated with technical and vocational education and training.

We note that we use the phrase ‘Technical and Vocational Education and Training’, abbreviated as TVET, in a broad sense that includes the range of approaches prevalent in SSA. This interpretation is not unique to this report (†Lauterbach, et al., 2018)<sup>3</sup> but differs from other conceptions, such as the conception of TVET in Europe.<sup>4</sup> It should be emphasised that the present report provides a systematic overview of the available research on TVET in SSA between 2000 and mid-2019 (in English, French, Portuguese and German), following the methodology outlined and subject to the usual limitations

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2 †Haßler, et al. (2019). *Berufsbildung in Sub-Sahara Afrika: Stand der Forschung* (Berufsbildung in SSA). VET Repository, Bundesinstitut für Berufsbildung, Bonn, Germany. Available at: <https://lit.bibb.de/vufind/Record/DS-184013>

3 Lauterbach, U. (2018). Die Schritte zu einer internationalen und international vergleichenden Berufsbildungsforschung. In F. Rauner & P. Grollmann (Eds.), *Handbuch Berufsbildungsforschung* (3. aktual. u. erw., p. 52). UTB.

4 In other words, the term ‘berufliche Bildung’ (used in German-speaking countries) is translated with ‘technical and vocational education and training’, as Lauterbach recommends (†Lauterbach, et al., 2018). Lauterbach refers to the UNESCO decision to use this term for both "vocational education and training (VET)" and "technical vocational education and training (TVET)". In the EU, however, a distinction is made between VET and TVET (†*ibid.*).

of such reviews. Therefore, this broad review is not necessarily representative of in-depth research in any one country in SSA. For instance, there were some documents and research papers that we were not able to access because they were not available online and the authors did not respond to our enquiries; some communities of researchers may have well access to these, but we were unable to retrieve them.

The variety of TVET systems, as well as the lack of a clear overarching definition of TVET, does have important ramifications regarding harmonisation and compatibility of different systems. However, it also complicates research and systems analysis. In order to capture this variety, this report develops a reference framework covering several dimensions, which are described in Chapter 4. In any one country, it is likely that various concepts and several forms of TVET coexist. This includes various formal and informal approaches. Options for international cooperation and alignment across such approaches need to be considered in the future. We also note that in many countries in SSA—as well as in European (Germany) and North American countries—forms of ‘technical and vocational’ education and ‘academic’ (‘higher’/tertiary) education are merging; future research should adopt broad definitions of TVET, TVET institutions and TVET research.

The transition from school to work is not without problems for many young people; well-designed TVET can ease this transition by lowering the threshold for entry into the sphere of work. Therefore, a key aspect for TVET research is the transition from general education to TVET; this includes both initial TVET as well as further and continuing education. Indeed, many TVET researchers and TVET practitioners advocate meaningful, lifelong, professional learning that starts with general education and continues beyond initial TVET. However, in practice, many TVET systems and TVET institutions are not always able to meet these requirements.

It is important to note that this report is concerned with the state of TVET research in SSA, rather than purely with the state of TVET in SSA as such. While we are, of course, concerned with what TVET research has to say about the evidence regarding TVET, our overall focus is on issues surrounding TVET research. For example, we are not just concerned with TVET actors (and analysing the TVET system as such); we are also concerned with TVET researchers (and TVET research systems). The following sections will summarise the conclusions reached by taking this approach.

### **Themes, perspectives and current debates in TVET research**

The literature review, interviews and focus groups identified various themes, perspectives and current debates. Our first important observation is that there is no common definition and concept for TVET valid in all countries or regions in SSA. This is due to the fact that evidence-based insights from the reviewed publications stem mainly from research on specific interventions and TVET programmes with a national or international focus; they do not tend to research overarching definitions and do not seek to elaborate frameworks.

