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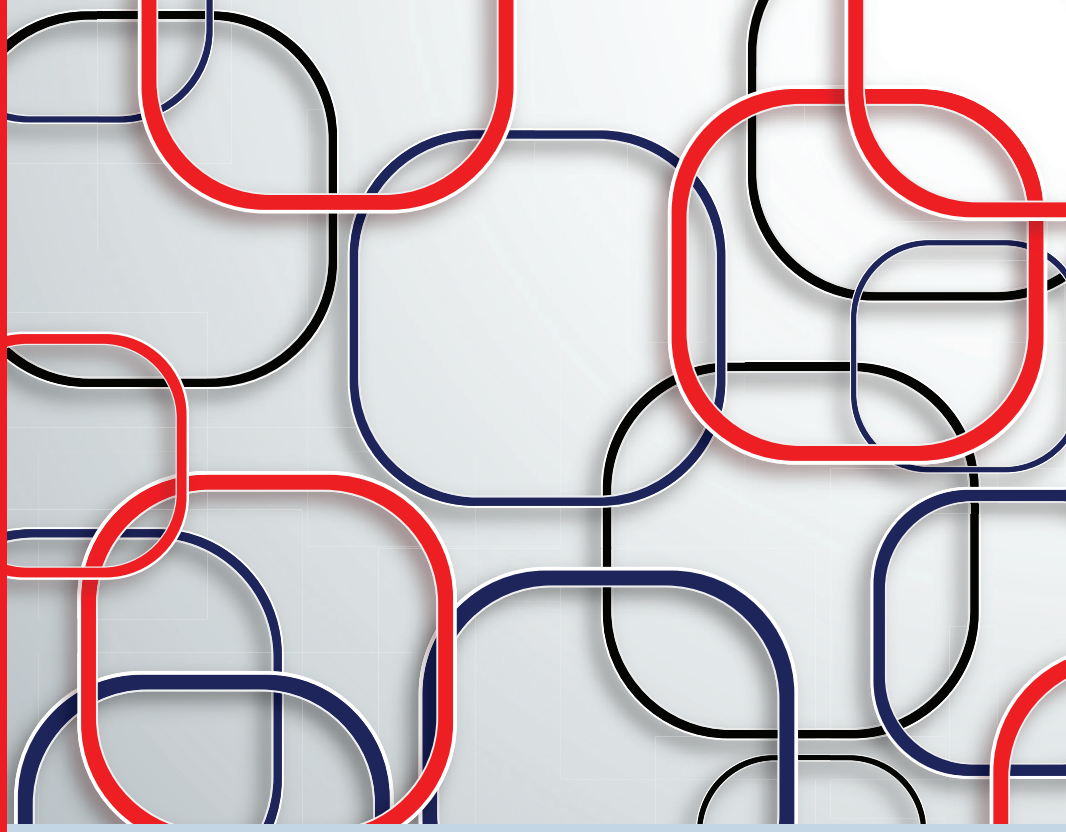
Friedhelm Eicker, Gesine Haseloff, Bernd Lennartz



Vocational Education and Training in Sub-Saharan Africa

Current Situation and Development

VolkswagenStiftung

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Friedhelm Eicker, Gesine Haseloff, Bernd Lennartz

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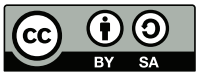

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Contents

Foreword 9

Technical and Vocational Education and Training (TVET) in Sub-Saharan Africa: the missing middle in post-school education
Peliwe Lolwana 11

Cross-country comparison of TVET systems, practices and policies, and employability of youth in Sub-Saharan Africa
Moses Oketch. 25

Session 1
Vocational Education and Training (VET) – Basics for teaching and research in Vocational Education and Training at Universities 39

A comparative study of TVET in 5 African Countries with a specific focus on TVET Teacher Education
Joy Papier 41

Dual Vocational Education and Training Systems in Europe: Lessons learned from Austria, Germany and Switzerland
Waldemar Bauer
Michael Gessler. 48

Developing Lecturers at VET Institutions through Engagements with Industry: the South African Experience
Ken Duncan 67

Models of University-based Further Education Programmes (FEPs) for Vocational Education and Training Practitioners and the Economic Development of Sub-Saharan Africa
Benjamin A. Ogwo 74

Applied Learning design in an online VET Teacher Education course: A pedagogical framework that responds to the needs of mature-aged, employed students
Jillian Downing 83

Paradigms for Networking Universities and Vocational Education and Training Institutions on Competency-Based Further Education in Sub-Saharan Africa
Benadeth N. Ezekoye 93

Theory and method of reflection levels – its use in Vocational Education and Training
Martin D. Hartmann 104

Further Education for Technical and Vocational Education and Training Teachers at Pedagogical University, Maputo
Brígida D'Oliveira Singo 112

Fundamentals of the development of Vocational Education and Further Education of VET pedagogues in Sub-Saharan Africa
Friedhelm Eicker 119

The Train the Trainer-System – Results of a research and development project for and with VET pedagogues in Sub-Saharan Africa
Gesine Haseloff 127

Session 2
Establishment of a VET system with focus on Further Education – presentation of ideas on the motivation and establishment of a Further Education system (FES), especially in Universities in Sub-Sahara Africa...... 134

TT-TVET in Sub-Saharan Area: A proposal for work-process-oriented Teacher Training in the field of Vocational Education and Training
Ralph Dreher 137

Construction of Professional Tasks Based Curriculum for Applied Further Study Programme at Bachelor Level – take Nursing Distance Education as an example
Zhiqun Zhao, Baozhi Sun 145

Situation and Development of Vocational Education and Training and VET Science in Namibia
J. Kamwi Subasubani 152

In-service Teacher Training for VET institutions: the challenge of evaluation in Comunitat Valenciana (Spain)
Anna Ciraso-Calí, Carla Quesada-Pallarès, Edith Mariana Rebollar-Sánchez 158

Participatory research on teaching practice as basis for Teacher Education and networking between universities and VET schools
Guiseppe Tacconi, Adula B. Hunde 167

TVET-University Nexus: Room for Synergy
Ewnetu Hailu Tamene 175

The "three branch model" of Further Education of in-company Vocational Educators: Linking in-company Learning Projects, external training in Further Education and University Learning
Nicolas F. Schrode 183

TVET Teacher Further Education: Practice, Experiences and Reflections of Stakeholders in Catholic Sponsored Community Colleges in East Africa
Peter Changilwa Kigwilu 194

Establishment of a VET-system with focus on Further Education – Presentation of ideas on the motivation and establishment of a Further Education system, especially in universities in Sub-Saharan Africa
Alpheas Shindi 205

The Challenge of Contextualization and Domestication of VET Reforms for Higher Education Staff Capacity in East Afrika
Winston Jumba Akala 212

Session 3
What are concepts or conditions of success for a networked VET learning and teaching (oriented on competence, working practice, flexible, etc.) and especially for a networked Further Education system in VET? 219

Short cycle Higher Education programmes for Further Education of VET Practice skills trainers – An attractive alternative for VET trainers
Piet Lem, Fons Dehing, Cornelis van Dorp 221

Understanding the English subject offered in the South African Technical Vocational Education and Training Colleges and its implications for the curriculum delivery
Mary M. Madileng 231

A Review on TVET Programmes in Ethiopia: An Experience in Biomedical Technician Education
Esayas Alemayehu 240

From "the Chicken or the Egg" Technical-Vocational and Informal Training Story to Industry's Manpower, What Comes first? A Philosophical Study
Daniel Dinis da Costa 249

The Concept of Competence Based Assessment in Vocational Education and Training
Ethel Kyobe ... 257

Shaping and networking with digital media in Further Education: Conceptional and strategic considerations
Christoph Bohne ... 264

Learning and Exchange Platforms: An Approach to professionalise TVET trainers in Namibia?
Silke Partner ... 275

Promoting effective Work Integrated Learning (WIL) and Recognition of Prior Learning (RPL) practices in the TVET sector through research
Nothemba Joyce Nduna ... 282

Teachers understanding of Entrepreneurship Education in Malawi Secondary Schools
Feggie M. Mphasi ... 298

Design of Current Technical and Vocational Education and Training System in Zambia
Gabriel S. Konayuma ... 303

Competency based Education and Training for Training of Trainers in Vocational Education in Namibia: A curriculum evaluation
Lance P. Hauuanga ... 311

Professionalization of VET teachers and Curriculum Development in VET System: Results of Survey, Practice and Challenges in Burkina Faso, Senegal and Germany
Wendkouni J. Eric Sawadogo ... 316

Professionalization of VET teachers in Ethiopia: The current practices, the challenges and the way forward
Adula Bekele Hunde, Giusseppe Tacconi ... 329

Closing remarks ... 342

Authors ... 346

Foreword

In Sub-Saharan Africa, research and development in Vocational Education and Training (VET), including the primary and Further Education of vocational educators (in VET colleges and universities), seem confusingly diverse. VET experts from various theoretical and practical backgrounds – especially young VET scientists from, for instance, South Africa, Mozambique and Ethiopia – find it difficult to analyze and reflect the current situation and foreseeable developments in VET science in Sub-Saharan countries. Therefore, it is challenging to bring the Sub-Saharan African achievements to the international scientific discussion on VET.

Held at Namibia University of Science and Technology (NUST) in Windhoek from 22 to 25 August 2016, with the support of the German Volkswagen Foundation, the Symposium on the Current Situation and Development of Further Education and Research in Vocational Education and Training in Sub-Saharan Africa offered participants from Sub-Saharan African countries, as well as from Europe, Australia and Asia, a unique opportunity to establish and strengthen VET networks. Scientists and practitioners from the Vocational Education sector came together to initiate a discussion process on VET in general and on the Further Education of VET educators in particular.

The general objective of the VET Development Symposium was to explore ideas, new research findings and case studies on competence and networking – topics that are frequently the subject of debate in VET and the Further Education of VET professionals. This discussion should be encouraged, considering previous concepts of competence and networking, to support the development of practical options and implications.

In order to achieve the outline objective, the VET Development Symposium was structured in three parallel sessions:

Session 1 Vocational Education and Training – Basics for teaching and research in Vocational Education and Training at universities. The participants endeavored to analyze the current situation of VET in Sub-Saharan Africa by exploring the character and individual design of the current VET systems in the participating countries.

Session 2 Establishment of a VET system with focus on Further Education: presentation of ideas on the motivation and establishment of an education system, particularly a Further Education system, especially in universities in Sub-Sahara Africa.

Session 3 Concepts or conditions of success for networked VET learning and teaching, especially for Further Education. Participants presented their concepts and conditions of success for a competence-based and networked VET Education and Further Education.

The book follows this structure. The keynotes and articles can be found in the session during which they were presented at the Symposium. A dual review process was carried out to ensure the quality of the articles.

We trust that this book will give you an overview of the current situation of Further Education in Vocational Education in Sub-Saharan Africa and hope you find it informative.

The editors
Friedhelm Eicker, Gesine Haseloff and Bernd Lennartz

Technical and Vocational Education and Training in Sub-Saharan Africa: the missing middle in post-school education

Peliwe Lolwana

Abstract

The structure of education systems in Sub-Saharan countries is characterised by Basic Education; Technical and Vocational Education (TVET) as well as University Education. Whilst the basic education system has grown to be a large system that accommodates almost all children, the size of post-basic education options available to young people in these countries is still very small and weak. There is a social crisis of large numbers of young people who are not in education, employment and work in the context of skills shortages in the labour market. There are, in other words, both supply and demand issues to which the present form of post-school is unable to respond adequately. There is a challenge of the 'missing middle' in the Sub-Saharan education and training systems and young people who simply disappear to thin air after leaving school.

Besides being small, the TVET sector in most Sub-Saharan countries is characterised by a significant lack of practical relevance and responsiveness to labour market needs, insufficient infrastructure and equipment and extremely low throughputs. A major challenge is posed by the quality in teaching. With lecturer training mainly taking place at universities, only a few lecturers combine pedagogical competencies with technical qualifications and industry experience.

In this paper a presentation of the state of technical and Vocational Education in Sub-Sahara will be made, pondering on the capacity of these systems, using a few countries as examples. Secondly, some discussions on the roles different institutions like Universities, Industry and TVET colleges should play in the development of capacity for TVET lecturers, will be made. Lastly, a point will be made on social justice and the denial of TVET opportunities.

Introduction

The Global Monitoring Report (2015) indicates that Sub-Saharan countries have made significant progress in getting the majority of their children in and through primary schooling and some even universalising primary education. Lifting the bottom of education has been good for these countries, even though this has largely happened through the assistance of donor funding in most countries. In countries where universal primary education has not been reached, this report shows how multipronged poverty attributes, which are mutually reinforcing, have been the major force in making it difficult to reach universal primary education provision. Yet, all countries have made significant improvements in the last decade. According to this report, most Sub-Saharan countries are still struggling with successful transitions from primary to secondary schools, and completion of secondary schooling. According to the UNESCO report (2015) it is after 8 to 10 years of education that many children in Sub-Saharan countries drop out of school. However, there are some notable improvements in secondary school completion rates in many countries already and yet transition rates to postsecondary education and work is still very limited in most. We do not know enough about the size of young people who drop out of the school system and simply disappear in societies of many countries.

It is well-known that Sub-Saharan Africa (SSA) is the poorest and most underdeveloped region in the world. Table 1 provides a classification of SSA countries in terms of their Human Development Index (HDI). The HDI has been developed by the United Nations Development Programme (UNDP, 2014) and it attempts to provide an indication of the development status of countries by combining an economic indicator (GDP or income per capita) with two social indicators (education − mean years of schooling- and health − life expectancy). As Table 1 shows there are very few SSA countries in the 'high' and 'medium' human development categories. Of the 52 countries shown in Table 1, thirty-five are in the low HD category.

Tab. 1 Categories of Human Development by Country, 2014

High human development (above 0.7)	Medium human development (between 0.55 and 0.7)	Low Human Development (below 0.55)
Algeria	Botswana, Cabo Verde	Angola, Benin, Burkina Faso
Libya	Congo, Egypt	Burundi, Cameroon, Chad
Mauritius	Equatorial Guinea, Gabon	Central African Republic
Seychelles	Ghana, Morocco	Comoros, DRC, Cote d'Ivoire
Tunisia	Namibia, South Africa	Djibouti, Eritrea, Ethiopia
	Sao Tome and Principe	Gambia, Guinea, Kenya
	Zambia	Guinea-Bissau, Lesotho
		Liberia, Madagascar
		Malawi, Mali
		Mauritania, Mozambique
		Niger, Nigeria, Rwanda
		Senegal, Sierra Leone, Sudan
		Swaziland, Tanzania, Togo
		Uganda, Zimbabwe

Source: *UNDP, 2014. Norway is listed as the country with the highest HDI followed by a number of European and North American countries, and Australia.*

One of the major factors inhibiting economic and social development in SSA is the underdevelopment of the education sector in terms of, inter alia, access, quality and equity. The weakest sub-system continues to be the middle sector of the system in most SSA countries. Many children stay in school until they are old because of lack of alternative education opportunities. As school education becomes adult education in lower income countries, in rich nations post-school education has become mainstream and Technical and Vocational Education and Training (TVET) has found a meaningful place in the middle section of many education and training systems in these countries. In fact, Grollmann & Rauner (2007) are of the opinion that in most high- income countries TVET has become a bridge between the working world and the education system and provides a decisive transition to the employment system for youth. However, the TVET sector is unbelievable small in low − income countries.

In this paper I will start by discussing some of the factors that have contributed to the weakness and smallness o the TVET sector in SSA countries. Many of these factors are located in the political economy discourse. Secondly I will look at the state of the TVET institutions themselves and exploring how these could be strengthened in order to play a meaningful role in strengthening the education systems of these countries as well as developing a responsive labour market. Lastly I will argue on why neglecting this middle system should be a social justice concern.

Why has TVET remained small and weak in many developing countries?

There are many reasons that can explain why TVET remains small and weak in many SSA countries, but in this paper the following will be prioritised as they are seen as being the most important:

a) The political economy of these countries and the financing of education
b) Systemic reforms in TVET in the last two decades

The political economy and financing of education in SSA

In absolute number terms, it is evident that enrolments in TVET are growing much more rapidly than the financing capabilities of Sub Saharan African governments. It is also evident that public funding across virtually all countries in the region will not be sufficient to meet growing demand (World Bank, 2010). The problems and needs of TVET in Sub-Saharan Africa, then, cannot be comprehended or ameliorated (whether by governments or institutions) without addressing the critical and worsening financial austerity.

According to the World Bank (2010:1−2), Africa has maintained its public investment in post-school education (between 1995 and 2010, allocating approximately 0.78 per cent of its gross domestic product (GDP), and around 20 per cent of its current public expenditure on education to post-school education. However, during this period, the number of students increased from 2.7 million in 1991 to 9.3 million in 2006. Enrolments during this period grew at an average annual rate of 16 % while public resources allocated to current expenditure grew at 6 % per annum on average. The World Bank (2010:22) also shows that "the situation is even more dire in the poorest countries, which allocate approximately 0.63 % of their GDP to Higher Education, and where from 1991 to 2006, the number of students quadrupled, while available public resources in general only increased by at most 75 per cent."

The decline in public expenditure per student is having an adverse impact on the quality of both teaching and learning and of research and scholarship. In fact, the World Bank shows that Africa is the only region in the world that has experienced a decrease in the volume of current public expenditure per student (30 % between 1995 and 2010). The austerity is not simply a case of pervasive underinvestment by governments, although a case can be made that the value of tertiary education for sustainable economic growth and broader political, social and civic health has not been fully recognized by all African governments. But the pervasive austerity of tertiary education in the region is more a complex function of underlying poverty, uneven economic growth, surging enrolments, politically and socially compelling competition from other sectors for the scarce public revenues, and too frequently unstable governments.

Under these difficult conditions, the funding of TVET in many countries is undertaken through a cost-sharing model. The costs are shared mainly between govern-

ment – through recurrent and development appropriations – and parents or trainees through payment of tuition fees. Government covers mainly salary cost of established staff, capital development and equipment, while parents or trainees pay training fees and also cover accommodation costs (Ngerechi 2003). The state of funding of TVET in many countries is characterised by swings and fluctuations from year to year, perhaps because of the absence of an allocation formula. Secondly, considering the consistent growth in student numbers it can be argued that state funding of TVET has not matched this growth. The unpredictability in state allocations does not augur well for the institutions' financial stability and makes planning difficult.

With regard to fees paid by trainees, individual institutions determine these fees and as such vary from institution to institution. A negative consequence of cost-sharing is that the fees charged is unaffordable for students from poor families, which has in turn led to poor access and retention. To address the challenges related to training fees, some governments have established a TVET bursary scheme. Its main objective is to increase access, equity and retention, targeting trainees from poor households, orphans, trainees from marginalized communities and female students taking engineering courses. There are some countries that have started to implement a bursary or financial aid scheme for poor students, but these loans and bursaries are only available to students in public institutions.

Training funds or levies are also an important source of funding for TVET. These levies constitute a tax levied on company payrolls. The skills levy is a growing trend in many countries and seen as an important component of funding TVET. In return colleges are required to provide skills development training in line with the requirements of the private and public economic sectors. TVET colleges are also encouraged to generate third stream income. Ngerechi (2003) reports that some institutions have generated income through integrating training with production where the institution is able to recover some of the training costs through sales of students' projects.

From a UNESCO (2013) study, on TVET in the SADC region, we learn interesting patterns. What is striking from the national data is the huge range of public expenditure commitments to TVET. As a percentage of educational budgets, TVET expenditure across the SADC region ranges from 0.6 % to 13.6 %. Nonetheless, it may be argued that there is too little public expenditure on TVET in some countries, particularly where there has been little tradition of private sector contribution.

In some SADC countries, levy-grant mechanisms have been introduced to raise finance from employers. These too vary considerably in scope: from 0.5 % to 5 % of payroll, generating income ranging from less than USD 10 million to more than USD 1 billion per annum. There are concerns at both ends of this spectrum regarding how levies actually translate into training. In some cases, there are worries that too many employers treat levies as taxes and do not change their attitudes towards training; that levies are too small to support sustainable training agencies in poorer countries; and that small, micro and informal enterprises often

sit outside the system. Regrettably, there is too little robust evidence regarding the performance of levy-grant systems in the SADC region. It seems likely that there is much more private, community and employer investment in TVET in the region than can currently be captured by the data. A better understanding of the patterns of such investment might assist policymakers in learning what is publicly valued within the training system and allow them to better target resources.

Systemic reforms in TVET in the last two decades

Although TVET systems still remain weak in many SSA, countries have realised the need or systemic reform and are influenced by the packages that have become the international orthodoxy since early 1990s. Many have gone to implement these policies although progress still remains uneven. A study conducted in Southern African Development Countries (SADC) by UNESCO(2013) shows the following predominant features of these reforms:

- **Qualifications frameworks**

  Almost all the countries of the region have at least begun developing a national qualifications framework (NQF) and there is also commitment to developing a regional framework. Nonetheless, it is clear from the evidence across the region, where NQFs range from 20 years old to still being considered, that NQF reform is a complex and long-term policy process and needs to be understood as such. It is also apparent that there is little clear evidence yet on the impact of NQFs in the region. There is no consensus regarding the sequencing of NQF reform. It remains unclear whether it is better to get a vocational framework working well before contemplating the greater political challenges of including schools and universities, or whether a comprehensive model should be attempted from the outset.

  Although several reports make reference to ambitions for national frameworks to articulate with international qualifications, there is often silence on the issue of implementing the regional qualifications framework and it appears that most countries, at least implicitly, feel that they have more than enough to do in getting their national models working without concerning themselves with the regional dimension. Thus, whilst there is a case for a regional framework as a tool for maximising labour mobility in the region, it appears that regional harmonisation will concentrate for the foreseeable future on promoting dialogue across the region regarding what each country is intending, rather than seeking to be a vehicle for strong convergence of national approaches.

- **Quality assurance**

  Here too, there is a strong sense of commitment across the SADC region. Governments seem well aware that challenges of quality remain significant. QA systems and the distribution of quality assurance responsibilities differ. In some systems, a single quality assurance agency is responsible for a wide

range of quality assurance practices, while in other systems responsibility is distributed across several agencies, some of which are more limited in their role. Different agencies also focus on different quality assurance practices, such as exit assessment and certification; programme approval and provider quality improvement; or provider accreditation and assessment moderation. Furthermore, different agencies may perform similar quality assurance tasks but may do so in different parts of the TVET sector and/or in different kinds of provider agencies.

Even where QA systems are stronger, there is a wide range of approaches and a lack of robust evidence on their effectiveness. Some countries have sought to take a developmental approach to quality assurance, where the QA system pays considerable attention to capacity building of the providers that are expected to be on the front line of quality delivery. This appears to be a fruitful approach for others to explore.

- **Policy coherence**

  Part of the challenge of managing TVET is that it is inherently a cross-sectoral issue rather than falling easily under one governmental department. It is not surprising, therefore, that countries commonly struggle with TVET policy coherence. In response, a number of countries have reorganized areas of responsibility for TVET between ministries, have set up new inter-ministerial coordination structures or have linked TVET policy coherence to wider governance reforms by establishing national human resource development structures that include wider stakeholders. Equally, NQFs have been seen by many as a major tool for, or even a guarantor of, TVET policy coherence.

  Regrettably, though at present there may be evidence of why reforms have been initiated and what they are intended to do, there is a lack of any significant data on how any of these attempts at policy coherence have worked and whether they provide any lessons for other countries. Nonetheless, it seems likely that policy incoherence may be best overcome when there is a clear sense of a national vision for TVET and strong leadership of the policy coherence process.

- **National governance reform**

  Most countries record progress in this area. For example in some countries, TVET has moved from Basic Education to Higher Education. Training that used to be spread over Education and Labour Departments has now been relocated into one Department. However, it is more typical that reforms are under way rather than that they are fully realised. As was noted above, a number of countries had introduced new structures that encouraged both cross-governmental working and a stakeholder-based approach. Such ways of working are relatively new and the extent of the challenge both culturally and technically should not be underestimated.

  Whilst it is accepted that stakeholders should be involved in overall system governance, there is also a strong sense – particularly in the more developed

countries in the region – that the state has a legitimate and powerful role to play in national development and should continue to take an active and leading position in the development of TVET.

- **Employer involvement**

  The nature of TVET means that employers must be involved in significant ways. TVET reforms across the SADC region are driven by a strong concern to ensure training is responsive to, and relevant for, labour market and industry needs. Forging closer links to industry is advocated at both national and provider institutional levels, and across a wide range of activities from policy development to implementation; and from setting national standards based on occupational profiles to work placements as part of a training programme. However, whilst some countries report significant and formalised employer involvement in the TVET system, others can demonstrate little in this regard. Moreover, the evidence suggests that employers are typically more engaged at the national level than at the local level. As with other areas, there is a paucity of good evidence regarding what has worked and why.

- **Public provider governance reform**

  Whilst there has been noticeable progress in national governance reforms, changes in how public TVET providers are governed and managed are less widespread. In some cases, new governing councils have been established and more power has been given to these and/or institutional managers to make operational and even strategic decisions regarding TVET provision. In some cases, stronger QA systems and more clarity regarding key performance indicators have allowed institutions to be more accountable. However, as with such innovations internationally, it appears that there have been some problems in the early implementation of such reforms and some concern from officials that TVET providers are not using their new powers wisely.

  It appears that serious governance reform at the public provider level is something that comes later in the sequencing of reforms. This perhaps reflects the relative ease with which the state can attempt national-level reform and the relative lack of reach it has even in small countries in ensuring more local reforms. Nonetheless, provider level governance reforms do appear to be an essential element of any genuine and sustainable TVET quality improvement as it is at this level that the actual teaching and learning must take place. In particular, it may be that such governance reforms open up possibilities for public TVET providers to develop a collective voice that may also feed powerfully into national governance reforms.

- **Including private sector providers**

  Some countries in the region have revolutionised their attitude to private training providers and have moved from a position of hostility to genuine attempts to integrate them into a single national TVET system. There may be real benefits in other countries seeking to learn from such experiences. How-

ever, in general it appears that there is still too much official ignorance of and disinterest in private providers.

In some countries, the focus is more explicitly on what is termed non-formal provision. This is understood as being part of private provision, reflecting challenges of definitions, as some elements of non-formal provision have been incorporated over time into public systems.

Whilst governance, quality assurance and qualifications frameworks reforms should all assist in better thinking across the range of TVET provision types, it appears that this is not sufficient and that there is a need for a better understanding of all types of provision and how best the state should interact with them.

- **Decentralisation**

  There is a long-standing international orthodoxy that decentralisation of public provision is good. However, in some of the small states of the region the TVET system may be too small for decentralisation to have much meaning. In some of the more developed TVET systems in the region, a complex approach to decentralisation appears to be emerging in which local autonomy and greater responsiveness to local economic development opportunities and challenges should be balanced with the development of stronger national structures of curriculum development and quality assurance.

To **sum up**, the conditions in the political economies of many SSA countries do not allow for an expansive TVET system yet. Funding arrangements also reflect an extremely constrained situation to allow TVET to grow in many countries. However, there is a flurry of reform activities that have been noted in many TVET countries and many of these have been copied from international practices. These reforms do not seem to be making a significant impact in the expansion of TVET systems. As indicated before, TVET systems are not only small, but also weak. In the section below, we will interrogate the issue of weakness in this system.

A strong teaching core at the centre of a strong TVET system

The size of the TVET system does not necessarily mean that it is a strong one. But small size systems tend to be weak. They are weak because there is low level effort in their strategic direction as well as the funding investments. They are weak because the institutional capacity is weak. When they are weak, they tend to have a weak teaching core at the centre. Graduates of such programmes are often seen as being irrelevant or distant from what the 'employers' want. Students and their parents then percieve the quality of these institutions as being weak, not fulfilling their promise and they therefore vote with their feet and walk away as they see them as poverty traps(Van der Berg,2011). The reforms cited above have not made a significant impact in strengthening the TVET system in low-income countries.

Demand-oriented training does not only mean matching training offers quantitatively with demand, it means especially qualitatively matching of training offers to industry demand according to current occupational standards and/or curricula, demand-oriented training also depends on the quality of teaching-learning process strongly influenced by the quality of teaching staff and depends on the possibility of students to gain and/or practice required skills in a real or simulated work environment. However, existing teaching systems generally tend to provide similar pre-service training or the preparation of TVET teachers as received by their counterparts across the wider field of teaching (UNESCO, 2006, UNESCO, 2012, UNESCO, 2013 (b)). Moreover, many TVET teachers enter the classroom without the benefit of an industrial background, and having often lacked the opportunity to experience the world of work.

Largely, the professionalisation of lecturers is made up of initial training (UNESCO,2013 (b)) and takes place at universities (City & Guilds, 2012). Yet, everyone agrees that this model is not adequate. If the students to be taught need to learn about the science behind their chosen occupations, how to use the tools of the trade, experience how work processes are strung together in a real work environment and also be able to solve problems connected with the practices in their trade; these cannot be learned only at one place. This almost implies a network of institutions to provide for certain expertise in the development of competent lecturers.

A model of training teachers and lecturers in a network of institutions seems to be gaining favour at the moment. In realising that it is not only just one thing that TVET educators need, this emerging model tries to network a number of institutions for the production of TVET educator competences. For example the universities are brought in to teach the theory where appropriate, but more importantly to model the research approaches needed to map out the work processes. TVET colleges are brought in to teach the practical or functional aspects of TVET, e.g. use of tools, practice in fixing or making products. In workplace learning, students not only watch how the work is done, but learn to solve problems using TVET knowledge. This is the model that was being piloted in the Vet-Net project which involved four countries: Ethiopia, Germany, Mozambique and South Africa. In this project, it was recognised that the best TVET lecturers are the ones that have the capacity to teach their students skills to gather information, planning, executing tasks, problem solving and evaluation in performing their work related tasks than just teaching them how to perform TVET tasks. This approach needs a network of institutions and cannot be fulfilled in only one institutions. However, as convinced as we are about the merit of this approach to producing TVET lecturers, it is still a far cry from how TVET lecturers are produced in weak systems.

Social Justice and TVET

There is generally a wide acknowledgement that education for the young is not enough for any nation to meet adequately the socio-economic challenges in the

world. Specifically, all nations at the turn of the twenty first century are challenged by the notion of promoting economic prosperity and egalitarian societies. This challenge has become more and more pronounced since the collapse of the Cold war, blurring the boundaries and needs between the high and low income states (Sall, 2003). In other words, the need for continuing education seems to be growing in both high and low income countries as the worlds of political and economic systems continue to be thrown into doubt by a fast internationalizing world. It can be expected though that those countries experiencing most changes will also experience a greater need to step up their provision for everyone in order to prepare their citizen to deal effectively with a changing world.

Many SSA countries have a long history of 'insiders' and 'outsiders' throughout the different historical periods. A large underclass of unemployed and precariously employed, together with the dislocation of the transitions from apartheid to democracy – is generating fierce struggles over inclusion and exclusion both within the elite, between the elites and subalterns, and within the subaltern classes themselves. These struggles are in part marked by contestation over the meaning and content of citizenship. While the processes of class formation are producing what Hanson (2008) calls 'differentiated citizenship' – which distributes treatment, rights and privileges differentially among formally equal citizens according to differences of education, property, race, gender and occupations – subaltern groups respond by mobilising an 'insurgent, citizenship' around claims that 'destabilise the differentiated' (Kirsten & Von Holdt, 2011).

Bourdieu (1984) explains the way social divisions are reproduced and how 'insiders' and 'outsiders' are constituted. For example, in his classic work, *Distinction*, Bourdieu argues that class structure is reproduced through the accumulation of cultural capital, which can provide access to high-status occupations and social circles. According to him, a class society is reproduced because upper class students are more likely to have the cultural capital favoured by the education system (itself an agent of upper class). Central to this argument is the assumption that what constitutes cultural capital is agreed upon by all segments of society, or else there would be alternate markets in which those lacking legitimate cultural capital could succeed. Governments provide the primary base for elite formation, through the dispensation of skills development and jobs and tenders. Through the distribution of treatment, rights and privileges differentially among formally equal citizens there is an emergence of a 'differentiated citizenship' in the townships, rural areas and informal settlements. This differentiation has produced 'social distances', identified by Bourdieu in communities that had a history of sameness. For the citizens who have been waiting for their constitutional rights to be fulfilled in the form of housing, jobs, electricity, water, education etc., in the midst of corruption, nepotism and seemingly growing affluence for a few, it all boils down to justice being denied. Young people feel this exclusion more than any other groups as they are denied the means to transit from school to work.

If TVET has been used to exclude, now skills are being used by youth as a demand to include. Booysens and Crause (2014) describe these youth as living an existence

of "bleak monotony and pervasive sense of helplessness" and that such individual social exclusion compounds into national crises. It begins with an appalling schooling, which leads to a large number of drop-outs at the senior secondary phase and finally helplessness on street corners. This is inevitably continued into a cycle of substance abuse and teenage pregnancy. The adage "NEETs" (Not in Employment, Education or Training) sticks fast and the possibilities of breaking the cycle appear to be ever fewer. TVET will not solve economic problems of a country, but it will provide youth and workers a currency to bargain with employers as well as means to earn livelihoods.

The benefits of providing education at higher levels and to all citizens are numerous. Besides the objective of developing mental and vocational capacities of individuals, a highly educated society also has many other benefits. Research has, for example, shown that educated societies are generally healthier and more tolerant. An educated society has more capacity for reasoned thought, and the nurturing of culture and scholarship. In this vein Kennedy (1997) sees education as strengthening the ties which bind people, taking the fear out of difference and encouraging tolerance. In addition, it helps people to see what makes the world tick and the ways in which they, individually and together, can make a difference. It is the likeliest means of creating a modern, well-skilled workforce, reducing levels of crime, and creating participating citizens.

These are social justice imperatives that drive the agenda for providing TVET to most citizens. It means that the greater the proportion of the population that has completed secondary education and has acquired some skill to bargain with at the labour market, the better opportunity will be distributed in the population in general. Concentrating all energies and resources in the trickling effects of a growing primary education system, does not seem to be getting us to a point where educational opportunities are being distributed fairly in our society. Also, putting most of our resources in the university system still means the by-passing of millions of citizens. In order to equalise the opportunities given through educational access, much more effort must be put into the promotion of a completed senior secondary schooling and skilling citizens and access to Higher Education. This is the missing middle in our education and training system. The OECD (2014) report also states that in most high-income countries the majority of working people have acquired a post- secondary qualification, which might be one or two -year qualification after the completion of high school. Equality of opportunity is about levelling the playing field for everyone during key stages of life. A shift in the debate towards equality of opportunity in TVET promises to be a better guide for public policy and give similar chances to all citizens. TVET must be seen to be a public good for all.

Conclusion

In this paper, I have argued that the TVET systems in SSA are small as compared to their counterpart high income countries. I have argued that part of the expla-

nation of this smallness of these systems can be found in the political economies of these countries where the funding patterns have their origins in the political histories of such countries. I have also argued that despite the renewed commitment to expand the TVET systems in these countries, the funding patterns often do not correspond to this commitment. I have also argued that the TVET systems in these countries are not only small but weak. The weakness of the TVET systems stem from many factors but at the centre is a weak educator core. The weak educator core is a result of how educators are prepared to be professionals in order for them to build strong institutions. The resultant of all these problems is that the TVET system is not playing its meaningful role in bridging the transitions between schooling and work in most SSA countries. This I define it as a social justice concern as many young people have been denied the currency to bargain with employers as well as means to earn livelihoods.

The world of our young people is also one of very high youth unemployment and continuing economic change. It is a world in which employers value the skills learned in employment and the workplace, as well as those acquired in classrooms; and in which a substantial number of economically important and well-paid jobs, such as doctor, chef, or aircraft maintenance engineer, require skills acquired through demanding and vocationally specific study and training. Many of today's teenagers, like those of preceding generations, do not want to remain in academic programmes; they want to be in work, treated as (and earning like) adults, even though they may well return to study later. And a sub-group, because of personal circumstances, struggles to cope or engage with school or training of any sort.

We need to do far more, far more actively, to help young people to enter the labour market and obtain genuine employment experience. This will be the hardest task of all. Whereas the school-leavers of the 1960s and 1970s entered a labour market which was happy to offer young people a job, today's job market is very different. Some of this is beyond the power of any education policy to alter. It is a direct result of the ever-larger numbers who stay in fulltime programmes to 18, or 21, and of labour market regulations and policies which are beyond an education department's remit.

But there are things we can do, and they offer enormous benefits to young people in a world which values and rewards the skills learned in 'real' employment. We can prioritise and develop not only the growth of full apprenticeships, but also other forms of supported and subsidised workplace experience or employment. Increasing genuine employer involvement in the TVET system should also have important positive effects.

Would implementing this review end disaffection and under-achievement, raise the economic growth rate dramatically, abolish skill shortages, and ensure that every single vocational qualification had a positive labour market return? No, of course not. But raising the quality of provision, increasing the time spent teaching and thinking about students, implementing best approaches to teacher or lecturer

development, and reducing the money and time spent on pointless bureaucracy, increasing young people's skills in critically important areas, will make a real difference to young people's ability to obtain employment. All of which are, surely, well worth the attempt.

Lastly, going back to the Sustainable Development Goals, we started with, countries are not going to make significant progress in achieving these if they do not pay close attention to how they develop their people and at the centre of this is TVET. TVET is good for individuals and is good for countries to eliminate the problems of poverty, unemployment and poverty. Like all low income countries, SSA countries tend to have more in-country inequalities than high-income countries. We have challenges in health, environment, industry innovation, infrastructure, and more, and TVET can be a great contributor in solving these. The plus side is the age dividend in SSA which can be exploited to generate enormous economic growth. Therefore, good education is the best lever we have to give every young person a chance in life and this includes TVET. As long as youth feel excluded, we are in trouble. We will also not meet the SDGs without an expanded and strong TVET that can reach everyone who wants and needs it.

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Cross-country comparison of TVET systems, practices and policies, and employability of youth in Sub-Saharan Africa[1]

Moses Oketch

Abstract

In recent years, organisations such as the African Development Bank (AfDB), and several African governments have conceded that TVET may have a positive impact on harnessing the youth dividend. There has been some progress in some countries, but there is still insufficient understanding of the place of TVET and youth skills development. The criticisms of TVET in the past, and attitudes toward it, coupled with a period of neglect by governments and donors have all resulted in insufficient understanding of the positive effects TVET can have on the youth and on economic development compared to other regions of the world that have had clearly developed agenda for youth skills development through further colleges, community colleges, or apprenticeships.

Nevertheless, there are signs of renewed interest and possible progress, and some countries have started to put in place innovative policies to strengthen Technical and Vocational Education and Training (TVET) systems. But this progress is limited and hasn't been well researched and understood in comparison with other regions of the world. This is partly due to the past attitudes toward TVET, but may also result from limited understanding of the present positive role that TVET can play to harness youth dividend in the region. This paper aims to add to better and more research evidence on the role of TVET in youth skills development and employment in Africa using key economic and education highlights and the cases of Kenya, Ghana and Botswana by examining the policies and practices that characterize

1 This paper partly draws on Oketch, Moses (2014): Education policy, vocational training, and the youth in Sub-Saharan Africa, WIDER Working Paper, No. 2014/069. Contribution by Golo Henseke, particularly on the key highlights, is appreciated and acknowledged.

the TVET landscape across these Sub-Saharan African countries from a political economy approach.

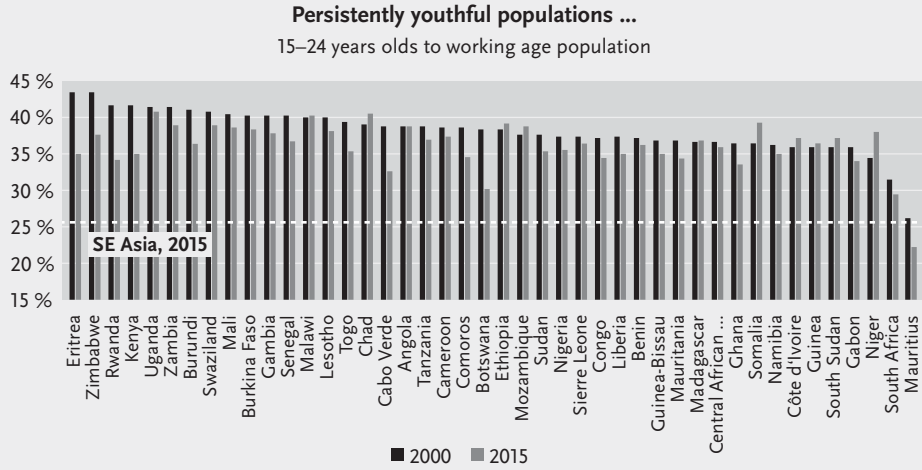
Introduction

Youth bulge and youth unemployment in Sub-Saharan Africa (SSA) has prompted a fresh consideration of the role of TVET in school- to- work transition. Eleven million youth are expected to enter the labour force each year for the next decade, 80 per cent of employment is in low quality informal sector, and whereas the formal wage employment is growing fast and will eventually employ more, seizing opportunity and scaling up informal sector to offer quality jobs is essential and urgent (Filmer and Fox, 2014). Previously TVET had fallen out of favour, especially within the international education investment discourse, and had been viewed especially by organisations such as the World Bank as expensive and inefficient public education investment, that had better be shifted to those demanding it and to the private sector providers (Bennell, 1998; Johanson and Adams, 2004). Now it is understood that it can make a necessary contribution to realising youth dividend in Sub-Saharan Africa, and in concert with other macro-economic factors, has a role to play in efforts to address youth unemployment and boost national economic productivity (AfDB, 2015).

AfDB has particularly been at the forefront in promoting TVET in recent years, the complete opposite of what its close partner but totally independent organisation the World Bank did during the 1980s when priority completely shifted from TVET to basic education. AfDB appears to highlight several roles for TVET under its strategic objectives for advancing youth dividend in the region. These include making the case for TVET as the means for developing skills that lead to jobs; and a direct financial support through loans for strengthening post-secondary TVET provision in areas of skills deficit in engineering and mining.

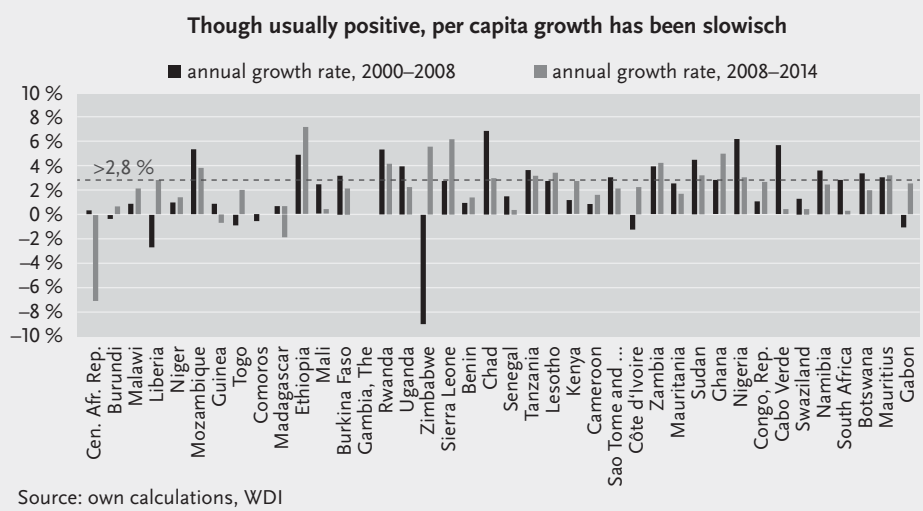
Against this background, this paper examines the policies and practices that have characterized the TVET landscape across three Sub-Saharan African countries of Ghana, Kenya and Botswana from a political economy perspective and comments on how TVET can be applied to remove what Hansen has described as restrained formal economic options for the youth in Africa (Hansen, 2015).