A clear theme is a need for TVET—as well as TVET-teacher professional development—to be as practical and as practice-focused as possible. Other themes include the tension between TVET policy and practice, the importance of researching

demand-driven TVET, and of research on future possibilities and aspirations for TVET: arguably, policy has not kept pace with such demands. Another important topic in TVET research is Information and Communication Technology (ICT). The publications reviewed analyse future possibilities, applications, benefits and costs of ICT in TVET. Utilising technology to evaluate TVET is also discussed as an important aspect. A further theme is the importance of evidence-based understanding of specific TVET interventions and TVET programmes, which is apparent in a significant number of publications.

Expert participants in our interviews and focus groups highlighted several additional current and emerging topics in TVET research. Greater access and equality in TVET were identified as requiring further research, particularly with regard to women and immigrants. Other topics raised were the aforementioned links between theoretical and practical elements in TVET, the perception of TVET, curriculum and skills development, TVET teacher education, policy and ICT. Green TVET is another research area highlighted as emerging by the participants. The topic appears to be gaining prominence because of UNESCO/UNEVOC advocacy for research in the field.

The expert participants also shared their own thematic interests and motivation for participating in TVET research. Participants expressed interest in research exploring the integration of theoretical and practical elements of TVET, the 'dual TVET system', increased focus on the professionalisation of the workforce and professional development with respect to TVET, and further collaboration between countries for the advancement of TVET within primary and secondary education. The relevance of TVET to everyday life and greater access and equality within TVET were also expressed as research interests.

Participants further noted that in order to motivate greater interest in TVET, there is a need for greater funding, capacity building and networking. This was suggested alongside changing the perception of TVET as only leading to low-class occupations and as not being a university-level pursuit.

### **TVET insights with high-quality evidence**

TVET research in SSA is not systematic and not always of high quality. Around 20% of the relevant publications reviewed were deemed as being of satisfactory relevance (and included on our 'H-list'), while less than 5% were considered to be of high relevance (and included on our 'U-list' of around 300 publications). Based on this categorisation, we identified the key challenges for TVET and TVET research identified in the higher-quality research, namely: the development of TVET institutions, the promotion and growth of TVET staff numbers, the improvement of the image and perception of TVET and the importance of ICT in TVET.

Within the reviewed publications, evidence regarding the impact of TVET on developmental processes, i.e., development impact, is often inadequately researched and, unfortunately, of limited validity. In particular, the evaluation of the impact of specific TVET programmes is limited. Deficiencies affecting the internal and external validity of the results are due to the low sample sizes and the failure to control statistically important variables. Often, only one-off surveys are carried out, using purely qualitative methods that rely only on self-reported data without triangulation. Studies with higher quality

designs produce diverse insights into the impact of the programmes. Although some successful results have been documented, this is far from being the case for all projects.

### **Insights into TVET policy**

There are a number of recommendations for TVET policy and policymakers. These recommendations include a broader investment in TVET resources, an intensified push for meaningful completion of TVET (i.e., meaningful qualifications), strengthened practice orientation of TVET, extended TVET-teacher education, increased networking of TVET providers including experts from industry and business, as well as greater attention to—and involvement with—the informal sector (informal work, informal TVET). With regard to TVET providers, greater emphasis on the more effective use of ICT in teaching and learning is demanded; it is clear that such use of ICT would also require a revision of existing TVET programmes. Ideas for further research include taking advantage of findings from fields adjacent to TVET (e.g., social science, education; also findings pertaining to higher education in general). Furthermore, there are opportunities for building on or extending findings from existing studies, particularly on the impact of policy.

### **Insights into TVET models**

TVET is undertaken in a variety of different models across SSA. There is no single conceptualisation of what TVET is, what a TVET model should entail, or indeed how TVET is implemented. TVET models differ in how they are delivered, including the place of delivery (e.g., college vs. workplace), and more generally in the balance between involved practical vs. theoretical elements within teaching. Models also differ in the level of formality of the programme (formal college enrolment vs. informal workplace learning). The colonial history of specific countries is also a factor. For example, there are similarities in the research literature regarding the types of TVET practised in franco-phone countries compared to anglophone countries; however, these similarities appear minor in comparison with differences between nations.