Context Highlights



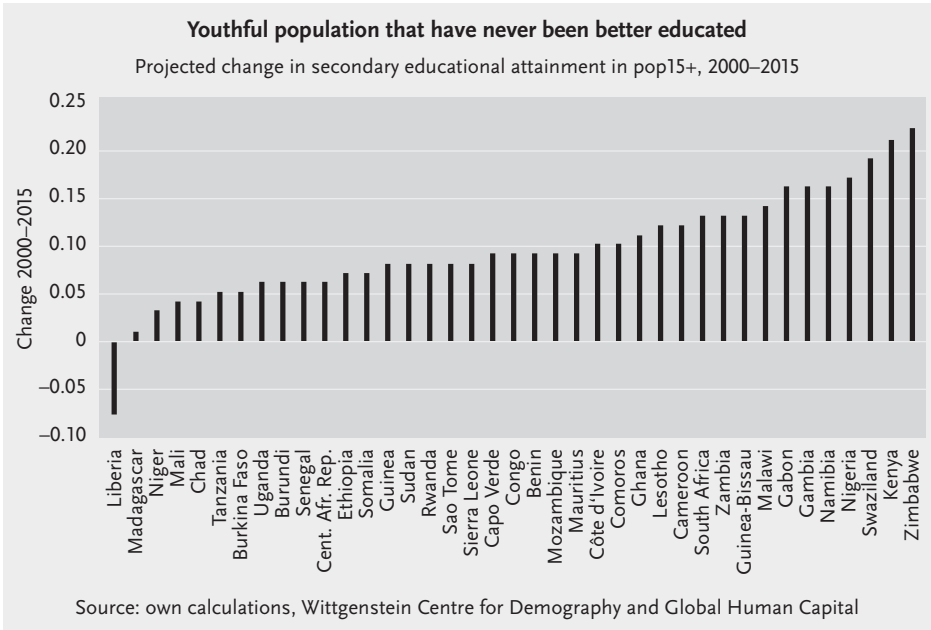
Source: own calculations, UN Population Estimates

The above Figure illustrates the very youthful population in SSA, which can be seen both as a source of hope and contention. Demographic dividend is the hopeful side but large investment into schooling is required in combination with sufficient labour market demand to leverage this demographic potential. There is also large youth bulges, which in some countries have started to decline. This is a sign that peaks have been reached and demographic dividend is kicking in.



Source: own calculations, WDI

Improvement in economic development has often been slow, but over the last decade, SSA has grown better than the world average. At current growth rates, some countries will manage to double GDP per capital within a generation (25 years).



Source: own calculations, Wittgenstein Centre for Demography and Global Human Capital

Despite strains on education systems in SSA and concerns about low quality associated with poor teaching methods and overcrowded classrooms due to past high fertility, populations today have never been better educated. The Figure above displays change in fraction of population 15 + with at least secondary education attainment. Apart from drop in Liberia, secondary education has expanded from a small one percentage point in Madagascar to over 20 percentage points in Kenya and Zimbabwe.

Source: own calculations, WDI

Despite improvement in secondary education attainment, employment is dominated by agriculture. Employment in agriculture often implies: 1) for individuals-mainly contributing family member and vulnerable work, underemployment, not full time, and poor skills usage. This is because most of the agricultural activity is subsistence; 2) for society- structural change towards more productive and innovative manufacturing and services sector inhibited.

At the same time African countries have been democratising since early 1990s, with elections, although not perfect now the norm. This political scenario together with the demographic and economic trends presented above has meant that youth in SSA hold an unenviable position. On the one hand, they are considered 'agents of change' driven by aspiration for better life as portrayed by their classification in the youth dividend, a term used to imply their potential present and future contribution to Africa's productive labor force, and on the other hand, they are viewed as 'a lost generation' who are trapped by their economic vulnerability' (Resnick and Thurlow, 2015). This is the context in which organisations such as the African Development Bank and several African governments have now conceded that TVET may have a positive impact on school-to-work transition.

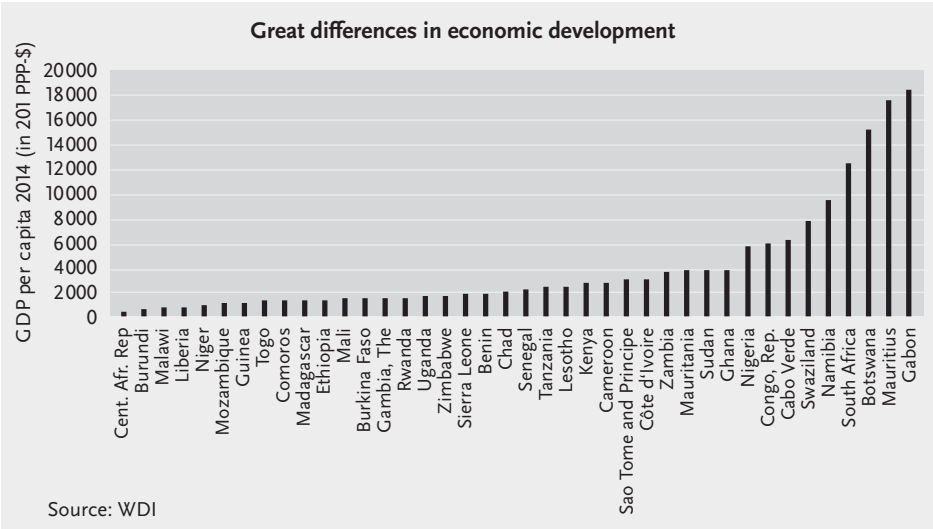
An overview of TVET trends in SSA

So far in most Sub-Saharan African countries, TVET has played a marginal role (Oketch 2015) despite recurring policy measures to combat youth unemployment and to promote economic growth through an expansion of TVET provisions. Enrolment in Vocational Education as share of all enrolled in secondary education is below 10 % in most countries. Several scholars have focused on the difficulties with the promotion of technical and Vocational Education and Training which is attributed to a number of issues, not least, its mismatch with young people's aspirations (Oketch 2007; Atchoarena and Delluc 2001; Foster, 1965; Biavaschi et al 2012).

Although TVET has a difficult standing in Sub-Saharan African countries, there is some evidence indicating that it leads to better integration into wage employment as a study on Ethiopia shows (Garcia and Fares 2008). There is also literature which have paid attention to the considerable share of self-employed (Aggarwal, Hofmann and Phiri 2010; Nübler, Hofmann and Greiner 2009).

The Case Studies – Ghana, Kenya and Botswana

There are great differences in the economic development of countries in SSA. The figure below illustrates this, but the three country cases in this paper, Ghana, Kenya and Botswana are among those that have shown improvement with Botswana way ahead of the other two. It is in this economic context that TVET reforms in the three countries is reviewed.



Ghana Case Study

TVET has formed an integral part of the education system since Ghana attained independence in 1957. Several reforms have taken place to align the education system with the needs of the society, but of these, the main reform focused on TVET integration in the education system was the 1987 reform which also changed the structure of the education system. Before the 1987 reform, the dominant provision at the secondary level was general education. The 1987 reform introduced pre-vocational skills programme made up of 12 subjects and pre-technical skills programme made up of 5 subjects (Akyeampong, 2005).

TVET was embedded within the Junior Secondary School (JSS) which now had a dual function: i) preparation of students for further Senior Secondary School (SSS); and ii) terminal qualification for entry into the labour market or self-employment. Greater diversification occurred at the SSS level. A significant feature of the diversified SSS curriculum was and still remains the case, the opportunity it accorded students studying different pathways to also select from other pathways. The combination was such that students in the TVET pathway could also select one or two elective subjects in science or languages such as French. It requires students to mix subjects as between general core subjects and TVET related subjects.

The reformed education system and the diversification introduced in the SSS was to address some of the challenges that had beset TVET in Ghana and to remove the dual track model by integrating TVET with general education, under what was referred to as a diversified secondary system. The merit of this was to encourage or allow those in the TVET pathway subjects to have the opportunity for progression into Further Education similar to those who were in the general pathway.

The reform expanded access as had been intended and helped to remove the impediments that had previously existed for TVET. At the JSS level, there was clear input into TVET and at the SSS level, there was diversification based on areas of strength and interests that students brought with them from the JSS. But even this attempt to integrate TVET and general education did not do the trick of amending the negative perceptions that had been associated with TVET subjects.

The attempt to introduce TVET early on in the system creates undesirable dual track and the attempt to diversify does not offer strong solution. The recommendation then is to strengthen liberal arts and science in the early years and allow for different pathways later on with the possibility for lateral and vertical movement. This does mean that the agenda for TVET in Ghana has to shift away from considering it as a means of coping with youth pre-vocational skills and those unable to transit into SSS, but rather that the foundation of all education up to JSS should be general arts and science and at SSS, serious TVET can be introduced. This would also mean that JSS is not terminal as such, but is the preparation for SSS where proper TVET skills can be instilled and those willing to proceed to university from the TVET strand can do so, and those wanting to join the labour market will also feel adequately prepared to do so.

Kenya Case Study

Since attaining independence in 1963, TVET has been viewed as a central pillar in addressing the issue of youth unemployment in Kenya. According to Mwiria (2005, p. 227) interest in vocationalising the secondary school curriculum dates back to the mid- 1970s and like Ghana, it was not until 1986 that the major reform to institutionalise vocational school curriculum was introduced. Similar to Ghana, this led to restructuring of the education system which introduced the current system known as the 8-4-4. This new system of education entrenched vocational curriculum right at the primary and secondary level mainly to equip the youth with pre-employment vocational skills. The system was changed from what was previously elite academic model of 7-4-2-3.

In terms of the curriculum content, the TVET under the 8-4-4 system comprised core vocational subjects and industrial subjects. The aim was to instill among the learners skills for self-reliance in self-employment ventures.

Mwiria (2005) offered an extensive review of the 8-4-4 system and its TVET character, looking at specific examples. He concluded with depressing comments: The whole policy change, including restructuring the education structure as was in Ghana‘s case ill-conceived to address the crisis problem of youth unemployment. “By blaming education for this [unemployment] crisis, education was made a victim for a problem it is incapable of resolving” (Mwiria 2005, p. 294). The causes of unemployment were not well understood and believing that TVET was the solution without first understanding the problem was in itself misplaced. Consequently the 8-4-4 system has been much criticised. Today the super elite simply don‘t want to follow the system and have enrolled their children in the inter-

national schools that basically maintained the elite British model. In the end, the 8-4-4 vocational content and requirements have been watered down so much such that its original vocational orientation has almost disappeared.

The Kenya vision 2030 that sets out priorities to make Kenya a middle-income country is promoting innovation and high level technical skills. It recognises the fact that the youth are Kenya's potential but it has no illusion similar to that which led to the 8-4-4 that simple integration of TVET in the education system will deliver the vision. It recognises rapid urbanisation and the need to create better jobs, to professionalise and expand the informal sector. This is much different from the 8-4-4 vision of TVET which was aimed as containing the youth in the villages and teaching them to appreciate agriculture.

Botswana Case study

Botswana is considered to have been successful in its implementation of TVET. Weeks (2005) attribute this success to Botswana's resistance to implement a full vocationalised secondary school curriculum. Instead Botswana opted for only providing some pre-Vocational Education through a limited number of practical subjects. Full-vocationalisation which Weeks (2005) defined as "the devotion of more than three to five hours a week to master trade of secondary schools is not possible in Botswana, nor has the government endorsed it" (p. 136). Botswana also invested heavily in TVET infrastructure because it had adequate resources and small population to do so (Weeks, 2005).

In 1977 and 1979 the first national Commission on education stated as follows "The purpose of the schools at all levels will be to prepare children for useful, productive life in the real world. They should have the basic skills of literacy, numeracy and the knowledge that will make them self-reliant later in life, whether they continue full-time schooling, study on their own, find employment, or become self-employed" (Botswana, 1977, p. 3 cited in Weeks 2005, p. 100). The first commission recommended that in senior secondary schools students should not take more than one practical subject. There was the clear belief that to take more than one practical subject might disadvantage a student when it came to tertiary selection (Weeks, 2005).

According to Weeks (2005) the second commission came about in the 1993−94 period and it simply re-affirmed the need to return to the 7-3-2 structure. It was aimed to guaranteeing universal access to basic education whilst consolidating vocationalising the curriculum content at the basic education level (Weeks, 2005). Botswana is unique in the sense captured by the comment from the second commission below, responding to criticism that it had not vocationalised enough:

"However, in terms of international trends it could be said that Botswana enjoys the advantage of having a senior secondary curriculum, which may be regarded as contemporary among middle-income developing countries as it has not suffered from, misdirected 'vocationalisation' efforts. The trend among middle-income countries is that emphasis should be placed on cognitive development, language,

mathematics, and science at the secondary level. **Training for employment should begin after education. Botswana is therefore correctly aligned in concentrating on the academic disciplines.** At the same time the key workplace-related subjects like Commerce and Design and Technology are being introduced (Botswana, 1993, p. 172 in Weeks, 2005, p. 100). In this regard, reforms in Botswana have been different from those of Kenya and Ghana.

As Weeks noted, it is recognised in Botswana that three to five hours a week on a practical subject will not usually lead to the mastery of what is required on the job or in self-employment. This is very different to what is happening in other countries where practical subjects were simply 'sold' to students and parents on the grounds that they will lead to employment, or if no jobs are available, at least to self-employment (King and McGrath, 1999; Lewin and Caillods, 2001 in Weeks, 2005, p. 138).

Botswana remained committed to systematically promote its pre-vocational education instead of trying to vocationalise its secondary schools. It also invested well in the facilities and human resources that supported this commitment. Even Foster who had been famous for writing the vocational school fallacy agreed in 2002, that Botswana had got it right, noting that Botswana had achieved "an appropriate structural and institutional environment" to support pre-Vocational Education in secondary schools (Foster, 2002, p. 28 cited in Weeks, 2005, p. 139).

Conclusion

To conclude, it could be argued that there are equally as many reasons why TVET in the education systems in Kenya and Ghana have failed as there are in favour of TVET integration. On the one hand there are benefits to increased TVET integration and initiatives that can have a positive impact on youth employability. On the other hand reviewed evidence suggest that there are negative effects to the way TVET has been implemented in the cases of Ghana and Kenya in the past and these effects have affected not only perceptions at the primary and secondary level, but TVET opportunities more generally, particularly because far from being a support for skills for jobs, TVET has trapped youth into dead end jobs without progression into higher levels of education or professionalised trades. However with these limitations in mind, it is potentially possible to reform TVET in order to realise Africa youth dividend, as shown by the case of Botswana. Firstly through addressing the capacity challenges by the renewed interest in TVET as shown by organisations such as AfDB, and clear national framework for TVET being put in place in countries such as Kenya where there is now a TVET Act, the contributions of TVET to addressing youth employability can be repositioned and nuanced so as to address the marginalised position of TVET within education system and for training.

Secondly the finance of TVET is also weak and the Kenya government 2012 draft framework for education under its 2010 new constitution acknowledges that the

government has paid and continues to pay low attention to TVET (MoE, 2012). The case of Botswana has highlighted the importance of adequate resources for TVET. The interest shown by AfDB to provide loans for TVET in Kenya and Ghana is a move in the right direction but more will be needed from national governments in terms of demonstrating priority for TVET by allocating adequate resources to the sector. Where private providers are more innovative and can offer functional and better labour market demand aligned TVET than governments, they can be supported through government fiscal incentives such as loans, and conducive policies that ensure growth and quality. Leveraging on public money to promote public-private partnerships in TVET provision can have "leverage effect" on TVET quality and relevance. Because private providers have been left to operate without government support and supervision, there are large variations in the quality of what is offered in the present private provision.

Some countries such as Botswana have a working framework for TVET. Several countries are now considering having similar framework to harmonise policy and practices. Where these frameworks exist, it is thought they begin to support integration of TVET as part of the plan to address youth employment. Compared to Kenya and Ghana, Botswana has arguably invested better in TVET and has thought through the TVET they wanted although the discussion in this paper has not matched this with evidence on actual youth employment in Botswana. This will require the next phase of this research to determine whether policies and trends deemed as appropriate, such as those in Botswana translate into better actual employability of youth with TVET qualifications. For majority of countries in SSA, TVET has remained desperately dysfunctional and inadequate to address youth unemployment and will require radical changes. Policies remain prescriptive with general statements about the potential of TVET, but these are immediately countered by system weaknesses and threats which simply render governments' capability in so far as mounting functional TVET inadequate, and the perception of relevance of TVET offered in government institutions is low among employers.

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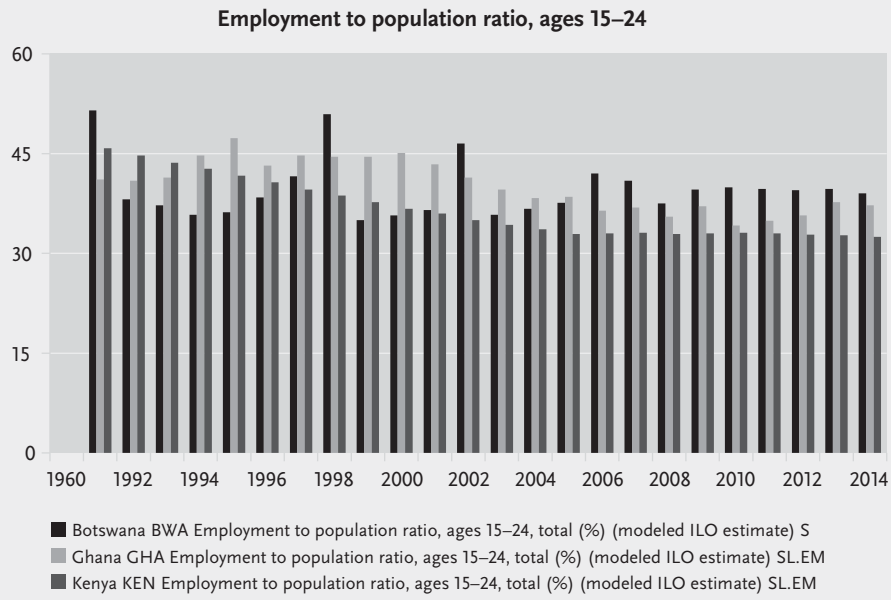
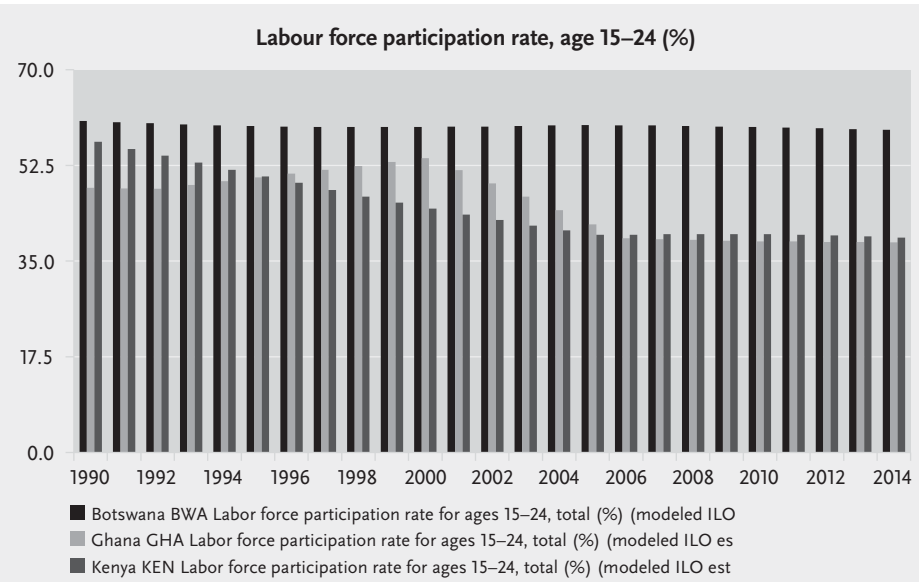
Appendix 1:
Trends in Employment, Economic Growth and School Enrolment- Botswana, Ghana and Kenya

Employment to population ratio, ages 15–24



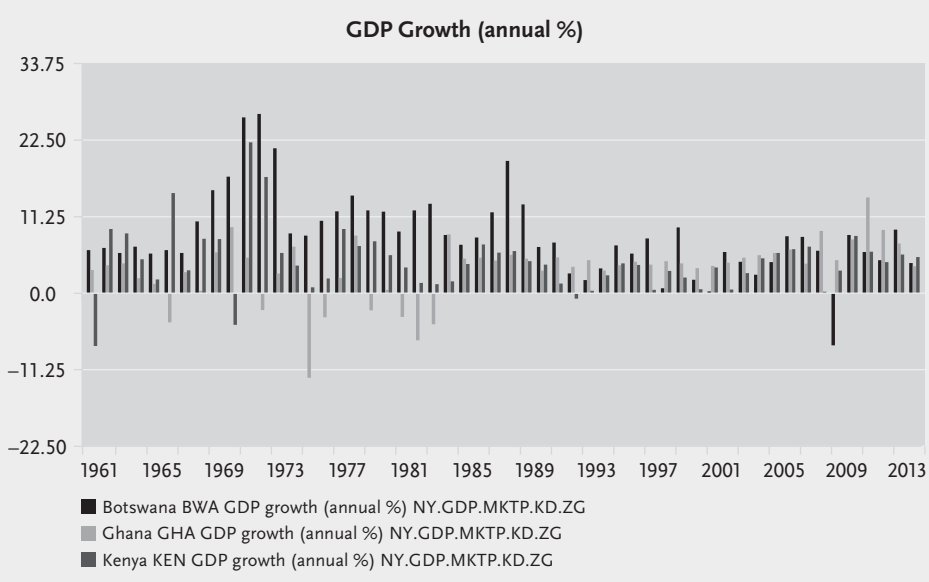
By author from WDI, World Bank

Labour force participation rate, age 15–24 (%)



By author from WDI, World Bank

GDP Growth (annual %)



By author from WDI, World Bank

Gross enrolment ration, secondary, both sexes (%)

Source: By author based on WDI, World Bank

Session 1

Vocational Education and Training – Basics for teaching and research in Vocational Education and Training at universities

Session 1 started with keynotes by **Peliwe Lolwana** and **Moses Oketch**: *Technical and Vocational Education and Training in Sub-Saharan Africa: the missing middle in post-school education* and *Cross-country comparison of TVET systems, practices and policies and employability of youth in Sub-Saharan Africa*. Both focus on the current situation of school graduates in Sub-Saharan Africa. Session 1 highlights the basics of Vocational Education and Training (VET). Each university has its own characteristics. The contributions seek to encourage various forms of VET. Challenges for universities and other institutions are emphasised. The contributions help draw conclusions for the Further structuring of VET in Sub-Saharan Africa.

Other country-specific articles from the session concentrate on the characteristics and orientation of VET systems, thereby helping create an overall picture of the status of VET in all participating countries.

Joy Papier presents a comparative study of the TVET Systems in **Cameroon**, **Egypt**, **Ghana**, **South Africa and Tanzania** in her paper *Re-Casting Technical-Vocational Education*. She touches on teacher education and Further Education as well as modalities for the trainees. The article highlights the importance of TVET and TVET personnel for economic development in all five countries. According to Papier, greater commitment is needed for successful development.

In their article *Dual Vocational Education and Training Systems in Europe: Lessons learned from Austria, Germany and Switzerland*, **Waldemar Bauer** and **Michael Gessler** present experiences from the dual VET system in **Austria**, **Germany** and **Switzerland**. Illustrating the different structures and organisation of the dual systems, the paper connects education, employment and the implications thereof for trainees on the labour market.

The article *Developing Lecturers at VET Institutions through Engagements with Industry: the South African Experience* by **Ken Duncan** discusses a recent initiative in **South Africa**, which aims to develop the technical and educational skills of university and college lecturers through cooperation with industry. The paper identifies the barriers that exist between training and the world of work. In addition, it shows how both sides can profit from an exchange.

Benjamin A. Ogwo argues in his paper *Models of university-based Further Education Programmes (FEPs) for Vocational Education and Training practitioners and the economic development of Sub-Saharan Africa* that the training at universities in **Sub-Saharan Africa** fails to meet the requirements of the labour market. He discusses four models of FEPs. Ogwo concludes that none of the models presented is able

to solve VET problems of Sub-Saharan Africa single-handedly and recommends a new, integrative approach that combines the models.

In *Applied Learning design in an online VET teacher-education course: A pedagogical framework that responds to the needs of mature-aged, employed students VET teacher-education in Australia*, **Jillian Downing** illustrates the experiences of the University of **Tasmania** in **Australia**. The paper discusses online VET teacher education with the focus on applied learning. The learning design principles and activities presented draw an authentic connection between theory and practice.

In her paper *Paradigms for Networking Universities and VET Institutions on CBET in Sub-Saharan Africa*, **Benadeth N. Ezekoye** describes the experiences of implementing networked CBET in **Nigeria**. She states the aims, strategies and structures of networks, including IT solutions. The article advocates a network between universities and the economy – with joint responsibilities and advantages for both sides.

In his article *Theory and Method of Reflection Levels – Its use in VET,* **Martin Hartmann** from **Germany** propounds the principles of his theory of reflection levels. The article emphasises that meaningful learning can only be planned if it is understood how trainees learn. Hartmann explains how the levels of reflection can be identified in complex processes from work and learning in companies and schools. The bottom line is that learning during training can only succeed if theory and practice are integrated. His article gives relevant examples.

Based on a recent study, in her article *Further Education for Technical Vocational Education and Training at Pedagogical University, Maputo,* **Brigida Oliveira Singo** reports on the challenges in TVET teacher education at the Universidade Pedagogica in **Mozambique**. She discusses the introduction of a model of extra-occupational teacher training that was developed with the support of international partners.

Gesine Haseloff presents a shaping competence-oriented Further Education sys, - tem in her article *The 'Train the Trainer-System' – Results of a research and development project for and with VET pedagogues in Sub-Saharan Africa*. The VET-Net project between **Germany, Ethiopia, Mozambique** and **South Africa** serves as the starting point. Taking the various initial qualifications of the programme participants into account, the model offers an extra-occupational education, flexible study times, free choices of modules and degrees from bachelor to master.

In his article *Fundamentals of the development of Vocational Education and Further Education of VET Pedagogues in Sub-Saharan Africa*, **Friedhelm Eicker** elaborates on the basics of Further Education in Vocational Education. Taking a constructivist basic position and scientific theory as his starting point, he illustrates his ideas on a concept for shaping competence-oriented VET. He explains in his article why shaping competence and networking leads to innovative and effective VET.

A comparative study of TVET in 5 African Countries with a specific focus on TVET Teacher Education

Joy Papier

Abstract

This article describes a five country (Cameroun, Egypt, Ghana, South Africa, Tanzania) study of 'TVET Teacher Education in Africa' that was commissioned in terms of an EU-South African collaboration in 2013[1]. While the focus was on vocational teacher[2] education, the contextual realities of each country's vocational systems was studied as this would impact on every aspect of vocational teacher development, for instance, what teachers would have to teach, who the students might be, how students would be expected to learn, available funding for Vocational Education and so on. Comparisons were therefore made over a range of elements that included the systems in place for vocational training, systems of vocational teacher education, and the modalities for training of VET teachers.

It is clear from the study that there has been recognition over the last ten years or more of the potential of Technical and Vocational Education and Training (TVET) for economic upliftment, poverty alleviation and improving employability, particularly for out of school youth and adults. There was evidence in the study of wide-ranging policies aimed at, inter alia, reform of TVET institutions, funding mechanisms, and TVET curricula, albeit that policies are at various stages of implementation. Concomitantly there has been acknowledgement of the role of teachers or trainers, and strategies for the development of competent TVET educators including new professional qualifications specifically for vocational teachers.

The study aimed to share knowledge of TVET systems across the five countries, within which vocational teacher development is taking place. In addition it drew on

1 EU, 2014, TVET teacher education in Africa. Synthesis Report. [Online] Available at: ec.europa.eu/education/library/reports/tvet-africa-report_en.pdf. Information for this article has been extracted from individual country reports by the writer, who was a member of the international report writing team and is an expert researcher on South African TVET.

2 Those who teach in vocational contexts are referred to, in the countries in this study, as TVET educators, vocational teachers, trainers, TVET practitioners, and college lecturers. These various terms were used interchangeably.

European member states' experience of vocational teacher training as examples of practice which may inform new policy initiatives that are envisaged. In its attempt to revitalize TVET on the African continent, the African Union Commission is presently trying to disseminate and advocate its Continental Strategy for TVET under the broader rubric of the Continental Education Strategy for Africa released in 2016. It is hoped that the comparative study described in the body of this article contributes to this endeavor.

Introduction

This paper is based on a five country study (Cameroun, Egypt, Ghana, South Africa, Tanzania) that was commissioned in terms of an EU-South African partnership in 2014. The study aimed to share experiences of good or emerging practices across the five countries as well as draw on European member states' experience, in order to inform policy dialogues on the continent that are attempting to re-cast and invigorate TVET. While the focus was on vocational teacher education, the contextual realities of each country's vocational systems was studied as this would impact on every aspect of vocational teacher development, for instance, what teachers are required to teach, who the students might be, how students would be expected to learn, available funding for Vocational Education and so on. Comparisons were therefore made over a range of elements that included the systems in place for vocational training, systems of vocational teacher education, and the modalities for training of VET teachers.

Using a multi-pronged methodology for the study, a country expert in each of the five countries prepared a country report based on a common set of questions that were to be addressed. Information for the questions was gathered through interviews with role-players and stakeholders in the vocational field, as well as the study of policy documents and empirical papers. Individual country reports were then submitted to a writing and review team who analysed the data thematically and compiled a composite report.

Country reports on Vocational Systems in Africa

This aspect of the study outlined key characteristics of the TVET system and its relationship to other educational sectors in each of the five countries under review

TVET systems

Technical Vocational Education and Training (TVET) in the five African countries was found to be located mainly at the secondary school level, extending into Higher Education levels. TVET provision was small in comparison with other education sectors, and was generally perceived to be a second choice option for school leavers and parents in relation to general education that provides routes to university.

There was strong evidence of recent policy development and legislation in TVET, and recognition in policy of TVET as a key driver of education and training that addresses skills development and unemployment. However, fragmentation of TVET systems across national departments is a feature of most countries, examples of which are set out below.

Public TVET in Cameroun is provided by three Ministries of Education: a Ministry of Secondary Education (MINEDUC), a Ministry of Employment and Vocational Training (MINEFOP) and the Ministry of Higher Education (MINESUP). In addition 14 other government ministries also make provision for TVET related to human resource development within their specific sectors. The country review notes that TVET is not centrally coordinated at a national level in most instances, with a few exceptions. Egypt for instance established a dedicated Ministry for TVET in 2015 to overcome fragmentation of the TVET system. Prior to this, the Ministry of Education was responsible for the majority of TVET provision together with the Ministry of Technical Education and Training. As this is a transitional period for TVET in Egypt, governance of TVET is still fragmented across numerous government departments and agencies. In 2012, Ghana amended the Council for Technical and Vocational Education and Training Act (COTVET) to provide a legal basis for the establishment and implementation of a national TVET Qualifications Framework and a Recognition of Prior Learning Policy. South Africa created a government ministry, the Department of Higher Education and Training in 2009, which includes adult education, TVET, workplace training and Higher Education. More recently, TVET has been transferred from a provincial mandate to a national mandate within the same Department as universities. Finally, in 2008, Tanzania consolidated its Vocational Education and Training Authority and National Council for Technical Education under the Ministry of Education and Vocational Training.

TVET provision is increasingly being aligned to outcomes-based and competency-based education quality assurance approaches and three countries are in the process of establishing a national qualifications framework (NQF) for TVET. South Africa has an existing NQF with three sub-frameworks within which Higher Education qualifications, TVET qualifications and occupational qualifications are located. Each of the five countries has developed strong international linkages to improve TVET systems. While many of these are related to international donors, there is also evidence of involvement in regional qualification frameworks and benchmarking TVET programmes to international standards.

Financing of TVET

Financing of TVET systems varies across countries and generally TVET funding is considered to be inadequate, ranging from around 1% to 4% of the national budgets. The majority of funding is provided through state fiscus, supplemented by student fees, albeit set at minimal levels. Most countries also show substantive donor funding for TVET projects but there is limited investment from the private sector. Recent, accurate data on TVET expenditure, enrolments and throughputs

are not readily available. South Africa and Tanzania currently have a 1% and 2% skills levy respectively on employers which is a training tax and contributes towards a national skills fund. In South Africa around 2.1 billion was allocated by treasury in 2014 for bursaries to TVET students.

Reports from all five countries raise concerns that current financing of TVET is insufficient for policy and developmental aims to be realised.

Policy Initiatives

Recent policies aimed at TVET in the reviewed countries reveal an increasing focus on competency based education and training approaches for TVET provision, workplace orientation for teachers and students, as well as capacity building interventions for teachers, many of which are donor driven.

In Ghana for example, emphasis has been placed on the introduction of Competency Based Training and workplace experiential learning. Donor funding has been used to identify demand-driven approaches to employability of TVET graduates and the use of new technologies. Another donor funded project is providing infrastructural support for TVET teacher training and upgrading competencies of faculty staff. In South Africa, the White paper on Post-School Education and Training (2013) aims to expand TVET enrolment to 2.5 million students by 2030 and a TVET lecturer education policy with minimum qualification requirements was released in 2014, resulting in universities engaging in development of new TVET specific qualifications for TVET college lecturers. In Tanzania, ICT and E-learning is seen as important interventions to improving access to TVET and there is a focus on re-introducing apprenticeship schemes and part-time modes of delivery.

TVET is seen as a key policy priority for each of the countries under review, although they differ significantly with regard to implementation of these policies. Recent policy reforms have been strongly influenced by international partnerships and donors, however, the African Union has been active for more than a decade in attempting to raise the profile of TVET on the African continent, as its 'Continental Strategy for TVET: To foster youth employment' indicates. TVET systems overlap with other educational sectors, government ministries and agencies, which make national coordination difficult, and a key focus of policy currently is to harmonise and bring coherence to TVET.

TVET Teachers — common themes

Country reports revealed cross-cutting themes with regard to TVET teachers, who in their own view have lower status than general school teachers, and are poorly remunerated compared with their industry counterparts. Vocational Education is still stigmatised as a 'second choice'/easier option for students who could not succeed in the academic track, and students expect to do more practical work in vocational programmes. TVET teachers thus have to cope with a range of learning

needs and student expectations in their classrooms which they have not received adequate preparation for.

General vocational teachers, for example those who teach foundational subjects such as language, mathematics or science, still experience a historical division from workplace related technical instructors or trades teachers. However, new policies on vocational teacher development appear to be bringing these two categories of vocational teachers into the same qualification pathways.

Initial teacher education is still strongly geared towards training of school teachers, even where institutions in Ghana and Tanzania for instance, are for training of TVET teachers. Only SA has gazetted new norms and standards dedicated to TVET teacher training through qualifications which, though not implemented as yet, take into account the specifics of Vocational Education and Training and differentiate general school teachers from teachers in TVET institutions. TVET teacher education is largely within the domain of university faculties of education, except for the MVTTC in Tanzania which is a general vocational teacher training college (as distinct from a Technical education teacher who is occupation focused), and the ENIETs in Cameroun.

The career pathways for a TVET teacher across the countries in the study are mostly undefined and confusing at present, with old or general teaching qualifications being phased out, or existing qualifications which are still focused on general academic teacher development. Vocational teacher training programmes do not clearly define a 'professional TVET teacher', apart from South Africa's policy on TVET teacher qualifications which signals a 'vocational pedagogy' for TVET teachers.

Workplace exposure or industry training is not yet a structured part of TVET teacher training, even though countries like Egypt and Tanzania recognise that this is desirable particularly for technical and practical instructors. In South Africa an external agency has been securing workplace opportunities for TVET college students and lecturers utilising donor funding, but this will still need to be taken to scale by becoming systematised and nationally funded. There was no evidence of organised industry involvement in the design of TVET or TVET teacher education programmes in the countries in the study.

Country reports point to instances of international cooperation around teacher development but there was not much evidence of internationally benchmarked TVET teacher qualifications. Furthermore, the local research base on TVET teacher education is still underdeveloped or emergent.

Teacher training practices in EU contexts

The following section highlights practices in EU contexts that may be informative for emerging policy on TVET teacher development elsewhere.

- Flexible entry for industry professionals into TVET teaching. For example, in the Netherlands, colleges evaluate industry professionals who have minimal teaching competence and they are able to commence teaching in the college

while obtaining a pedagogical certificate. The advantage of this is that the recent workplace experience and expertise of the entry level teacher is utilised in the college, while building professional teaching competence as well.
- Colleges have more autonomy to appoint their own staff, thus colleges can attract the kind of expertise that they need without official delays or barriers to appointments.
- In Sweden, continuing professional development is available for in-company trainers through online courses in pedagogy.
- Companies are incentivised to up-skill trainers, making teaching attractive, and these trainers could then become teachers in vocational colleges as well.
- In the Netherlands there is close cooperation between TVET teacher education and TVET schools, which enables the needs and expectations of both institutions to be taken into account.
- In Ireland new teachers are given mentoring and support by experienced colleagues, providing a bridge into their teaching career.
- In Finland vocational teachers are placed with employers in the workplace to enable continuous updating of teachers' industry knowledge.
- Denmark has an innovation fund for special projects which improve teachers' practices. Teachers are also viewed as change agents and are encouraged to reflect on their own practice.

In sum, these vignettes of international practices indicate an emphasis on strengthening industry involvement in TVET; on improving labour market information systems; on feedback loops between TVET colleges and teacher education providers; on continuing professional development for updating of TVET teachers industry skills and competences; and of giving TVET teachers some agency in their own education and in curriculum development at a policy level.

Conclusion

This article of limited scope has provided an overview of how TVET is organised and supported in 5 African countries. There is evidence in each of the country reports of increased levels of policymaking in TVET, based on a recognition of the potential of TVET for skills development towards poverty alleviation and building sustainable livelihoods. However, TVET still occupies a comparatively tiny slice of the national budgets, and is regarded as under-funded for the role it is being encouraged to play. Negative perceptions and stereotypes of TVET students and practitioners still prevail, and significant steps will have to be taken to eradicate these, largely by addressing issues of quality and attractiveness of TVET. While policy is attempting to bring about systems coherence in TVET, there is still much fragmentation of responsibility and reporting, resulting in poor data and accountability.

With regard to TVET teachers, this is a sector of the teaching cohort which is still finding its identity as training of vocational teachers has mostly been modelled on

school teacher training to date. In South Africa a new suite of qualifications specifically for developing TVET teachers has been developed, and will take some time to be fully implemented, however the policy recognises the unique identity of TVET teachers and the relationship they should have with industry. TVET teachers of the future will be required to be trained in pedagogy, in their subject knowledge, and have industry exposure/experience. This will assist in building respect for industry knowledge as well as academic knowledge relevant to TVET. Principles and practices that have been gleaned from international EU contexts illustrate strong industry-TVET college-TVET teacher training interrelationships, and demonstrate the positive recognition and esteem that TVET professionals enjoy in their teaching career. While only a few examples could be accommodated herein, they show the kind of cooperation which will be necessary to establish and enhance TVET and TVET teacher education systems in order that the aspirations for TVET may be realised.

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Dual Vocational Education and Training Systems in Europe: Lessons learned from Austria, Germany and Switzerland

Waldemar Bauer
Michael Gessler

Abstract

Due to economic crisis and high youth unemployment, skills development is a priority field in many countries. This is related to the considerable interest on the part of policy makers, and the close links between VET, economic strength and the social issues associated with employment. The current debate has caused an increasing international interest in the dual system in Europe and triggered a trend to transfer such VET systems, or parts of it, to foreign countries. In a comparative perspective, three dual models in Europe with a long tradition have been analysed (Austria, Germany and Switzerland). In our overviews, we have added two more countries: Netherlands and Norway. Because of the limited space, these countries are not covered in the in-depth analyse. The following dimensions have been derived: structure and governance of the Dual VET System. The comparison shows that Dual Systems can have different configurations: legislation (integrated/separated), role of the politics (unified/divided), competent bodies on the regional level (state/economy), representatives of the working world (social partners/professional associations), subsidies (yes/no), intermediate organisations (yes/no), vocational education and Higher Education (permeability/barriers) and training costs (benefits/loss). We can conclude from these observations that two different types of Dual VET Systems can be identified: An (1) unified Dual VET System under state responsibility with shared competence between state and economy (e.g. Switzerland) and a (2) divided Dual VET System under state responsibility but mainly directed by the economy (e.g. Germany).

Introduction

The purpose of this study is to examine those variables that most define and influence the characteristics and apparent success of dual VET systems. Hence, the analysing and comparing "VET systems" is a desideratum, but systematisation approaches are recent phenomena and suitable comparative methodologies have not been clarified in the international research community, yet (Grollmann, 2008). A comparative study of VET in different countries needs to consider broader social and political contexts, as well as the relationship between elements of the VET systems and their relationship with the education systems. VET systems are an expression of national traditions, social and cultural values and behaviour, economic and industrial structures, and political preferences and directions.

There are different attempts to classify VET systems. Raffe (1993) classified post-compulsory education and training systems (initial VET) into three types: provider-based systems that are characterised by a dependence upon education and training systems to provide entry-level skills for workers, work-based which leave the responsibility largely to industry or the workplace and mixed models that combine the two approaches. Other typologies use government intervention in education and training to systematise VET models and as the main criterion the "role of the state". Greinert (1988) distinguished three systems of VET: the market model, the scholastic model and the mixed model or dual system (state-regulated market model). The limitation of applying the concept VET system as *tertium comparationis* and the concentration on the macro-level of Vocational Education as mainstream are stated (Grollmann, 2008). Multi-level or multi-dimensional approaches are also discussed in literature; they include the didactical-curricular focus (micro level) and the learning environment or location and thus considering the learning or apprenticeship culture (e.g. Deißinger, 2004) These qualification styles may be named enterprise specific, knowledge-oriented and vocationally oriented.

As a consequence, the challenge in comparative VET research is the adequate dimensioning of various VET models considering socio-cultural, historical, political, economic and educational factors or variables. With respect to the topic of the paper, there are some empiric studies and other analysis. Rauner (2008) has analysed different dual (and other) VET systems focussing on the governance with two dimensions (integration of system and input-output). Euler (2013) listed eleven essential elements of Germany's dual system, which represent the key characteristics and analytic perspectives for transferring purposes. In another new publication from Austria (Petanovitsch, Schmid & Bliem 2014) seven success factors (such as social partnership; occupation-based VET approach; benefits for companies; attractive VET pathway for young people) have been identified for setting up a dual VET system in a successful and lasting manner. Reflecting the general methodological considerations and the specific studies in this comparison of dual approaches, the following dimensions have been derived: configuration of VET system, linkage of VET and education system and policy and governance of VET system. In a comparative perspective, three dual models in Europe with a long

tradition have been analysed (Austria, Germany and Switzerland). In our overviews, we have added two more countries, the Netherlands and Norway since these countries have dual systems, too, but with different organisations. Because of the limited space, these countries are not covered in the in-depth analyse.

Economic situation

Typically, dual systems are strongly related to the economic sector, because of the involvement of business. In order to illustrate this relationship, the following table provides an overview of the economic situation in the different countries by comparing the Gross Domestic Product (GDP) per capita and the unemployment rates (table 1).

The lowest youth unemployment rate can be found in Norway, while the smallest discrepancy between the total unemployment rate and the youth unemployment rate (for persons 15−24 years of age) exists in Germany (factor: 1.56). These data were also recognised by the OECD, which stated that "youth unemployment certainly tends to be less often a problem (relative to adult unemployment) in countries like Germany with strong 'dual' apprenticeship systems" (OECD, 2010: 34).

Tab. 1 Selected economic data

	Austria	Germany	Netherlands	Norway	Switzerland	OECD
Population (in thousands)	8,469	80,896	16,804	5,137	8,140	1,256,637
GDP per capita (in US Dollar)	45,133	43,282	46,749	65,635	56,897	37,815
Unemployment rate	5.9 %	5.4 %	7.2 %	3.3 %	4.5 %	7.5 %
Youth unemployment rate	10.6 %	8.4 %	12.4 %	8.2 %	8.6 %	15.5 %
Unemployment Discrepancy Factor	1.80	1.56	1.72	2.49	1.91	2.07

Source: OECD, 2015a; OECD 2015b; OECD 2016

The reason for the low youth unemployment rate seems clear: if the education system and the employment system are structural linked, the individual transition is much easier than it would be if the two systems were not linked or if they were opposite to one another. Another factor behind the low youth unemployment rate must also be recognised: the GDPs of the aforementioned countries are all higher than the OECD average. Such a strong economic situation tends to favour low unemployment rates.

Education System

Since VET system are strongly embedded in education systems, some basic characteristics such as the duration of compulsory education and the placement rates in dual VET programmes are described in this section.

Austria

In Austria compulsory schooling starts at the age of six and lasts for nine years. There are two types of schools at secondary lower level (lower secondary schools and academic secondary schools lower cycle). Then children can choose between two pathways, a vocational training track (vocational colleges, vocational schools and apprenticeship training) and a general education track (secondary academic school). About 40 % (120,000) of every age group in Austria are trained in legally recognised apprenticeship occupations in the dual system, another 40 % opt for a VET school or college, and 20 % continue at secondary academic schools.