Despite these differences in the conceptualisation and practice of TVET, we have been able to group the various models into five categories, as described below. Where initial TVET is concerned, models can be classified according to the extent to which they focus on practice (cooperative dimension, 'K' based on the German term 'Kooperativ') into five overlapping models: K1, K2, K3, Z4 and Z5.

Type K1 models utilise a predominantly theory-based approach. This type of models is the second most common approach besides the K3 models. Such approaches are utilised, for example, in the health professions and the craft sector (as evidenced in South Africa, Cameroon, Uganda and Kenya).

Type K2 models are less common; they aim at college-based education with a large practical component. In such models, practical and theoretical components may be equally weighted. Such models share aspects with so-called 'dual TVET systems', which have been tested by a number of states in SSA (Ethiopia, Mozambique, Mali, Malawi, Botswana, Tanzania). 'Dual systems' recognising that both limited theoretical knowledge as well as inadequate practical experience obstruct the successful entry into professional life.

Type K3 models encompass informal education and can be found across SSA. As a rule, they consist entirely of informal work-based training, taking place almost exclusively at the workplace. Although this form of TVET is well established in many settings, it is often poorly recognised, and not addressed by TVET policy.

This classification of initial TVET is augmented by two further approaches that usually occur at later stages (temporal dimension, 'Z' based on the German term 'Zeit'). These are Type Z4 models, which focus on technology-supported distance learning (both initial and in-service), and Type Z5 models, which focus on in-service approaches and continuing professional development (CPD). This classification is not conceptual, but heuristic in nature, designed to capture the types of TVET discussed in the literature. Such programmes are of shorter duration, typically informal and used very widely; we did not detect specific patterns for some countries participating more than others.

We found that publications considering the pedagogical requirements of TVET educators and teachers typically come to the conclusion that a stronger emphasis must be placed on practice-focused TVET. The aim should be to offer interactive TVET, in which authentic practice-relevant tasks are solved. However, researchers' attention is not focused solely on the cost-effectiveness and relevance of TVET for the labour market. Additionally, TVET needs to be understood not as a narrowly focused acquisition of technical skills, but as opportunities for general education, which help learners to develop personally, to develop a critical understanding, and to take responsibility within society. This perspective offers opportunities for development and innovation not only from an economic but also from a societal perspective. While the personal development of learners is mentioned in conjunction with entrepreneurship, overall, the TVET sector appears to not place emphasis on the personal development of learners. Extending the perspective on general education to TVET, such perspectives can be realised by a pedagogical approach to TVET that is critical and competence-oriented; such an approach needs to promote student-centred teaching and reflective learning (Chapter 13). If the issue of personal development and education is neglected (as is often the case in informal education), students may become vulnerable to exploitation and ill-treatment in the workplace (Chapter 13).

### **Inclusion-related challenges**

There are far-reaching inclusion-related challenges in TVET and TVET policy (Chapter 9). For example, inclusion tends to focus on the extent to which women are included in TVET education but rarely consider broader discussions regarding gender identity that are prevalent in higher-income countries. We note that all of the gender-focused publications acknowledge that women's TVET-related skills and competencies are naturally the same as men's. Nevertheless, TVET and workplaces often do not recognise this. Publications from Ethiopia, Ghana, Uganda, Mozambique, Benin and Burkina Faso indicate that women are often unable to utilise their skills because the relevant opportunities for TVET are not always available to them. Researchers from Tanzania, Zambia and Zimbabwe found that women often do not even consider apprenticeships. Furthermore, when women do engage in workplace training, as in Western countries, it is less likely to be in a highly technical subject, such as engineering, and more likely to be in, for

example, healthcare (c.f., publications from Ghana, Kenya, Benin, Congo, Burkina Faso and Mozambique). Teachers/educators play a central role in addressing gender equity, so their education should become an important field of research (c.f., publications from Ghana, Nigeria, Sierra Leone, Gambia, Liberia and Malawi).

Studies from Ghana, Ethiopia, Tanzania, South Africa and in particular Kenya, focus on both the right to and availability of equitable access to TVET for all people, thus touching on inclusion issues that focus on TVET for people with disabilities. According to these studies, disability issues are neglected in both education policy and in the necessary statutory provisions.

Refugees in SSA must also be considered partly as vulnerable groups in terms of TVET. Indeed, TVET may offer opportunities for refugees to improve their circumstances. Refugee status can also have an impact on inclusion. One study from Uganda indicates that TVET for refugees can be a way to integrate them into a new community. The expert participants in the interviews also highlighted the current focus of research exploring TVET programmes for immigrants in Nigeria, who themselves are often vulnerable.

We emphasise, however, that young people—including those with formal TVET—may be disadvantaged compared to older people in the labour market. This is due, in part, to the overly theoretical TVET available to young people and—on completion of the TVET—their limited experience in the workplace.

We note that most of the documents reviewed in this report simply indicate that access to TVET needs to be facilitated for minority groups and that governments and state authorities should be encouraged to do so. However, specific suggestions as to how this could be implemented in practice—or has already been implemented—are rarely found in the literature, and even then are often not very informative.

Overall, we recommend mainstreaming gender aspects and gender equality issues in future research, and developing targeted support for vulnerable groups, including young people and refugees.

### **Key stakeholders in TVET**

Another important topic of this report is key stakeholders in TVET (Chapter 10). For selected countries (Botswana, Ghana, Kenya and Nigeria), the chapter provides a review of the institutions involved in the planning, implementation and evaluation of TVET and those that manage the administration of the corresponding TVET-related processes. Such stakeholders are also direct users of research results. For example, the Botswana Training Authority (BOTA) is developing guidelines and strategic plans for the country's TVET system.

Our internet research indicates that, in most SSA countries, the Ministry of Education and/or the Ministry of Labour are the main governmental authorities for the decision-making and management of the TVET system at the national level. However, specific ministries are often responsible for the provision and delivery of TVET programmes that relate to their specific economic sector. This complicates the overarching educational design and delivery of TVET.



There is research on TVET policy in the four countries considered. However, there is no evidence of the research findings having had any actual impact on TVET policy or on the action of key stakeholders—either at the national or regional levels. Future TVET research should explore how the impact of key-stakeholder research can be better utilised in the administration of TVET processes.

A demographic overview of the key stakeholders in TVET research is also available (Chapter 5). This includes leading institutions and countries in TVET, as well as the academic faculties and departments that participate in TVET research.

### **Non-state actors**

Chapter 11 sets out the role of non-state actors in TVET in selected countries (Ethiopia, Botswana, Ghana, Kenya, Nigeria, Tanzania and Uganda). There is a notable presence of non-state-controlled and private TVET providers in these countries. Such providers often already have—or seek—a degree of influence on the national TVET system. The non-governmental sector comprises large companies, nonprofit organisations, voluntary organisations and NGOs. They have varying degrees of involvement in formulating policy, developing curricula, determining priorities for occupational standards, forecasting future labour demand, and setting indicators for curricula and the quality of work-based education. A good example is Nigeria, where non-governmental bodies offer a real alternative to state providers of higher education for teachers and curriculum development. In Kenya, there is evidence that remarkable work is being done in the private TVET sector. In both Kenya and Botswana, state efforts are being made to involve industry and other stakeholders in the design of TVET.

We note that these insights come from internet research, and it is important to note that data on private TVET providers are inconsistent throughout our dataset. In particular, we did not come across research on the role of the industry as a promoter and beneficiary of TVET. Clearly, furthering cooperation efforts between public and non-governmental TVET institutions would be beneficial and profitable for all those involved in TVET.