Germany

The duration of compulsory (general) education in Germany is, in most German states (*Länder*), 9 or 10 years. General and Vocational Education in Germany is regulated on the regional level of the 16 states (*Länder*) as opposed to the federal level (there nonetheless exists a ministry of education on the federal level). Thus, the duration of compulsory education in the various states is not identical. Schooling normally begins at the age of six, and students are either 15 or 16 years old upon completion of their lower secondary education. In most German states, an additional three-year, compulsory, upper secondary education programme begins after this phase. Upper secondary education can be conducted either in general education or Vocational Education programmes; the latter is referred to as "compulsory Vocational Education". We can conclude, however, that there is generally an obligation to attend an upper (general or vocational) secondary education programme.

The percentage of students in upper secondary education, as categorised by programme orientation, expresses the important role of Vocational Education and Training. This figure specifically highlights the important role of the dual approach within Vocational Education and Training programmes: 52 % of students in upper secondary education attend general education courses and 48 % are enrolled in a vocational programme. Of this 48 %, 41 % take part in a combined school-based and work-based dual programme (OECD, 2015c, p. 317).

Switzerland

As in Germany, the education system in Switzerland is regulated on the regional level of the 26 cantons. Nevertheless, the duration of compulsory education is 11 years across the various cantons. Schooling begins at the age of four with kindergarten, and students are typically 15 years old upon completion of their compulsory education programme. In Switzerland, enrolment in an upper secondary education programme is not obligatory; however, if an apprenticeship contract is signed, the student must attend vocational school. In Switzerland, the state defines the rules for upper secondary education, and the various cantons are responsible for operating their schools within the framework established by the state government.

The percentage of students in upper secondary education, as categorised by programme orientation, expresses the superior role of Vocational Education and Training. This figure especially conveys the important role of the dual approach within Vocational Education and Training programmes: 34 % of students in upper secondary education attend general education courses and 66 % are enrolled in a vocational programme. Of this 66 %, 60 % take part in a combined school-based and work-based dual programme (OECD, 2015c, p. 317).

Tab. 2 Education System

	Austria	Germany	Netherlands	Norway	Switzerland
Political regional unit	9 Länder	16 Länder	19 provinces	19 counties	26 cantons
Start of Schooling	6 yrs.	6 yrs.	4 (or 5) yrs.	5 yrs.	4 yrs.
Duration of basic compulsory education	9 yrs.	9–10 yrs.	12 yrs.	10 yrs.	2 yrs. compulsory education in kindergarten + 9 years in school
Regulation following lower secondary education	1 yr. in pre-vocational or upper cycle in secondary school	Additional 3 yrs. of compulsory education	Compulsory education to 18 yrs.	Statutory right for additional 3 yrs. upper secondary education	Non-obligatory education
Percentage of students in upper secondary education by programme orientation*	GE: 30 % DV: 34 % SV: 36 %	GE: 52 % DV: 41 % SV: 7 %	GE: 30 % DV: 18 % SV: 52 %	GE: 48 % DV: 15 % SV: 37 %	GE: 34 % DV: 60 % SV: 6 %

* *GE=General Education, DV=Dual VET, SV=School-based VET, source: OECD 2015c: 317 (Austria, Germany, Norway, Switzerland); OECD 2014: 314 (Netherlands)*

The education system provides the framework and context for all VET programmes. The following section will provide a closer look at the structure of dual programmes.

Structure of the Dual VET System

One characteristic of dual programmes is the involvement of companies, which are usually responsible for the apprenticeship. In the traditional dual system, apprentices are attending vocational schools in addition to the in-company training. The root of this apprenticeship is based in medieval history, when guilds of craftspeople and artisans organised their sectors and regulated the educational and training process of becoming a journeyman and master. In the 19th century, additional vocational schools were established due to societal and educational policies. Apprentices were obliged to attend these new schools in order to expand their general education. Later, proper vocational subjects were implemented in those school types. This is the origin of the dual principle, which traditionally is based on the idea of conducting practical training in the company and imparting theory (and general education) in the school. In the case of Germany, the system was unified in a large conference in 1920 representing the current structure. Approximately in this period, the industry has started systematic training, too. Most dual

systems in German speaking countries are based on a similar tradition and structure, however regulations and governance differ. The different dual models are described in this section.

Austria

The dual training in Austria is an apprenticeship programme that encompasses two learning venues, the company (80 % of learning time) and the vocational school (20 % of learning time) with a 2−4 years training period. Training is based on more than 200 legally recognised apprenticeship occupations (*Lehrberufe*) in trade, commerce and industry, as well as in agriculture and forestry. The legal bases are set out in the Vocational Training Act (*Berufsausbildungsgesetz* − BAG). The Ministry of Science, Research and Economy (BMWFW) issues these training regulations as ordinances.

Training regulations contains the occupational profile, a training plan, which is a sort of a curriculum for the training company describing occupational skills and knowledge by training years to be achieved, and regulations for examination. For newly regulated apprenticeship occupations, activity descriptions are formulated, which lay down the occupational requirements the trained apprentice is able to meet. The national training regulations ensure a uniform minimum standard of training. Currently around 35,000 companies are involved in the apprenticeship scheme (ibw, 2014).

Enterprises provide training on a voluntary basis and at their own expense. Apprentices and employers sign an apprenticeship contract that forms the basis of vocational training in the dual system. Apprentices are obliged to attend VET school, either in day-release (1 or 2 days per week) or in block release (e.g. 6 weeks). The apprenticeship contract is submitted to the Apprenticeship Office, the regional competent body of the economic chambers, for recording purposes, who is also checking the suitability of the training company. The apprentice receives a remuneration by the company, which is fixed in collective labour agreements and varies according to the different apprenticeship trades (up to 80 % in the last year). The costs of apprenticeship training reduce the enterprise's taxable profits. There are some subsidisation options for apprenticeship training. Apprentices have full social insurance including health, accident, retirement and unemployment insurance.

At the end of the training period, the leaving or apprenticeship examination (*Lehrabschlussprüfung* − LAP) can be taken. This exam aims to test whether the candidate is able to appropriately carry out the activities necessary for the occupation. The exam comprises a practical and a theoretical examination (can be the prove of successful completion of the part-time vocational school). The exam committee comprises employer and employee representatives. The exam is organised by the regional economic chambers. A specific feature of the Austrian dual system is the double apprenticeship (*Doppellehre*); apprentices can achieve two similar occupational qualifications at the same time.

The additional curriculum of part-time vocational school is equivalent to the training regulation. The aim of part-time vocational schools for apprentices is to provide apprentices with the theoretical basics of the respective occupation to promote and complement company-based training and to deepen their general knowledge. The focus of education at part-time vocational school is on occupation-oriented specialist instruction (with about 65 %); general subjects make up some 35 % of the schooling period. Specialised instructions also include practical training in workshops and/or laboratories. The main criteria when it comes to defining the subject matter is its contribution to the improvement of the students' understanding of the real world and of the gap between legitimate claims and reality as well as the representation of Austria's political, cultural, economic and humanitarian achievements (ibw, 2014). Another special feature is related to the permeability of educational pathways. Graduates of apprenticeship training (and of other full-time VET schools) have the possibility to take the vocational matriculation examination (so-called *Berufsreifeprüfung*), enabling young people to combine the apprenticeship and upper-secondary school leaving examinations. This examination permits unrestricted access to Higher Education and universities.

Germany

The German dual model consists of alternating school-based courses (one to two days per week) with company training (three to four days per week). The duration of such programmes can be between one and 3.5 years and depends on the required level of knowledge and experience for an occupation. The standard duration, however, is 3 years.

A school leaving certificate is not necessary to enter the dual VET system. Rather, a signed apprenticeship contract with a company is sufficient. Nevertheless, only 2.9 % of all new apprentices do not possess a school leaving certificate. In comparison, 26.2 % of all new apprentices have already earned a high school certificate (and are therefore eligible to enter Higher Education), while 70.9 % possess a middle school degree (BIBB, 2016, p. 161).

In 2015, 804,369 German persons wished to enter into the dual system, but only 522,039 contracts were offered; thus, 64.9 % of applicants were successful (BIBB, 2016: 12). This problem has, unfortunately, existed for a considerable period of time. In the 1970s, with the motivation to improve the situation, parallel state financing was approved and the school-based VET programme was established as an alternative for young persons, who did not have the opportunity to earn a contract (Büchter, 2013). This "system for integration" or "transition system" has various purposes: students can (1) receive a general education school leaving certificate within the vocational programme; (2) upgrade an existing general education school leaving certificate within the vocational programme; or (3) try to gain a partial qualification in the hope that it will be taken into account if they are later granted a contract. Such recognition of prior learning, however, does not typically occur, and thus time spent within the programme is often wasted. Students are

regularly "parked" in the so-called "system for integration", which is less a system for integration than a system to hide the disintegration of individual groups (Greinert, 2003).

In 2015, 480,674 apprentices started an apprenticeships in the dual system (49.81 %); 204,174 apprentices attended a school-based VET programme (21.16 %), 9,350 were enrolled in a public VET programme (0.97 %) and 270,783 were placed in the transitional system (28.06 %). The discrepancy between people who successfully managed the transition (71.94 %) and individuals who were not able to manage the transition (28.06 %) is more than double than in Switzerland (12.4 %) (BIBB, 2016, p. 239).

In Germany, there are roughly 330 occupations that require dual vocational training regulated by the Vocational Training Act of 1969, which was updated in 2005 (BMBF). The federal authority that develops the training regulations together with the social partners is the Federal Institute for Vocational Training. The programmes are differentiated and oriented according to work requirements, however not all occupations are regulated by the Vocational Training Act or the Federal Institute for Vocational Training. For example, all occupations in the healthcare sector are regulated by special laws. Such healthcare sector programmes are also dual based, demanding a combination of theoretical and practical education; however, the employer, who is responsible for the practical education, typically also offers the theoretical education in schools owned by the organisation. The healthcare sector also offers one-year vocational programmes (e.g. nursing assistant courses). The Vocational Training Act, in contrast, requires a minimum of two years training (BMBF, 2005, p. 5).

Apprentices receive salaries from the outset of their programme. Basically, remuneration is based on the collective labour agreement in the sector, but depends on some factors such as the sector, the size of the company, occupation and years spent in the VET programme. Salaries range from 400 Euro per months in the first year (e.g. for a hairdresser) to 1.400 Euro per months in the final year (e.g. for a carpenter). On average, the salary of an apprentice is 62.1 % of the salary for a skilled worker (Muehlemann & Wolter, 2014, p. 13).

Switzerland

The Vocational Education and Training System is clearly structured and can be differentiated on various levels: (1) transition options, (2) two-year VET programmes for the Federal VET, (3) three-year or four-year VET programmes for the Federal VET Diploma, (4) the Federal Vocational Baccalaureate and (5) the University Aptitude Test (SERI, 2016, p. 7).

- Transition options (Level 0): These programmes are designed for individuals "who have been unable to immediately transition to [the] upper-secondary level. Such options include practical training and pre-apprenticeships and are generally designed to prepare young people for enrolment in VET programmes" (*ibid*).

- Two-year VET programmes for the Federal VET (Level 1): This programme prepares individuals for specific but simple occupations. These shorter programmes are especially designed for people with more practical skills. Apprentices who complete this programme can continue onto the next level. Achieved competencies are recognised, and thus the two years are not wasted if the student wishes to pursue a higher degree.
- Three-year or four-year VET programmes for the Federal VET Diploma (Level 2): This programme prepares individuals for specific and complex occupations. Apprentices within this programme can earn a Federal VET Diploma and an additional Federal Vocational Baccalaureate.
- Federal Vocational Baccalaureate (Level 3): Apprentices who are enrolled in a three-year or four-year VET programme for the Federal VET Diploma have the option to attend preparatory courses that cover general education subjects for the Federal Vocational Baccalaureate examination. The Federal Vocational Baccalaureate offers the possibility to continue education at a university of applied studies. Students also have the option of sitting for a University Aptitude Test (UAT).
- University Aptitude Test (Level 4): Apprentices with a Federal Vocational Baccalaureate can prepare for another examination, the University Aptitude Test. After passing this exam, apprentices have the option to enrol in a cantonal university or a federal institute of technology.

Within the different levels, the system is permeable and offers clear access and connection to Higher Education at universities. Nevertheless, 12.4 % of students cannot manage to acquire an apprenticeship contract after completing lower secondary education and thus pursue alternative transition options. This also means, that 87.6 % of students manage to earn an apprenticeship contract. After completing lower secondary education, 26.5 % move on to a baccalaureate school or specialised school on the upper secondary level (SERI, 2016, p. 11). This may be the result of free choice or might signify choice under pressure due to the unavailability of apprenticeship contracts.

Apprentices receive salaries from the outset of their programmes. The salaries for Swiss apprentices are lower than those granted in Germany. On average, the salary of an apprentice in a three-year programme is 50 % of the salary for a skilled worker; for apprentices in a four-year programme, the salary is 46 % (Muehlemann & Wolter, 2014, p. 13).

Tab. 3 Structure of the VET programme

	Austria	Germany	Netherlands	Norway	Switzerland
Entry requirements for a Dual VET	Signed apprenticeship contract with a company and 9 years of schooling. The training contract is registered by the apprenticeship office of regional Economic Chamber.	A signed apprenticeship contract with a company. A school leaving certificate is not required. The training contract is proofed and registered by the competent body (usually chamber).	VMBO diploma is required for admission to MBO levels 2 to 4. Contract with employer for BBL pathway.	School leaving certificate from lower secondary education.	A signed apprenticeship contract with a company. A school leaving certificate is not required. The training contract has to be approved by the cantonal VET office.
Duration	2–4 years	1–3,5 years	2–4 years	4 years	2–4 years
Dual Model	Alternating (1–2 days at school and 3–4 days at a company) or different organisation (6–8 week course block)	Alternating (1–2 days at school and 3–4 days at a company) or different organisation (6–8 week course block)	Alternating, work-based programme (BBL) at least 60 % in company, and the rest in VET college, day release (4 days in company, 1 day school), or block release	Sequential (2 yrs. of full-time schooling + 2 yrs. of full-time apprenticeship).	Flexible: (1) alternating (1–4 days at school and 4–1 days at a company), (2) digressive or (3) one year of full-time schooling in combination with alternating education and training in the following years.
Transition problems	No data available, probably not an issue.	In the beginning, students without a contract can move into the "system for integration" or the "transitional system". (28 % of a VET cohort).	In the beginning: students without contracts can choose other learning pathways in MNBO.	Transition problems occur between the 2nd and 3rd yr. Students without a contract can continue schooling.	In the beginning, students without a contract can move onto "transitional offers" (12.4 % of a VET cohort).
Occupations	220	330	More than 600 diplomas and qualifications in MBO (in reform)	180	230
Status of apprentices in the company and salary	In accordance with collective labour agreement for skilled worker up to 80 % of (last year).	Training contract in accordance with collective labour agreement for skilled worker (average 62.1 %).	Apprentices are employees of the company and paid in accordance with collective labour agreement based on age.	Apprentices are employees of the company, salary starts (in the 3rd yr.) with 30 % of a skilled worker and rises until 80 %.	Training contract; 3-yr. programme: in average 50 % of a skilled worker; 4-yr. programme: In average 46 % of a skilled worker.
Quote: Individuals who receive an apprenticeship contract after searching	Not available	60–70 %	Not available	64,9 %	87,6 %

Governance of the Dual VET System

Austria

Austria is a federal republic with nine states (*Bundesländer*). The Austrian Federal Ministry for Education and Women's Affairs (new BMBF, formerly BMUKK) is responsible for primary, secondary and tertiary education (including VET-schools). Tasks include funding, curriculum development; continuing and further training of teachers; school development and research on education, training and qualifications. The basic legislation is constituted in the School Organisation Act (SchOG) and School Instruction Act (SchUG). The curricula of the various school types are published by the BMBF as ordinances. At state level, certain authorities administer school education. Regional education boards are responsible for school inspection at provincial level at the upper secondary level (including VET schools).

For the enterprise-based training at federal level, the Federal Ministry of Science, Research and Economy (new BMWFW, formerly BMWFJ) bears responsibility (e.g. company-based training of apprentices and accreditation of professional qualifications) or other line Ministries (e.g. Federal Ministry of Health for schools for healthcare and nursing). The legal bases are laid down in the Vocational Training Act (BAG – *Berufsausbildungsgesetz*). For each individual apprenticeship occupation, the BMWFW issues a training regulation, which is binding for the training provided in training companies. The Federal Advisory Board on Apprenticeship (BBAB) is the representative body of the social partners (including VET-school teachers as advisory members) and submits expert opinions to the Ministry. At regional level, Apprenticeship Offices (economic chambers) are the responsible authorities for controlling and supervising the training companies.

The Austrian system of economic and social partnership is based on voluntary cooperation between statutory and voluntary interest groups and with government representatives. Statutory interest groups are representatives of the employers (Federal Economic Chamber), employees (Federal Chamber of Labour) and of agriculture (Standing Conference of the Presidents of the Agricultural Chambers). Voluntary interest groups include the Federation of Austrian Industry and the Austrian Trade Union Federation. Economic Chambers act as intermediate bodies and have specific responsibilities in the VET sector regarding controlling, examination and counselling such as accreditation of training company, organisation of the exam, award of qualification, providing consultancy for companies, financial incentives, publishing practical training guidelines. The occupational profiles and curricula of the different training regulations are negotiated between the social partners in the Federal Advisory Board.

Enterprises must be entitled pursuant to the Trade, Commerce and Industry Regulation Act to carry out training activities. Requirements are related to the scope of skills and knowledge of the relevant training occupations, equipment and personnel. A sufficient number of professionally and pedagogically qualified trainers must be available in the company. Those companies that cannot fully impart the

knowledge and skills of the training occupation have the possibility to train apprentices within the framework of a training alliance. Therefore, the company size is not limiting the apprenticeship training (ibw, 2014).

Germany

Statutory regulation documents establish the goals, content and timetable structures for Vocational Education and Training at the two learning locations. Companies are governed by training regulations and the vocational schools are regulated by framework curricula. There is no regulation that incorporates both spheres (e.g. an integrated training and education plan) or that is equally valid for both learning locations; this is likely due to the fact that Germany's federal structure and jurisdiction are shared between the federal and state governments.

The federal government is responsible for training regulations (usually the Federal Ministry for Economics and Energy) based on the German Vocational Training Act of 1969 (amended in 2005; covering among others the following apprenticeship trainings: Industrial clerk, Information Technology Specialist) or based on the Crafts Code of 1953 (amended in 2004; covering among others the following apprenticeship trainings: Electronics Technician, Carpenter). In accordance with Section 5 of the German Vocational Training Act or the Section 26 (BMBF, 2005) of the Crafts Code, the following five points must be established in a training regulation: name of vocation and recognised apprenticeship training, length of Vocational Education and Training (as a general rule, no longer than three years and no shorter than two years), vocational profile/training objectives (vocational skills, knowledge and abilities), structure of the apprenticeship/training framework (plan that includes content and timetable for passing on vocational skills, knowledge and abilities), examination requirements.

The vocational schools' curricula are made for the 16 states (Länder) by the 16 states' Ministries of Education. This means: There are currently approx. 330 recognised apprenticeship trainings with approx. 330 federal training regulations (first pillar) leading to 330 vocations. Due to the states' jurisdiction over their own education policies, each state could therefore theoretically issue its own curriculum (second pillar) for the school-based Vocational Education ($330 \times 16 = 5280$). This approach consumed in the past an enormous amount of time for each state (Land) and led to different school-based Vocational Education in the various states. For this reason the following system has been established: new and further development of curricula for Vocational Education in schools are coordinated by the Standing Conference of the Ministers of Education and Cultural Affairs (KMK), a voluntary coordinating body for the 16 state ministries without constitutional status (first congress in 1948). The developed curricula, so called KMK framework curricula, are subsequently adopted by each of the state ministries (usually without applying any further changes). The new and further development of training regulations for vocational training in companies is carried out by the Federal Institute of Vocational Training (BIBB; founded in 1970) on behalf of the Federal Ministry.

Although there is no single regulation for the two learning locations, in 1972 there has been a formal agreement between the Federal Government and the KMK (or state governments). This agreement specifies that the new and further development of training regulations and the new and further development of a KMK framework curricula are coordinated alongside one another and together with the relevant experts responsible for the regulations' new and further development. The experts from the Federal Institute of Vocational Training (BIBB) are generally representatives of employers' and employees' associations. That means that the training regulations for companies are developed by industry or craft representatives. The KMK's experts are generally teachers from vocational schools.

The formal-administrative agreement of 1972 constituted an important step in overcoming the formal duality of jurisdictions. The agreement was a necessary step for integrating the separate jurisdictions into one combined system and for it even to be called a dual system. It was a necessary step but it was not wholly sufficient (Gessler, 2016).

This operative role was granted to the chambers at the end of the 19th century. Thus, they control the companies and are responsible for the administration of final exams. Germany's dual system is therefore a company-based vocational training system with an additional compulsory Vocational Education component. This component consists of part-time schools, which are supervised by state authorities (Gessler & Howe, 2013).

Switzerland

In 2004, an updated Vocational Training Act brought major changes to Switzerland's educational sector. Following these changes, general education and Vocational Education became separate systems, as in Germany. Responsibilities were divided between different institutions and levels (national and local), again as in Germany. Since 2004, the two systems have been differentiated into the academic system and the non-academic system (general education, Vocational Education and education above and beyond company training). According to the new regulations, the central government has the responsibility to regulate all non-academic education that follows lower secondary education; this means that they control the education that occurs after the conclusion of compulsory education programmes. Changes to the state constitution, which occurred in 1999, were necessary to make possible this unified responsibility.

The new law declares that the central level, the regional level and the organisations of work (particularly the social partners and the associations of occupations) must cooperate with one another. Vocational Education is now integrated into the overall educational system but is simultaneously oriented towards company needs. Employability, work skills and the personal development of youth are equal goals. The combination of theoretical and practical learning has been integrated into school-based education and final certificates have been unified.

The two year programme, which concludes with the federal vocational certificate, was especially created for people with learning difficulties and disadvantaged persons. After completion of this programme, students may continue in a three- or four-year programme; thus, it is not a dead end. The federal certificate can also be earned without formal education—while competencies must be validated, a special examination is not necessarily required. Competence of prior learning is therefore recognised without discrimination.

Responsibilities are clearly defined for the three involved stakeholders: the confederation, professional organisations and cantons (SERI, 2016, p. 8–9).The confederation is responsible for strategic management and development and is tasked with:

- "Quality assurance and further development of the Swiss VPET[1] system
- Comparability and transparency of courses throughout Switzerland
- Enactment of around 230 VET ordinances
- Recognition of training courses for teachers, trainers, instructors and examiners within the VET and professional education sectors as well as training courses for vocational, educational and career guidance counsellors
- Recognition of foreign qualifications
- Payment of one-fourth of public sector expenditures for the VPET system
- Promotion of innovation and support for specific activities in the public interest"
  (SERI, 2016, p. 8).

Professional organisations are responsible for training content and apprenticeships and are tasked with:

- "Establishing the training content of VET programmes
- Establishing national qualification procedures for VET programmes
- Creating apprenticeship positions
- Developing new training courses
- Organising branch courses
- Managing VPET funds" (SERI, 2016, p. 9).

Cantons are responsible for implementation and supervision and are tasked with:

- "Implementing the Federal Vocational and Professional Education and Training Act (VPETA)
- Supervising apprenticeships and vocational schools
- Providing vocational, educational and career guidance services
- Creating options that prepare young people for enrolment in VET programmes
- Issuing permits authorising host companies to take on apprentices and/or trainees
- Apprenticeship marketing
- Providing training to apprenticeship trainers in host companies" (SERI, 2016, p. 8).

1 VPET: Vocational and Professional Education and Training

On the confederation level, there also exists in Switzerland the Swiss Federal Institute for Vocational Education and Training (SFIVET). This institute mainly provides training to teachers, instructors and examiners and is involved in research and innovation programmes. This role is therefore not comparable to the Federal Institute for Vocational Education and Training in Germany (BIBB). The BIBB is amongst other responsible for organising the development of new occupational profiles and training regulations or revising it, together with the social partners. Another general task of the BIBB is to contribute to vocational training research by means of scientific research.

The financial rules were also altered, and Vocational Education is now treated as general education; this means that subventions are no longer paid. Rather, Vocational Education is now a part of the system as a whole, and finances are calculated on the basis of output (how many persons where educated) and innovations (which contributions are necessary to improve the system). Aside from regular company contributions to facilitate the financing of company training, another tool was invented: sectoral vocational training funds. This new practice requires that all companies operating within the same sector (rather than only those companies who offer apprenticeships) pay into the sectoral vocational training fund. Organisations of work can apply at the state level to establish such a fund. This programme, however, does not represent automatism. For example, 30 % of companies within a given sector must offer apprenticeships. If this level is reached, a sectoral training fund can be established (Greinert, 2013).

The key facts are summarised in the following table.

Tab. 4 VET-Government Systems

	Austria	Germany	Netherlands	Norway	Switzerland
Legislation	Vocational Training Act 1969, latest version 2015, federal education regulations (incl. vocational schools) School Organisation Act.	Vocational Training Act 1969, amended 2005; Crafts Code 1953, amended 2004; additional laws for special sectors (e.g. health and care); federal states' education regulations; regional states' education regulations.	Adult and Vocational Education Act (WEB)	2006 Knowledge Promotion Reform; Education Act 2014	Vocational Training Act 1930, amended 1963, amended 1980, amended 2002
Competent bodies on national level	Federal Ministry of Science, Research and Economy (or other (line ministries); Ministry of Education and Women's Affairs for VET schools.	Federal Institute for Vocational Training (BIBB) for companies on behalf of the Federal Ministry; Standing Conference of the Ministers of Education and Cultural Affairs & ministries of the 16 Länder for the schools.	Ministry of Education, Culture and Science.	Ministry of Education and Research, consulted by the National Council for VET, Directorate of Education and Training.	State Secretariate for Education, Research and Innovation (SBFI).
Competent bodies on regional level	Regional Economic Chambers; Apprenticeship Offices	79 chamber of industry and commerce, 53 chamber of crafts, 7 chamber of agriculture and other bodies (e.g. for health and care).	Cooperation Organisation for Vocational Education, Training and the Labour Market (SBB)	19 Counties, consulted by 9 VET programme councils.	26 cantonal VET offices, supported by the Swiss Federal Institute for Vocational Education and Training.
Industry representatives	Training regulation is negotiated between social partners in the Federal Advisory Board; administration and competent body: economic chambers act as intermediate bodies.	Industry representatives (social partners) develop under the monitoring of the BIBB new occupational profiles and training regulations; at local level employers are represented by the chambers.	Sectoral level by centres of expertise on VET and labour market (social partners & VET), national coordination by SBB.	Industry representatives are present in councils on the national and regional with an advisory function.	State, Cantons, Employers associations and organisations of work have to cooperate by law together on all levels (especially professional associations).
Financing	Cost of training financed by companies (subsidies available); vocational schools financed by public (federation and states).	Cost of training financed by companies (25.6 bn gross cost, 7.77 bn net cost); cost of vocational schools public (federal 0.65 bn, Länder 2,8 bn).	Wages for apprentices paid by companies; subsidies for companies to cover costs of offering learning places in dual tracks are available; MBO colleges funded by government.	The state finances school education and each training company (15,000 Euro per apprentice).	Cost of training financed by companies (5.8 bn gross cost, 0.5 bn net benefit); cost of vocational schools by public (State (0.74 bn, all Cantones 2.2 bn).

Conclusion

The comparison shows that Dual Systems can have different configurations:

- Legislation (integrated/separated): in some countries (e.g. Switzerland) one integrated vocational training act regulates the entire VET System. In others (e.g. Germany) many separated acts (e.g. vocational training act, education acts of the 16 Länder, Nursing Act) regulate the VET System.
- Governance (unified/divided): in some countries (e.g. Switzerland) the responsibility for the VET-system is unified at the national political level. In others (e.g. Germany) the responsibilities are divided: different entities have just partial responsibilities.
- Competent bodies (state/economy): All the countries control the system on the regional level but the competent bodies are different: the VET-System is in some countries (e.g. Switzerland) controlled by state institutions; in others (e.g. Austria, Germany) it is controlled from representatives of the economy (usually chambers).
- Representatives of the working world (social partners/professional associations): in some countries (e.g. Austria, Germany) social partners (employer associations and trade unions) are the central representatives of the working world; in others (e.g. Switzerland) the major representatives are professional associations (nevertheless employer associations and trade unions are usually involved, too).
- Subsidies (yes/no): in some countries (e.g. Austria) certain subsidies are available, whilst in other countries (e.g. Germany, Switzerland) no subsidies are paid to companies.
- Intermediate organisations (yes/no): in some countries (e.g. Austria, Germany) exist intermediate organisations (e.g. chambers) between the state and the economy; in others (e.g. Switzerland) this intermediate organisation does not exist.
- Vocational Education and Higher Education (permeability/barriers): in some countries (e.g. Austria, Switzerland) the apprentices can prepare themselves within or at the end of apprenticeship for an examination enabling access to Higher Education. The system is therefore permeable. In others (e.g. Gemany) a fulltime course following the apprenticeship is necessary to receive Higher Education access. The system therefore creates education barriers.
- Training costs (benefit/loss): it is assumed, that apprentices are also productive. This production contribution reduces the gross costs of the companies. In some countries (e.g. Switzerland) the profit is higher than the costs. The companies receive on average a net benefit from the system. In others (e.g. Germany) the profit is lower than the costs. The companies receive on average a net loss from the system. This causes the question what type of apprenticeship or dual training is economically efficient.

It can be concluded from these observations that two different types of Dual Systems are identified: (1) An unified and coordinated Dual System under state re-

sponsibility with shared competence between state and economy (e.g. Switzerland) and a (2) divided Dual System under state responsibility but mainly directed by the economy (e.g. Germany).

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Developing Lecturers at VET Institutions through Engagements with Industry: the South African Experience

Ken Duncan

Abstract

This paper provides an overview of a current initiative in South Africa aimed at developing the technical and pedagogical competence of lecturers at public VET institutions through regular exposure to industry.

The calibre of the trainers and instructors is widely recognised as an important determinant of quality in any Vocational Education and Training (VET) system[1]. High-quality instructors produce highly skilled graduates and, subsequently, productive workers. Three aspects of the instructor's competence profile are considered especially significant, namely:

- Technical knowledge and skills
- Pedagogical skills
- Current and relevant industry experience

The current corps of lecturers in South African technical and Vocational Education and Training (TVET) colleges is weak in all three respects.[2] For example, a 2009–10 survey of lecturers in two provinces, Gauteng and KwaZulu-Natal, found that only 43 % had both a technical qualification and industry experience, 26 % had neither a technical qualification nor any industry experience and 29 % had no teaching qualification or experience. The researchers linked the lecturers' experience of practising their trades in the workplace to the quality of their instruction and their ability to prepare their students adequately for the world of work.[3] Given the low levels of technical qualification and industry experience, it is clear that a

1 Morrow (2007), Rauner (2012) and Wedekind (2016)
2 OECD (2014), Gewer (2013), NBI (2011), Bantwini & McBride (2011) and McBride *et al* (2009)
3 Wedekind & Watson (2016; p76)

massive, sustained effort will have to be made to upgrade lecturers in South Africa's TVET colleges. This may also be true for Namibian technical colleges, which prior to 1990 were modelled on their South African equivalents.

Internationally, evidence suggests that providing workplace exposure for teaching staff at VET institutions helps to bring the classroom curriculum into closer alignment with the skills needs of industry, motivates the lecturers to 'raise their game' and generally promotes long-term cooperation between college and company[4]. For this reason, several SA government policy documents – including the *National Skills Development Strategy for 2011–2016*, the 2011 *National Skills Accord* and the 2014 *White Paper on Post-School Education and Training* – have recently emphasised the importance of workplace exposure for lecturers. The 2013 national *Framework on Professional Qualifications for TVET Lecturers* makes experience of workplaces in the industry for which the lecturer is training a requirement for professional qualifications.

Real workplace experience is essential to both students and college lecturers because there are important differences between the world of the training institution and the world of real work for which students are supposedly being prepared. Some of these differences are summarised in the following table:

World of Training	***World of Work***
A sheltered environment designed to facilitate learning	An exposed environment designed to maximise productivity
Tasks are graded to match the student's level of competence and presented in ascending order of difficulty	Tasks arise in random sequence and are assigned in order of their urgency or priority
Support to perform a task is usually available	Little or no support is available: every worker is expected to complete all assigned tasks independently
Performance is assessed by a trainer who is primarily looking for evidence of progress on the part of the trainee, within a broad range of norm-referenced standards	Performance is assessed by a supervisor whose duty is to ensure that all work is completed... • exactly to specification • on time • within the budget
There are few and limited consequences to under-performance; in most cases, the trainee is given another chance to perform the task.	There are many serious consequences to under-performance, including loss of earnings, hostility of colleagues, demotion and dismissal

Compared to the training institution, then, the workplace is a hostile place – a kind of 'red zone' – for which students must be adequately trained. College lecturers cannot do this if they have not themselves had recent experience of working under real-life conditions. On the other hand, lecturers who do spend time in industry draw a number of benefits, including:

- Acquisition of current industry knowledge, skills and experience through exposure to industry experts
- A better understanding of industry needs and of the strengths and weaknesses of the college curriculum in relation to these

4 Bukit (2012), Clayton (2012) and Schüller & Bergami (2008)

- An increased capacity to link the theory and practice specified in the curriculum to their application in industry and to provide relevant examples of this during teaching
- Increased networking opportunities and the development of useful contacts with industry

Recently, two factors – one a push, the other a pull – have served to promote both pre-service and in-service industry experience for TVET college lecturers:

I. In June 2013, the Department of Higher Education and Training (DHET) adopted a new set of professional qualifications specifically designed for TVET lecturers. Since each new qualification requires a specified amount of industry-based professional experience, new entrants into the lecturing corps and current lecturers who seek to improve their qualifications will all spend some time in industry as part of their studies.

II. Since then the DHET, as the employer of lecturers in public TVET colleges, has been in negotiations with lecturers' unions on the introduction of a points system for quantifying and recording continuous professional development – including time spent in industry – undertaken by lecturers. Thus, even if a lecturer is not studying towards a formal qualification, he can obtain recognition for industry experience that could count towards promotion, salary increases and other kinds of career advancement.

Against this background, in 2012 the Swiss-South African Cooperation Initiative (SSACI) initiated a pilot project aimed at improving the technical knowledge and skills of lecturers in public TVET colleges through short periods of work-integrated learning (WIL) in industry. SSACI is a non-profit, public-private partnership aimed at strengthening the national skills training system in South Africa. In pursuit of this objective, SSACI has a four-legged strategy of:

- Linking public TVET colleges to industry
- Initiating and implementing proof-of-concept projects in skills development
- Catalysing government initiatives and supporting their implementation
- Feeding lessons from these interventions into government policy and programmes

In 2012–13, SSACI worked with ten colleges to:

- Conceptualise industry-based WIL for TVET college lecturers and their supervisors (e.g. heads of academic departments and campus managers)
- Profile different categories of lecturers in terms of background, qualifications, skills and work experience, define what sort of industry experience would be beneficial to each category and decide how best it could be acquired
- Understand the college context, including lecturer employment issues, current staff development policy and practice, implementation issues, concerns and requirements

- Understand the situation in the industrial workplace in which lecturers will be placed, including employers' interests, expectations and concerns
- Integrate lessons learned from industry placements into the college curriculum

Once a model for industry-based WIL for lecturers had been developed for the systematic implementation by colleges, the project was extended in 2014–16 to another 18 public colleges with funding from the parastatal sector education and training authority for the education and training sector. In total, to date[5]:

- 28 public TVET colleges have been assisted to develop and implement standard policies and procedures for implementing industry-based WIL
- An instructional manual, guidebooks for colleges and companies, and templates for related documents have been developed
- Over 650 lecturers have undertaken industry placements

During the second phase of the project from 2014 to 2016, additional attention has been paid to:

- Investigating how lecturer placements in industry can be implemented within the new professional qualifications being developed for lecturers by universities
- Building capacity in the public skills development system by, for example, advising ETDP SETA staff on how to support colleges on the implementation of LWE implementation

In conceptualising and designing industry-based Wil for lecturers, SSACI was guided by the following principles:

- The lecturers' time in industry must result in clear benefits to all participants, namely the lecturer, the college and the industry employer
- Lecturers should take responsibility for planning and organising industry engagements as part of their own professional development
- The nature and length of the lecturers' industry engagements should fit their purpose
- Time spent in industry must not disrupt teaching
- Lessons from industry engagements must be integrated back into the curriculum

These principles led naturally to the adoption of a standard, four-phase implementation cycle, as follows:

i. **Planning**, which includes the development of a college policy on industry placements for lecturers, a budget, specific plans for recruiting host employers, assigning and replacing lecturers, and recording and reporting experience.
ii. **Preparation**, which includes helping lecturers to draw up individual programmes, matching lecturers to suitable workplaces, briefing host-employers and making the necessary logistic and administrative arrangements.

5 Smith (2016; p. 9 & p. 30–32)

iii. **Engagement**, i.e. spending time in industry to meet with practitioners of the occupations for which the lecturer is training college learners, study equipment, systems and procedures, and perform pre-arranged work assignments; an engagement may range in length from a week to several months but, in all cases, a record must be kept in the form of a logbook or journal of what was done, when and to what end.

iv. **Post-engagement reflection**, through which the lecturer writes up his experience in the form of reports to college and company management, thinks about what he/she has learned from that experience, develops a plan for integrating the learnings into classroom teaching and the college curriculum, and generates some ideas for future, follow-up engagements.

Experience gained through the implementation of the project in 28 colleges to date suggests that:

- Exposure to the industrial workplace develops, motivates and energises lecturers: they learn a lot about current technology, industrial systems and processes, feel empowered by that experience and usually want to experience more.
- This learning often supplements and enhances what the lecturers know already rather than leads them into entirely new learning areas.
- While the lecturers' knowledge and understanding of their target industries is usually improved by their time in the workplace, they are seldom there long enough or perform sufficiently demanding work there to develop their own technical skills; this aspect of their competence therefore remains both a problem and a priority for many lecturers.
- Industry exposure by even a few lecturers in a college has a noticeable 'ripple effect' on the wider department or faculty. Participants talk informally to their colleagues about the benefits they have received from their experience and this motivates colleagues to try it as well. Spending even a little time in industry becomes a matter of professional pride and status.
- Putting lecturers into industry fosters broader and deeper relationships between college and company.

Lecturers integrate experience from the workplace into their teaching through a range of strategies and processes, including:

- Revising lesson plans to incorporate real-life examples and case studies
- Supplementing core curriculum with content not prescribed but relevant to industry
- Simulating the workplace in the college, e.g. in the layout of workshops and in the organisation of complex, multi-stage tasks that require sequenced inputs like those on a production line
- Assigning students activities similar to those in industry
- Assessing performance by industry standards
- In-sourcing real work for students
- Sharing information and experience with colleagues

No single lecturer uses all these methods, nor can all of them be found in a single participating college. However, in all colleges in the project, combinations of at least some of these methods can be found, indicating that integration of lessons from industry experience into classroom teaching is happening at the level of the individual lecturer, though not yet systematically or institutionally.[6]

Experience to date also shows that:

- Tailoring lecturers' engagements with industry to their training needs is complicated. The interests and needs of lecturers differ widely, especially between those teaching fundamental subjects like mathematics and language, those teaching general technical subjects like electricity and physics, and those teaching specific artisan trades. Thus, there can be no standard itineraries or programmes for industry engagements. Each one has to be individually planned and organised.
- The demands on college management are significant. They include:
  - Finding suitable workplaces for lecturers to spend time in (which is especially challenging in rural areas) and tasks for lecturers to perform while there
  - Setting priorities and devoting college resources in such a way as to be fair to different campuses, programmes, post-levels and personnel, yet at the same time use limited resources efficiently and effectively
  - Making logistical and administrative arrangements, including travel, accommodation if necessary, insurance, communications, recording and reporting, and the temporary replacement of staff on placement in industry
  - Managing the differences in organisational culture between colleges and companies; these are particularly pronounced when it comes to working hours, dealing with authority and etiquette in meetings

Finally, it needs to be acknowledged that there is no tradition in South African industry of hosting college lecturers for industry experience. To bring companies on board in the required numbers will take a great deal more lobbying and advocacy amongst businesspeople, trade unions and legislators. Above all, the *business* case for industry-placements of lecturers – that is, what's in it for the *company* – needs to be made much more strongly. That case includes:

- the opportunity a host-company has to influence teaching and learning programmes at the local college in such a way as to address the company's skills needs directly, thus ensuring a steady supply of appropriately skilled employees and, at the same time, reducing future costs of recruitment, induction and in-house training
- earning points on the company's Black Economic Empowerment scorecard, which is essential for companies supplying goods or services to government and useful to companies that in turn supply to them

6 Smith (2016; p32)

- capacity-building and job-enrichment for company employees assigned to act as coaches or mentors to visiting lecturers, which is an important contributor to staff morale and thereby to productivity and retention

Much work remains to be done to improve the quality and alignment with industry of the teaching in TVET colleges in South Africa. What has been accomplished so far through short-term placements of lecturers and other engagements with industry demonstrates that this is a strategy that deserves widespread adoption.

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Models of University-based Further Education Programmes (FEPs) for Vocational Education and Training (VET) Practitioners and the Economic Development of Sub-Sahara Africa

Benjamin A. Ogwo

Abstract

Globally, universities adopt locally/regionally-suited models in fulfilling their workforce development roles. However, the Sub-Saharan African (SSA) universities have not kept pace with developing a competent workforce for the informal, non-formal, and formal sectors of the economy by providing functional, and country-specific Further Education programmes (FEPs). For example, the informal sector continues to play significant economic roles in SSA countries without commensurate assistance towards developing its workforce; hence, it is incumbent on the universities to develop FEPs for upskilling the sector's workforce. Evidence abound of the SSA governments' neglect of the informal/non-formal workforce development enterprises due largely to their nebulous nature, and the high illiteracy rate among the practitioners. Fortunately, there are university-based workforce development models that could adapt learning objects, digital software applications, apprenticeship programmes, massive open online courses (MOOC), internships, and dual systems in developing FEPs for Vocational Education and Training (VET) practitioners. Thus, this paper explores four university-based FEPs models and the prospect of using them in upskilling VET practitioners in Sub-Saharan Africa. It discusses these different FEPs and the universities' roles in providing a competent workforce for economic development of SSA. The viable FEP models should be inclusive, provide employability skills/transferable credentials, recognize prior knowledge and lead to the sustainable economic development of the region. Their

successful implementation is pivoted on the mutual respect between the universities and VET practitioners since each party has valuable occupational content and community-derived socio-economic constructs required for the FEPs to precipitate the economic development of the SSA countries.

Background and Context

There is a direct relationship between the technological and human capital development levels of any nation. This relationship is made more apparent by the quality of the workforce versus the type of technology/industry prevalent in the economy. In the workforce composition of any nation, the professionals/highly skilled are at the apex, at the middle is intermediate-level skilled (such as Vocational Education and Training [VET] practitioners) while at the base are untrained/low skilled workers. In most of the developed countries, the VET professionals outnumber the low skilled workers within the working population while in Sub-Saharan African (SSA) countries the workforce is disproportionately populated by unskilled/low skilled workers, mainly the youths (Adams, Johansson de Silva, and Razmara, 2013).