We did not discern any evidence of influence on TVET by non-governmental partners, such as unions or (crafts-)guilds. However, it should be remembered that unions certainly play an important national role in SSA, despite not appearing in the TVET literature we reviewed.

### **National standards, guidelines and regulations**

The reviewed literature does not provide much insight into national standards for TVET in SSA (Chapter 12). However, some states in SSA have informative, well-structured and well-maintained websites on all aspects of their TVET systems. However, there were other states where the government websites were not functioning, could only be accessed intermittently, or were not accessible at all.

Botswana, Ghana, Kenya, Mauritius, Malawi, Nigeria, Uganda, South Africa and Tanzania all have national qualification frameworks for education. Such qualifications set minimum requirements for the classification, registration and accreditation of national

qualifications and certificates. In some countries (Ghana, Kenya, Uganda and Tanzania), the frameworks also detail the educational approaches to be followed. In each of these countries, competence-oriented education is recommended. Qualification frameworks specifically for TVET were found only in Botswana, Ghana and Uganda.

Information is provided on some governmental websites (Botswana, Ghana, Kenya, Nigeria, Uganda and South Africa) regarding their responsibility for regulating, accrediting and monitoring TVET. These governments have developed standards for TVET, the quality requirements for which they publish (partially), and for which they monitor compliance (partially).

Whenever the pedagogical approach was mentioned in official documents, competency-based education was unanimously the preferred choice. Although the definition of 'competency-based' is not explicitly clarified, it can be seen from the contexts that the Anglo-Saxon competency-based approach is the inspiration in most cases.

### **Challenges to policy implementation**

Several promising and viable approaches to TVET governance were apparent in a number of countries (Chapter 13). While there is some general research on education policy, few publications are concerned with the adequacy, development and testing of TVET policies or standards. Reports often state that evaluation processes are taking place, but do not describe how these studies are structured and carried out methodologically. It appears that such research has had little impact on national standards and guidelines for TVET. Further research is necessary.

In the evaluated publications, it becomes clear that some of the states involved in the study set themselves very ambitious goals in TVET—including the development of work-focused and competence-oriented TVET. In particular, the effects of TVET policy changes on the classroom-pedagogical level are examined. In Kenya, for example, significant changes in classroom activity can be identified as an outcome of the change in pedagogical guidelines. It is clear, however, that the implementation of these changes poses a great challenge for states in SSA and their TVET authorities. This is an important area for future research.

Publications also mention that the insufficient (and often neglected) financing of the TVET sector compared to other areas of education acts as a barrier to the implementation of reforms (Chapter 13). If competency- and job-oriented education is desired, greater engagement is needed with the private sector and the job market, and their engagement with the TVET system.

There is a limited number of research papers on the different effects of informal education. Young people value informal education because it is considered cost-effective and easily accessible. In addition, it often appears to offer better employment opportunities than formal education. However, insights from Nigeria also highlight the dangers of the unrestrained exploitation of the vulnerable groups that are enabled through informal education. TVET agencies tend to be aware of the opportunities and dangers of TVET without state quality assurance mechanisms. Research into the impacts and the models

used could help to understand and further develop informal approaches; this might be helpful in developing guidelines for the protection of vulnerable groups.

The effectiveness of government policy on inclusion-related goals is unclear. One of the few studies available found that there is still a significant segmentation by ethnicity and gender within the TVET sector (South Africa, see Chapter 13). TVET systems much desire positive changes towards gender mainstreaming and equality for all people; however, the development and implementation of measures that contribute to this is barely controlled or supported. This is another important area for future research.

### **Insights regarding institutional frameworks and research capacity**

The interview and focus groups participants provided insights into institutional frameworks and research capacity-building (Chapter 14). They particularly noted the challenges associated with unfavourable institutional framework conditions and research capacities, as well as how those challenges might be addressed. Currently, the main challenge is insufficient funds for conducting research; funding limitations are related to an inability to provide competitive salaries to highly-skilled researchers and appropriate equipment for research and conference attendance sponsorship. Other challenges are a lack of clear institutional leadership surrounding the TVET research agenda, as well as insufficient regard for the importance of research. Skills shortage in the region is an issue, specifically, a shortage of quantitative research skill expertise, and expertise in working with large datasets.

Participants suggested a range of measures to address the challenges facing institutional frameworks and research capacity building. One suggestion is to undertake more conferences and other events, as well as utilising other tools that facilitate networking and the sharing of ideas. Such activities would also contribute to filling current skills gaps.

### **Actors and networks in TVET research**

TVET research in SSA is not well developed. For example, we found no TVET-related publications for almost one-third of the nations in SSA (13 nations). Therefore, the question of actors and networks in TVET research in SSA is a particularly important one. TVET is conducted at state and private universities as well as independent institutes across various disciplines. A large percentage of the publications relate to TVET in East Africa and Southern Africa (including South Africa). While Ghana and Nigeria (in West Africa) have some of the highest numbers of TVET-related research publications of all SSA nations, overall there are relatively few publications from West and Central Africa.

The agencies that fund TVET research include the United Kingdom Department for International Development (DFID), the United Nations International Children's Fund (UNICEF) and The Fogarty International Center. Regarding SSA-led TVET research networks, our interviews and internet research found some evidence of their existence (Chapter 15). However, the identification of such networks was not an easy task; networks are not centrally recorded; nor are they a focus for donors.

The most commonly found networks (e.g., UNEVOC) focus on all aspects of TVET and not specifically TVET research. Two networks, the Réseau Africain des Institutions de Formation de Formateurs de l'Enseignement Technique (RAIFFERT) and the European Research Network on Vocational Education and Training (VET-Net) focus on TVET-research in SSA (Chapter 15). The International Conference for the professional development of French-speaking engineers and technicians (CITEF) was also mentioned as a conference that facilitates international collaboration. Also mentioned were a number of organisations and conferences that facilitate networking around TVET within the SSA region more exclusively. Of particular interest is the network initiated by Kenya's Technical and Vocational Education and Training Authority (TVETA). There are, of course, also intergovernmental organisations that are not necessarily TVET focused, but that do address TVET concerns to varying degrees. Examples of these include the African Union, the European Centre for Development Policy Management, and the New Partnership for Africa's Development (NEPAD).

While we were unable to find many or indeed large networks other than UNEVOC, the need for networking opportunities is a clear outcome of the interview and focus groups. The focus groups and interviews not only explored what TVET networks and networking opportunities exist, but also how those networks help to build research capacity in SSA. Generally speaking, participants noted that networks are an important factor in improving research capacity across SSA. Networks and networking are considered helpful in knowledge and skills exchange and research dissemination. However, there is a shared understanding that the need to build and sustain research networks is plagued by a lack of resources – financial, human and material. Further limitations to networking efforts include the lack of awareness of networks and networking opportunities that currently exist. Concerning networking, we also note the apparent lack of connections between anglophone and francophone countries, which should be explored. Barriers due to the colonial past still exist, and prevent joint research and development in TVET, despite often very similar settings.

In response to these limitations, participants in the focus groups discussed creating a 'virtual' research community. Instead of intensifying commitment to research in a small selection of countries or institutions, a 'virtual' research community can be made up of participants from different African countries and institutions. We appreciate, however, that even with the promise of virtual research networks, there is a desire, and need, for face-to-face opportunities for networking. In light of this, the focus group participants suggest that efforts should be made to create a list of relevant TVET conferences and researchers across SSA, work toward securing more financial support to facilitate networking opportunities, and present research results more actively, as well as to conduct workshops on research and research methods.