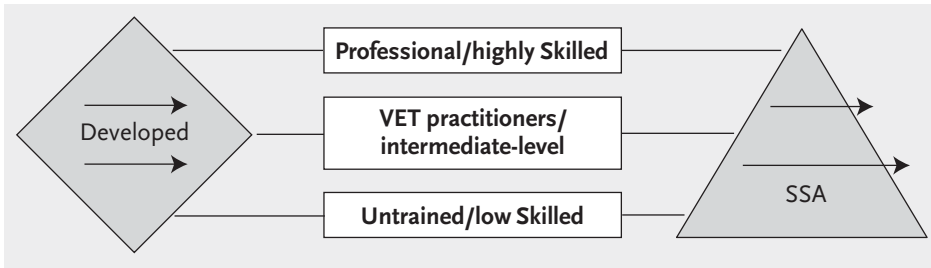

Fig. 1 Workforce Composition in Developed and SSA countries

The SSA countries have continued to experience a mismatch between its workforce needs and types of skills available to match the increasing complexity of their economy. Many of the semi-skilled/low skilled workers in SSA are found in the informal sector which accommodates a large segment of the economy. Hence, any workforce development model that discountenances this reality is unlikely to succeed. Apparently, integrating economic development initiatives with VET practitioners' upskilling programmes in both the formal and informal economic sectors of SSA will facilitate the achievement of the region's sustainable development goals (SDGs). Such inclusive approach towards implementing the SDGs will effectively contribute towards ameliorating poverty, and ensuring that all citizens participate in the region's economic growth. Indeed, attaining the objectives of the workforce development components of the SDGs in SSA are fraught with structural and perceptual challenges namely:

- The informal sector of the economy that bears the bulk of the workforce and economic development in SSA has been seriously neglected over the years; resulting in untold consequences for the VET practitioners and the economy (International Labour Office [ILO], 2012).

- The ivory tower stance of the universities alienates them from the community and has hampered the extension/cooperative/community services required of them.
- Insufficient policy direction on Further Education for VET practitioners in informal and non-formal VET sectors for institutions desiring to facilitate such programmes.
- The non-formal/in-plant training VET system is not properly articulated in many Sub-Saharan African countries.

These structural and perceptual challenges can be tackled by implementing the four proposed FEP models within the university setting. If the objectives of the FEPs are attained, the outcomes will lead to divide bridging between the ivory tower and the informal and non-formal sectors thus providing the needed attention to the sectors as well as providing empirical data to formulate policies that would address workforce development issues in informal VET sub-sector.

However, for the SDGs to be attained, its initiatives for SSA countries has to specifically include university-based workforce development programmes on Further Education programmes (FEPs) that include the informal and formal economic sectors. It is antithetical for the international development agencies and governments of SSA countries to increasingly pursue policies that tend to provide more low-skilled jobs rather than upgrading the skills of the workforce in both sectors of the economy. The SSA countries can never be globally competitive if their workforce is predominantly low-skilled workers in low tech occupations. The workforce development agencies and employers' associations, trade unions should work with the industry to identify their needs and assist in conveying those needs to the universities for developing effective FEPs that will ensure a better-prepared workforce. There are university-based models (Apprenticeship, dual system, modularized and the Viaduct model) of FEPs which can be adopted in up-skilling the VET practitioners in the formal and informal sectors as well as ensuring the economic development (increased productivity, investment [return on investment of trainees and increased foreign investment], increased GDP, poverty reduction and pursuit of happiness) of Sub-Saharan Africa. Thus, this paper explores four university-based FEP models and the prospect of using them in upskilling VET practitioners in Sub-Saharan Africa. It discusses the different FEP models and roles of the universities in providing a competent workforce for economic development of SSA.

Models of University-based FEPs for Sub-Sahara Africa

Further Education or continuing/professional education (term used in the United States of America) programmes are post-secondary and non-degree courses offered by the university for workforce development and cooperative/community service. In most United States' public universities, FEPs are usually provided by the research/academic departments/units as community engagement activity linking university research outcome/available faculty expertise with real-world prac-

titioners from different industries (The American Academy of Arts & Sciences, 2015). However, in SSA countries, most of the FEPs are limited to post-secondary and the educated people; at the neglect of some VET practitioners who may be illiterate. Universities in SSA are challenged to evolve FEPs that are inclusive of the formal and informal sector workforce. FEPs will provide the needed intervention on improving the knowledge base and upgrade the quality of technical skills proficiency available to the informal sector. There are numerous areas of VET in which the FEPs could be developed but each country should determine the trades/occupations of urgent need such as the automobile, agriculture, technical services (electronic and mechanical technology maintenance), construction, food services, computer technology etc. In order to align the FEPs with the SDGs, the following are the general objectives for the SSA models:

1. Making the employees and local companies nationally/internationally more competitive.
2. Providing a seamless link between the skills/experiences acquired in both the formal and informal sectors of the economy.
3. Encouraging more direct investment and making Africa the next outsourcing destination by upskilling the workforce.
4. Improving the quality of life of the citizens irrespective of their level of education by improving on their skills irrespective of how they were acquired – formally/informally.
5. Increasing the returns of investment of the trainees – demand-driven programmes; thereby reducing the unemployment/underemployment rate by providing competency-based programmes.
6. Employing the expertise, organization and structure of the universities to solve workforce challenges of the countries.

In order to attain these FEPs objectives, the four proposed models are Formal Apprenticeship, Dual System, Modularized, and Viaduct. Table 1 outlines the major characteristics of these models. The curriculum contents of these models need to be competency-based, flexible, demand-driven and industry-specific. Of particular importance is the viaduct module in which VET practitioners are offered bridge/preparatory contents on basic education (English, mathematics, e-literacy, enterprise management). The viaduct model is the bridge between the informal sector VET practitioners and the formal education system. Its graduates should be able to transfer obtained credentials to other formal education programmes and the FEPs. All credentials obtained from the FEPs must be transferable and constitute foundational courses for degree programmes. The four FEP models are complementary to one another and student centred as well as need driven. The VET institution and the student should work together in choosing the most suited FEP for each student based on interest, background (prior learning) and skill set. For example, the modularized model could be taken by anybody even those already enrolled in the formal apprenticeship or the dual system, especially if the knowledge and skill set in a particular module will provide immediate return on invest-

ment (enhancing the student's economic circumstance) and at the same time complement the student's progress in any other model. The SSA universities should step up towards assessing and recognizing prior learning, researching on VET/FEPs, writing policy briefs, developing instructional materials (use of apps (translating to indigenous language) and digital technology) and adopting contextualized learning/instructional strategies. The effectiveness of these FEPs is proportional to the extent of contextualization of their implementation processes specifically, integrating the curriculum content with industry standards, locating each FEP within career pathways of the student, specifying the entrepreneurial application of skills taught.

Tab. 1 Types and Major Characteristics of the Further Education Programmes

Sn	Major Characteristics of the Model	Models of FEP			
		Formal Apprenticeship	**Dual System**	**Modularized**	**Viaduct**
1.	**Objectives/roles of the university**	Develop content/ oversee recognized apprenticeships for specific trades to be implemented by approved industries/ dept. of labour or trade associations/ unions	Combine skills training in a company and theoretical content delivery at the university.	Develop standardized contents/modules on industry-validated skills set in different occupational areas	Develop general education programmes on basic communication, science, and numeracy linked with the trades.
2.	**Target Population/Qualification**	Post-secondary/ primary and out-of-school youths	Post-secondary/ primary and out-of-school youths	No educational/sector restriction, underemployed people	Informal sector illiterates
3.	**Industry and occupational Area**	Technical service trades, hospitality, and tourism	Technical occupations	All occupations	Non-restrictive
4.	**Mode of Delivery**	Use of MOOC, work-based learning (Cedefop, 2015)	Work-based learning, MOOC, face-to-face	MOOC, eclectic, face-to-face, hands-on	Face-to-face,
5.	**Structural Linkage with university**	Domiciled in a company	Domiciled in the university	Domiciled in the university	Domiciled in the university
6.	**Duration**	Minimum of two years	Minimum of two years	Minimum of four weeks	Minimum of one year
7.	**Certification**	Trade license	University diploma	Certificate per module/non-certification	Certificate

Implementation Issues for the University-based FEPs

In all of the SSA countries, there is a preponderance of FEPs and capacity building/non-formal/in-plant programmes designed and supported by governments and international development partners (UNDP (United Nations Development Programme), UNESCO (The United Nations Educational, Scientific and Cultural Organization), AfDB (African Development Bank), World Bank, GTZ (Gesellschaft für Technische Zusammenarbeit), DFID (The Department for International Development), USAID (The United States Agency for International Development) etc.). Furthermore, the proposed university-based models of the FEPs are similar to those already run by cooperative units of most universities. However, the striking

difference between the cooperative units' FEPs and the proposed FEPs is that they should be implemented within a full-fledged VET academic department, its design/implementation decisions are based on qualitative/quantitative data obtained from needs assessment, properly accredited by an external agency and providing for VET practitioners' input at the various levels of implementation and governance. It is extremely important to involve the target populations in every design and implementation process of the FEPs to ensure ownership and commitment towards the attainment of the objectives. For example, the leadership of the informal sector trade unions has been working with national/international development agencies on short-term intervention programmes; hence such organized practices will be the leverage for the university-based FEPs to latch on. All the major stakeholders (captains of industry, trade union/association, employers and university administrators and students) should have specified roles in all the governance, decision-making structure and committees. In addition, the policy on implementing the university-based FEPs should incorporate some incentives for VET institutions that reached out to the informal sector. These VET institutions could offer scholarships for the informal sector VET practitioners that enrol in the FEPs and government/international development partners will bankroll the funding of the FEPs. This will be a win-win situation for the institutions, the informal sector, and the national economy.

The FEPs should be service-driven hence the university should not regard them as soft targets for internally generated revenue. When an effective governance structure is agreed upon by all stakeholders, the FEPs would attain remarkable credibility that can easily translate to funds from government agencies, companies, employers and international development agencies. Especially for the Viaduct model and modularized FEPs, there should be scholarships for the students while the dual system and formal apprenticeships could pay stipends to the trainees. In terms of instructional delivery, there are already developed learning objects and lots of massive open online courses (MOOCs) that are free and adaptable to the contents of the FEPs. Table 2 shows the list of some web-based resources and MOOCs that could be used for content delivery. In order to reduce the implementation cost, there should be a generous utilization of digital materials, interuniversity cooperation and articulation agreements within/outside each SSA country. Of equal importance is the need for interregional and regional academic and development collaborations (AU [African Union], ECOWAS [Economic Community of West African States], SADC [Southern African Development Community], BRICS [Brazil, Russia, India, China and South Africa]) – providing critical mass of students versus resources, focus on south-south cooperation in respect of human/material exchanges (United Nations, 2010), establishment of a regional material and content development centres. Other national/regional level implementation measures include:

- Prioritizing for occupations of utmost need – demand-driven
- Harmonizing international certifications and involvement of examination bodies

- Provision of assistance from international companies and donor agencies
- Development of digitalized content/media

Tab. 2 List of Web-based Resources and Massive Open Online Courses (MOOC) and their Websites

Sn	Title of the Resources and MOOC	Description	Website
1.	**Course Buffet**	Hundreds of free online MOOCs courses from over 250 Universities e.g. computer & technology, engineering, Health & nutrition, education etc.	https://www.coursebuffet.com/
2.	**The VOCEDplus Pod Network**	Allows instant access to research outcomes and other resources on vocational courses.	http://www.voced.edu.au/pod-network
3.	**OpenEducationEuropa (The gateway to European innovative learning)**	The Open Education Europa MOOCs Scoreboard includes more than 1,500 open courses throughout the European Union.	http://www.openeducationeuropa.eu/
4.	**Canvas Network**	Online courses (business, education, interdisciplinary etc.) from colleges, universities and organizations worldwide.	https://www.canvas.net/
5.	**Websites, Apps and more**	Apps, the internet sites, and resources for education, training, and professional development.	https://www.okcareertech.org/educators/cimc/resources/downloads-1/
6.	**edX**	And open-source platform of 90 global partners comprising Massachusetts Institute of Technology (MIT), Harvard University etc. that offer 910^{+} courses on computer science, engineering, mathematics, communication, education etc.	https://www.edx.org/
7.	**Commonwealth of Learning**	An inter-governmental organization that develops resources and programme (VET, teacher education, lifelong learning for farmers etc.) for the 54 member states of the commonwealth of nations.	http://www.col.org/what-we-do
8.	**Khan Academy**	Offer free courses in mathematics, science, computing, arts and humanities, entrepreneurship etc.	https://www.khanacademy.org/
9.	**MITOPENCOURSEWARE (Massachusetts Institute of Technology)**	Web-based of MIT course content in engineering, science, mathematics, education etc.	http://ocw.mit.edu/courses/
10.	**Coursera**	Offering 1867 courses designed across 28 countries on physical science, engineering, computer science etc.	https://www.coursera.org/browse?languages=en
11.	**Knowledge Lover**	Names/website addresses of 70 + Best MOOC (Massive Open Online Course) Providers List.	http://knowledgelover.com/best-mooc-massive-open-online-course-providers-list/3/
12.	**WSIS Knowledge Communities**	Global List of Open Educational Resources (OER)	http://www.wsis-community.org/pg/directory/view/672996

The Economic Development of Sub-Saharan Africa and the FEPs

The FEPs would accelerate economic development resulting in skilled/globally competitive workforce, increased GDP, poverty reduction, a decrease in youth unemployment and creating outsourcing destinations in SSA countries. The informal sector which has not fizzled out even with the lavished attention on the formal sector (Ogwo, 2013) should be restructured/upskilled to contribute more to the

economy. It would be foolhardy to expect scholars from other regions to fulfil this responsibility. The ivory tower stance of SSA universities should be jettisoned in order to enable the faculty to associate with their community's economic aspirations. The FEPs remain the veritable models for developing competency-based content and demand-driven programmes for supplying the skilled workforce required to attain the SDGs. Universities within the Asian tiger economies provide examples for African universities in transforming their workforce and becoming more globally competitive. There is every need for home-grown FEPs rather than foreign models. It is pathetic to note that most countries in SSA attained political independence over five decades ago but have not shown committed efforts towards economic independence. In this regards, the FEPs, even as a stop gap would provide the much needed functional and experiential education that targets economic development and independence.

Conclusion

There are no silver bullets in the FEPs models rather they provide the guidelines towards tackling the workforce development challenges facing the SSA and do provide the exemplary models for demand-driven, competency-based, and accountable education in SSA. It will require the commitment of all major stakeholders and political will of SSA governments to implement and upskill the informal/non-formal sector workforce. The SSA economies would not achieve sustainable advancement if it continues to neglect the informal/non-formal sector or to continually graduate unemployable Higher Education students. If the governance structure of the FEPs is deemed effective by all the major stakeholder, the universities deemed to be committed to achieving the objectives, funding would not be of import because the national, regional governments and international development agencies would certainly adopt them in tackling youth unemployment and pursuing most of the sustainable development goals in SSA.

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Applied Learning design in an online VET teacher-education course: A pedagogical framework that responds to the needs of mature-aged, employed students

Jillian Downing

Abstract

As one of the major contributors to the education sector in Australia, Vocational Education and Training (VET) operates within a number of contexts, including schools, private training providers and Technical and Further Education (TAFE) colleges. It takes responsibility for the continuing education of nearly two million students (from high school age to mature age) each year. Within VET there are approximately eighty thousand teachers employed, mostly on a part-time basis, delivering a wide range of courses (e.g., construction, hospitality, aged care, business, retail, tourism, arts, child-care) and catering for both employed students (e.g., apprentices) and pre-employment students. Unlike many other countries, teachers employed within the VET sector in Australia are not required to hold a degree in teaching, although a growing number are interested in pursuing a university degree in order to progress their career and professionalism.

This paper considers four aspects of VET teacher-education in Australia. Firstly, it provides an overview of the qualifications and experience required by providers of VET and identifies the opportunities universities have to offer additional professional development. As VET teachers are likely to be mature-aged, juggling work with study and been away from formal study for some time, there is a need for providers to consider how best to respond to these students. Secondly, this paper describes the approach taken by the University of Tasmania in a relatively new VET teacher-education programme, a *Bachelor of Education (Applied Learning)*. The specialty focus of the course, 'applied learning', represents the desired pedagogical approach in VET settings — bringing application and theory together in an inte-

grated fashion in order to facilitate effective learning. An innovative approach was adopted to the design and development of units within the course, in order to create a learning environment that 'walked the talk' of applied learning whilst still reflecting the academic rigor expected in a university degree course. A set of six theoretically underpinned 'applied learning' design principles were articulated, which guided teaching staff as the course was developed, incorporating aspects such as student collaboration, integrating learning tasks with workplace roles, and ensuring that assessment tasks were authentic and applied.

The third part of this paper considers a recently completed doctoral study on the effectiveness of the design principles guiding the course. The findings led to a greater understanding of the nature, characteristics and needs of the students, including a vulnerability for self-doubt and withdrawal but also a desire to contribute altruistically and positively to the learning community. The investigation concluded that an applied learning approach that respects and integrates the students' lived experience can lead to positive, even transformational outcomes for students. The study also identified ways for course designers to capitalise on the affordances of web-based technology to support geographically and characteristically diverse students.

Finally, this paper considers the future of VET teacher-education in Australia and more broadly, considering the growing demand for high quality VET education and the subsequent role for universities. Most importantly, the paper contends that providers must consider how best to ensure a relevant, engaging and rewarding Higher Education experience for a diverse and dedicated VET workforce, who are developing the next generation of workers in a wide-range of industries and professions.

Keywords

Applied Learning, authentic learning, VET teacher-education, Higher Education pedagogy, online learning, design principles.

Introduction and background

The Vocational Education and Training (VET) sector fulfils a critically important role in Australia in preparing adolescent and mature-aged students for their chosen vocation or career. Teachers employed within the VET sector in Australia are likely to have had a successful career within their specialist area before moving into a teaching role. For example, they have been carpenters, electricians, chefs, hairdressers or mechanics and, typically, become teachers through a desire to give back to their industry (Productivity Commission, 2011). As VET teachers, their job role extends beyond teaching to working closely with employers and industry partners to support the apprentices and employees in their chosen careers.

Since the 1990s, Australia has adopted a national approach to VET, with a suite of training packages that are delivered by teachers in Registered Training Organis-

ations (RTOs). A training package is a set of nationally endorsed standards and qualifications for a specific industry, (e.g., construction or hospitality). Each training package is developed by the related national Industry Skills Councils (ISCs) and should represent the desired skills and knowledge required by employees in that sector. Qualifications within each training package usually start with a foundational Certificate I and progress to a more advanced level, such as a Diploma. Every RTO that delivers training packages must conform with national requirements relating to the quality of delivery and assessment of the qualifications, or risk losing the right to offer their chosen training package.

Unlike many other countries, teachers employed in the VET sector in Australia are not required to hold a degree in teaching. Rather, the minimum requirement to teach or assess students enrolled in any of the VET qualifications is a Certificate IV in Training and Assessment (Cert IV TAE), which is a relatively short course to complete. Additionally, all VET teachers should have relevant industry experience and hold the vocational qualifications (such as Diplomas) in their subject area, at one level above the level that they are teaching. While some VET teachers may have university degrees in their discipline area (e.g., engineering or business), about 60 % of VET teachers do not (Productivity Commission, 2011). Hence, the typical educational profile of a VET teacher is quite different to a teacher in the school sector, who has completed a four year degree in teaching, or a degree in their discipline area (e.g., science) followed by a post-graduate degree in teaching.

While holding a university degree in teaching is not mandatory, many VET teachers are interested in pursuing a higher-education qualification in order to improve their knowledge and skills and advance their career. The VET teachers who decide to undertake university teacher-education courses are, however, likely to be quite different to the traditional university student. Many VET teachers, particularly those from trades with a traditional apprenticeship pathway, such as construction, hairdressing, and the retail sector, left school at a relatively early age and not consider themselves to be 'academic'. Many will be first-in-family to attend university and, as mature-aged entrants, have been away from formal study for a considerable time. They are also likely to be adding university study to other roles such as employee or parent. With these characteristics, VET teachers undertaking university study are very likely to fit the description of 'non-traditional' students (Munro, 2011) and as such, are representative of a growing segment of the university student cohort (Allen & Seaman, 2014). For these students, engaging in Higher Education is a daunting prospect and a supportive, constructive and positive learning and teaching environment is needed in order to attract and retain enrolment (Gilardi & Guglielmetti, 2011). Yet despite increasing numbers of non-traditional students, there is little evidence that universities are actively responding to their needs (Meuleman, Garrett, Wrench & King, 2014). This may be a contributing factor to the current situation in Australia where there is a struggle to maintain healthy student numbers in VET teacher-education programmes, and a consequential reduction in the number of courses on offer.

Applied Learning in VET teacher education

In 2012, the University of Tasmania began a new VET teacher-education course, a *Bachelor of Education (Applied Learning)*. Historically, applied learning is most commonly referred to as 'learning with your hands' and pedagogically is most closely aligned with experiential learning (Dewey, 1938; Kolb, 1984). It melds together the two kinds of knowledge that philosopher Gilbert Ryle (1949) suggested: *knowing that* and *knowing how.* Ryle (1949) proposed that integrating theoretical knowledge (*knowing that*) with practice (*knowing how*) enables a student to move beyond being trained and into a space where the skills of lifelong learning are internalised. Thus, an applied learning approach has the potential to bring together theory and practice in a manner that builds the type of attributes sought in university graduates. Although usually associated with the VET sector, the Higher Education literature reveals a limited but growing interest in applied learning through "the kind of pedagogical principles and practices associated with engaged scholarship, communities of practice, civil engagement, and critical pedagogy" (Schwartzman & Bouas Henry, 2009, p. 5). Ash and Clayton (2009) suggest that an applied learning approach in Higher Education is:

> *... grounded in the conviction that learning is maximized when it is active, engaged and collaborative. Each applied learning pedagogy provides students with opportunities to connect theory with practice, to learn in unfamiliar contexts, to interact with others unlike themselves and to practice using knowledge and skills (p. 25).*

Applied learning pedagogy focuses, therefore, on connecting theory with practice through context-based activity, and as such is broadly aligned with authentic learning (Herrington, Reeves & Oliver, 2010), situated and experiential learning (Brown, Collins & Duguid, 1989; Dewey, 1938; Kolb, 1984), the characteristics of adult education (Knowles et al., 2011; Mezirow, 1991) and communities of practice (Lave & Wenger, 1991).

Drawing upon this literature and more broadly, a set of applied learning design principles was created to guide the development and delivery of the four year, fully online, undergraduate degree at the University of Tasmania. Table 1, below, describes each design principle guiding the course, along with its theoretical underpinning and enactment into the course.

Tab. 1 The Applied Learning Design Principles, their theoretical underpinnings and enactment into the course.

Applied Learning Design Principles		
Design principle	***Theoretical underpinning***	***Students will be:***
1. Provide learning activities that connect theory and application in authentic contexts.	Experiential Learning Theory (Dewey, 1938) Authentic Learning (Herrington, Reeves, & Oliver, 2010) Situated learning (Brown, Collins, & Duguid, 1989) Realistic Teacher Education (Korthagen, 2001) Applied teacher-education (Darling-Hammond, 2006)	• Involved in activities that integrate theoretical concepts with practical application; • Encouraged to make connections between what they are studying and the real workplace issues and challenges; • Engaging with authentic problems and integrating those with their studies; and, • Working closely with practitioners to better understand the skills and knowledge required in the workplace.
2. Recognise the lived experience of students.	Adult learning theory (Lindeman, 1926; Knowles, et al., 2011) Transformational learning (Mezirow, 2000) Workplace learning (Billett, 2004) Reflective practice (Brookfield, 1995; Schön, 1983)	• Recognised as having relevant and valuable life experiences; • Encouraged to critically reflect on those experiences in the learning process; • Invited to consider alternative approaches and perspectives; and, • Engaged in deepening their understanding through new experiences in a range of settings.
3. Provide meaningful opportunities for the collaborative construction of knowledge within the learning community	Authentic Learning (Herrington et al., 2010) Communities of Practice (Lave & Wenger, 1991) Learning communities (Salmon, 2011; Shulman, 2004) Community of Inquiry framework (Garrison, Anderson & Archer, 2001)	• Encouraged to take on roles that enable them to contribute meaningfully to the online community; • Invited to contribute altruistically to the learning environment for the benefit of their peers; and • Supported as they undertake collaborative activities, in recognition of the challenges that lie within it, particularly in the online environment.
4. Encourage the development of a professional identity through collegial interactions in a range of settings.	Identity and practice (Wenger, 1999) Reflective practice (Brookfield, 1995; Schön, 1983) Communities of Practice (Lave & Wenger, 1991) Dialogue of Inquiry (Kozminsky, 2011; Loughran, 2006)	• Encouraged to be actively involved as a member of their professional community; • Building evidence of their attainment of the professional standards of teacher-education graduates; • Engaged in robust discussions and interactions with their peers and teaching staff on a wide range of topics relevant to their profession; and, • Actively building their professional identity.
5. Provide authentic assessment tasks that reflect the way the knowledge will be used in real work settings.	Authentic assessment (Herrington & Herrington, 2006) Sustainable assessment (Boud, 2006) Formative feedback (Black & Wiliam, 1998; Hattie, 1999) Authentic assessment in teacher-education (Darling-Hammond, 2000; Shulman, 2004)	• Completing assessment tasks that require the skills and knowledge associated with their future roles in the workplace; • Creating practical products that will be meaningful and useful to learners in their profession; • Participating in peer-review and formative feedback processes; and, • Engaging in a number of activities in any one assessment task.
6. Encourage an increasing level of student ownership of learning.	Student autonomy in learning (Boud, 1988) Identity and ownership (Chickering & Reisser (1993) Ownership of Learning (Dudley-Marling & Seale, 1995) Adult learning theory (Knowles et al., 2011) Reflective practice (Brookfield, 1995) Authentic learning (Herrington et al., 2010)	• Encouraged to take increased responsibility for their approaches to learning and assessment; • Engaged in activities that draw upon their unique experiences and contexts; • Evidencing their achievements in an ePortfolio; and, • Collaborating with peers towards mutual achievement of learning goals.

In summary, the course design aims to ensure an engaging, meaningful experience for the students, responding appropriately to their likely characteristics and needs and role-modelling teaching approaches that they can, in turn, consider in their own classrooms. Students engage in their studies through a web-based Learning Management System (Desire2Learn), where they access a range of learning resources and activities and interact with their student peers and teachers through both synchronous and asynchronous modes of communication. Being fully online, students are able to adopt an 'anytime/anywhere' approach to their study, and teaching staff are purposefully 'present' in the online space – engaging with activities and responding to questions promptly and constructively. Enrolments in the course have grown significantly since its inception in 2012, defying the national VET teacher-education trend and enabling the course to become the most successful VET teacher-education course currently on offer in Australia.

Evaluation of the applied learning design principles guiding the course

A doctoral study (Downing, 2015) investigated the experiences of students in the Bachelor of Education (Applied Learning) over an eighteen month period, using the iterative process of design-based research to assess the influence and effectiveness of the applied learning design principles. Design-based research (DBR) is also known as *design research, educational design research, design experiments* and *development research*, and involves an iterative process of analysis, design, development and implementation of a specially designed intervention (Design-based Research Collective, 2003). Initally conceived and articulated by Collins (1992) and also Brown (1992), it is an approach that is particularly appropriate for educators who seek to incorporate research into practice and better understand the 'messiness' of real-world practice in a particular context. Data were collected through interviews, focus groups and student artefacts (such as assignments and online forum postings). Qualitative data analysis sought to identify themes inductively, which were then explored at a greater depth through a second layer of investigation.

The study investigated the extent to which the applied learning design principles fostered an environment where students could authentically apply what they were learning about to everyday problems and opportunities in real workplaces. Consistent with the design principles, students were expected to take a greater level of responsibility for their learning, and connect their studies to their own, unique, context in both the learning and assessment activities. This approach represents the heart of applied learning pedagogy/recognising and responding to the individuality of meaning-making and knowledge creation, and using that individuality to create more meaningful links between theory and practice. Over the three iterations of the study, the students showed a gradual and, in some cases, transformational change in the role they undertook in their own learning and in their confidence to grow professionally. Perhaps most indicative of the effectiveness of the

design principles was evidence that students were changing their own teaching practice in response to how they experienced their university learning environment.

The study revealed that applied learning design principles encouraged the students to reconceptualise their role in the learning environment. This often began with a need to (re)examine their beliefs about themselves as learners and the way in which they engaged with their teachers and peers. Rather than being passive receivers of content from an 'expert' teacher, they were introduced to new concepts, ideas, theories, frameworks and such like, and asked to examine and interrogate those in light of their existing perspectives and beliefs. Many participants with negative connotations from their school days were initially reluctant to show any behaviour that could be seen as challenging the authority of the teacher, but over time that tendency dissipated, and levels of self-confidence grew.

The findings from the doctoral study revealed that an applied learning approach that respects and integrates the students' experience and context can lead to positive, even transformational outcomes for students. Of critical importance was the need for immediate relevance of what was being studied to the every-day realities of the students' working lives – they wanted to 'put their learning to work' as soon as possible, both to maximise the value of their study and to help them to engage and maintain their commitment to study. Simply put, if studying in the course did not help them with their current and real challenges at work, withdrawal from enrolment was likely.

The conclusions of study contributed new knowledge about the characteristics and needs of non-traditional students and their behaviour in the learning environment. The investigation uncovered a persistent vulnerability for self-doubt and withdrawal, but this sat alongside a strong desire to contribute altruistically to the learning community. Indeed, it appears that the manner in which the design principles ensure opportunities to give meaningfully to the learning community may actually help non-traditional students to address concerns over their worthiness and capability to succeed in Higher Education.

Implications for pedagogical design in VET teacher education in universities

The study concluded that applied learning design can assist course developers in building an environment that more effectively links university study to the workplace and facilitates meaningful professional development. Additionally, the findings revealed that web-based technology can offer effective and engaging ways to support geographically and characteristically diverse students. Importantly too, given the growing number of non-traditional students entering university, the applied learning approach responds well to those students with a low sense of self-efficacy, who need encouragement and support while developing the confidence to engage fully in the university environment.

The study also found that teaching staff in universities should be open to reconceptualising their role in the learning environment; moving from being seen as the 'expert' to more of a facilitator, by helping students connect what they are learning with their real workplace context. This requires teaching staff to be more open to allowing a degree of modification to learning and assessment tasks in order for those tasks to be more meaningful and rewarding (both intellectually and pragmatically), and truly respecting what the students brought to the learning environment.

Summary

This paper has provided an overview of the context in Australia for VET teachers, and their continuing professional development and education. Importantly, it appears that a growing number of VET teachers are interested in pursuing a Higher Education experience, but they will need a supportive, constructive and meaningful course in order to feel confident, engaged and motivated.

The applied learning design principles that guided the course development and delivery, and the findings of the accompanying doctoral study, may well be a useful resource for other Higher Education providers seeking to build an appropriate course for VET teachers. The applied learning approach appeals on a number of levels – it responds to the characteristics of non-traditional students, it models the desired approach in VET, and it is suitable for an online or web-based mode of delivery. It is noted that this doctoral study did not aim to be a comparative one in terms of what is offered overseas. Therefore, in terms of potential further research, a study on the effectiveness of the design principles in another context or discipline would be a valuable addition to the limited literature on this pedagogical approach – an approach that appears to offer much to the Higher Education sector.

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Paradigms for Networking Universities and Vocational Education and Training (VET) Institutions on Competency-Based Further Education in Sub-Saharan Africa

Benadeth N. Ezekoye

Abstract

Universities and Vocational Education and Training (VET) Institutions, as well as their faculties, pride in being independent and autonomous; which tends to promote reclusiveness and sometimes isolation. More so, the attitude of preserving institutional independence is very prevalent in VET institutions in Sub-Saharan Africa because of their sense of protecting trade secrets and remaining competitive. Furthermore, these institutions always look up to the developed countries for collaboration without fair thoughts on how they can share institutional experiences among themselves given the dissimilarities of their national development trajectory. Paradoxically, the open source community has proven that the technology community always fares better in conditions of organized collaboration, networking, and collective mindset. Thus, this paper presents to VET leaders and policymakers some paradigms for networking Universities and VET institutions on competency-based Further Education in Sub-Saharan Africa. It also explores the key themes on the challenges, policy issues and priorities for further research on networking the institutions. It is vital for Sub-Saharan Africa VET institutions to work together across the national and regional boundaries in solving the challenges of graduating incompetent workers that would never meet the employability threshold required by industries. The paper concludes that technology-assisted (cloud computing, intelligent tutors and software applications), structured networking (supported by regional bodies like African Union) among VET institutions in Sub-Saharan Africa

would not comprise competitiveness but will provide for collective growth, shared resources, institutional/professional mentoring; which will be cheaper to fund and will promote transferability of knowledge/skills given the commonality in socio-cultural heritage. Additionally, the Organization for Economic Co-operation and Development (OECD) and European Union (EU) country-level models of institutional Networking are possibilities among many for encouraging collaboration of VET institutions and Universities within the Sub-Saharan Africa.

Introduction

Networking universities and Vocational Education and Training (VET) institutions nationally and across Sub-Saharan African (SSA) countries creates the critical mass of material and human resources for galvanizing the region's human capital development. However, the isolation policies pursued by these institutions have robbed them the opportunities for collaboration and the benefits of the multiplier effects of shared resources. Prevalent is the zeal among administrators and faculty to collaborate only with institutions from the developed countries at the neglect of those with the African. The wide gap learning curves between the institutions in terms of attitude, worldview and skills set mitigates the quality of such networking. Thus, the SSA VET institutions and universities appear to be ignorant of how to share material resource, institutional experiences and technical expertise among themselves. Therefore, a networking framework that provides mechanisms for sharing experiences, transferring technology, exchanging VET information and coordinating development among Universities and VET institutions in Sub-Saharan Africa is highly needed.

A network provides ready access to a pool of energy, information and knowledge and linkage to other networks; that are of value to both individuals and institutions (Cohen and Prusak, 2001), For example, institutional networks of VET institutions and universities can be defined from the perspective of the programmes offered, national and regional levels (Séror, 1998). Other networking mixes relevant to those of VET institutions in SSA include those of unions, governments, agencies for international development, innovation centers, business incubators, professional support associations. Thus in this paper paradigms are regarded as the lens by which these networks are shaped, perceived, and structured among national as well as regional universities and VET institutions; with regards to providing competency-based Further Education in Vocational Education programmes.

In Sub-Saharan African countries, VET is delivered through three major systems: formal (private and public school systems), non-formal (community groups, training institutions, and other organizations) and informal (apprenticeship) (Ogwo and Oranu, 2006). The implementation of a dual system of Vocational Education and Training is not widespread in SSA (unlike in German where the dual system of Vocational Education has been rated positively by many researchers). Some SSA countries have started implementing the dual system while others are yet to start.

Generally, the VET systems are mainly challenged by the faculty's inadequate pedagogical skills with regards to application of technologies and current industrial/commercial practices. They are also confronting inadequate professional development opportunities and inadequate instructional materials. These challenges have impeded the implementation of competency-based programmes and as such resulted in graduating unskilled students. Therefore, it follows that competency-based Further Education programmes be designed to upskill the unskilled VET institution/university graduates as well as provide continuing professional development of the VET teachers. In some SSA countries, continuing professional development of teachers and trainers of VET programmes has been identified as a priority and a tool for reforming Vocational Education and Training systems. These countries are currently applying the concept of competency-based education and training by re-inventing or reforming their VET systems. There exists the national vocational qualification framework in some of the countries, although some of them are at the nascent stages.

Competency-based education and training is an outcome-based approach to curriculum development and implementation whereby the targeted skills derived from the industry are trained for and assessed. It has both a didactical dimension (competencies and qualifications) and a political and social dimension (pathways and opportunities for learning). Its structure includes: the course is recognized to meet national competencies standards; curriculum gives learners a clear indication of what is expected in terms of performance, conditions and standard; delivery is flexible and learners can exercise initiative in the learning process and assessment measures performance is demonstrated against a specified competence standard. Hence, the rationale for competency based Further Education and network in VET institutions includes more: cost effective, relevant, flexible, self-satisfying, self − pacing and based on specific occupational requirement.

In the above context, this paper presents to VET leaders and policymakers a framework for networking Universities and VET institutions on competency-based Further Education in Sub-Saharan Africa similar to the networking principles adopted by OECD, EU, commonwealth institutions etc. The framework is focused on networking VET institutions and Universities in SSA under the aegis of Economic Community of West African States (ECOWAS), African Union (AU), and the SADC (Southern African Development Community) etc. Industries participating in the students' internship programmes within the networked institutions should be part of the network since the employers are the ones complaining about the poor quality of the graduate. The paper explores the benefits that are derivable from implementing the framework as well as good policy issues associated with the framework.

Conceptual Framework

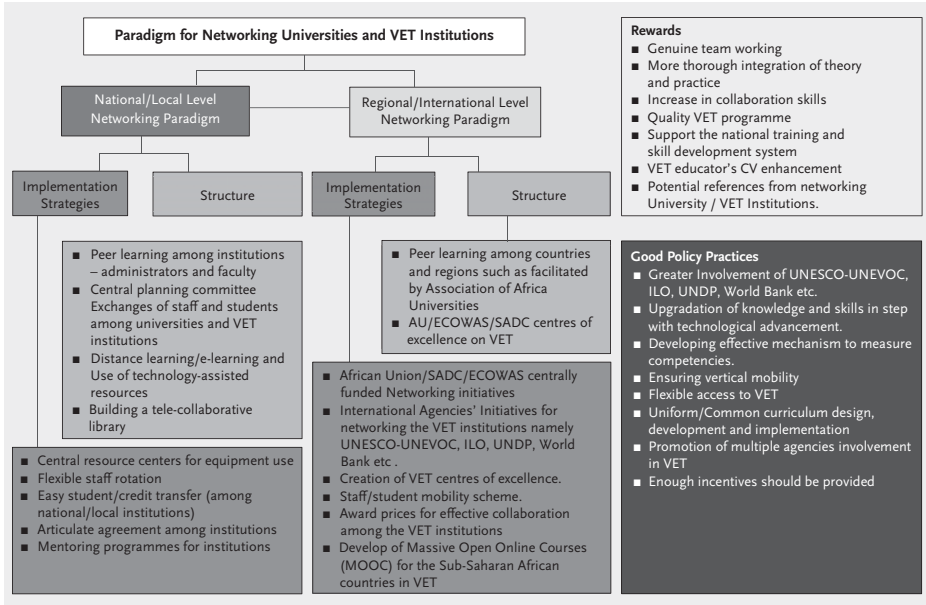

Fig. 1 A Conceptual Framework of the Paradigm for Networking Universities and VET Institutions in Sub-Saharan African Countries.

Framework for networking Universities and VET institutions on competency-based Further Education in Sub-Saharan Africa

The framework for networking universities and VET institutions on competency-based Further Education in Sub-Saharan African is outlined below. It is built around two elements: implementation strategies and structure at both the national and regional level.

National/Local level Networking Paradigm

Implementation Strategies

- *Central resource centers for equipment use*: This involves having central VET resource centers especially on competency-based Further Education, for learning resources and equipment use by the universities and VET institutions within 30 km of benefiting institutions. The centers' facilities should be provided as central resources for teaching/training purposes, as well as for internally generated revenue. Regulation applying in the use of the learning resources and equipment should aim at providing a pleasant learning and

working environment for the users of the center and helping them get the best of it.

- *Flexible staff rotation*: Developing a framework for the effective exchange of academic and administrative staff, such sabbatical leave, between/among universities and VET institutions to improve the exchange of best practices would be a valuable strategy for empowerment, retention and developing the VET workforce in Sub-Saharan Africa.
- *Easy student/credit transfer (among national/local institutions):*This involves establishing a central registry with common policies and procedures for students planning to take work at other universities and VET institutions within the same country or elsewhere. The registry should be responsible for the transfer of credit from other institutions.
- *Articulate agreement among institutions:* This involves developing a comprehensive articulation agreement (CAA) to optimize the networking benefits such as; smooth transfer of credits between/among universities and VET institutions, staff exchange, joint degree programmes etc. The focus should include: supporting current requirement in VET at all levels; establishing a process for maintaining currency; ensuring current information is generally accessible to students and teachers of VET programmes at all levels.
- *Mentoring programmes for institutions/faculty/staff (use of online platforms)*: This involves providing a discipline – specific mentoring programme model for competency-based continuing training and mentoring of VET teachers among the universities and VET institutions. The mentoring model should employ an on-line platform for continuing, two-way communication between departmental heads/chairs or programme coordinators, faculty members, course developers and adjunct staff.

Structure

Tab. 1 National/Local level structure, outlining typical features of each strategy.

Definition	Features
Peer Learning among Institutions (facilitated by national body for the universities)	
Individuals exchanging knowledge and experience with each other, and potentially diffusing this learning back to their organizations to ensure an impact – at scale – on reform initiatives.	Developing a competency-based Further Education common, clear and precise peer learning objectives, and peer engagements structured to maximize these objectives. Ensuring that the learning focus is relevant to all peers and their institutions. Individual peers should be appropriately matched, authorized and empowered to engage effectively. Learning gains of individual peers should be fed back to the institutions to ensure continued support for the learning process. The peer learning engagement process should be very simple with limited administrative demands and costs for the peers to find the process as easy as possible. The many facets of peer learning gains are to be evaluated, from initial engagement through individual learning to organizational/institutional learning and final reform impact. Building broad peer community of practice (CoP) approach is necessary to help strengthen professional associations and unions.

Definition	Features
Central Planning Committee	
The Agency responsible for central networking planning at national/local level on Universities/VET institutions competency based Further Education.	A national/local central planning committee for networking universities and VET institutions on competency-based Further Education will be established involving all the networking Universities/VET institutions at the national/local level. The purpose of the committee is to consider networking arrangement between/among the Universities and VET institutions including due diligence checks; to ensure a consistent approach to the academic and administrative support and management of the network and establish communication mechanisms across all parties and levels of the networking. The role of the committee will include discussion of a common approach to network management activities, assessment, and moderation, monitoring, and reviewing of networking arrangements, development, and application of the policy document, reviews of approval document and draft of the memorandum of cooperation. The committee may include the following people: heads and registrar of the University/VET institutions, the academic and administrative link persons, a member of quality assurance and enhancement (acting as the service officer), enterprises, social partners and other representatives of working life, including chambers of commerce and other trade organizations responsible for VET policy making and decision making.
Exchanges among Universities and VET institutions	
Sharing specific knowledge, best practices and innovative ideas.	Establish strategic collaboration and networking with enterprises, social partners, and local or national authorities to deliver high-quality competency – based further Vocational Education and Training in relation to their labour market needs. Establish project in support of exchange of best practices, innovative ideas and share of new knowledge among universities and VET institutions. As well as establishing international relationships with key stakeholders across sectors. Establish project on Tuition Exchange (TE) which entails a reciprocal scholarship opportunity for the dependents of eligible members of the networking universities and VET institutions.
Distance learning/e-learning and Use of technology-assisted resources	
A Programme of study whereby a learner would not normally be physically present in a University/VET institution site or that of a networking institution.	Effective use of web and learning software in sharing VET information and delivery of instructions on competency-based Further Education. Use of Moodle will give great opportunities in delivery competency – based further VET instructions and engaging learners on weekly tasks using Forum, Choice, Nano Gong, PowerPoint slides and Skype video calls which can offer both inter-instructional interactions and small-group discussions within a mixed group of learners from both institutions. Delivery could be shared between the University and the networking institution but a University should have responsibilities for the programme delivery, the provision of student support and the learning resources. Joint approval of the competency-based Further Education programme and module design; design and production of learning materials; content delivery and delivery support and assessment. There must be approval on the schedule of availability and readiness of any learning materials, support infrastructure, roles and responsibilities of academic and support staff and learners' access to the institutional system, support and guidance services.
Building a tele-collaborative library	
A digital library which involves an application of global computer networks for collections of VET books, periodicals, digital learning materials (instructional videos, learning objects, intelligent tutors, instructional games, recorded tapes) in institutionalized settings for use or borrowing by the public or the members of an institution/networking institutions.	Building a tele-collaborative library on competency-based further vocation education and training with a focus on collection of VET digital objects that can include text, visual materials, audio materials, instructional videos and games, stored as electronic media formats, along with the means of organizing, storing and retrieving the files and media contained in the library collection. The library can vary massively in size and scope and should be maintained by individuals, organizations affiliated with established physical library buildings or universities of VET institutions. The digital content should be locally stored or accessed remotely through computer networks. Also used in facilitating webinar.

Regional/International Level Paradigm

Implementation Strategies

- *AU/SADC/ECOWAS centrally funded networking institute:*This involves building continental and inter-regional cooperation and integration efforts of African Unions, South African Development Community, World Bank, Economic Community of West African States in funding the network. Such cooperation and support can positively contribute to capacity development, infrastructure, economic development and research and development on competency −based Further Education in VET across countries and regions. The European Training Foundation can be of immense help and the European Center for the Development of Vocational Education (cedefop) could be consulted to guide the initial set-up.
- *International Agencies' Initiatives for networking the VET institutions namely UNESCO-UNEVOC, ILO, UNDP, World Bank etc.* Some of the initiatives include; providing direct assistance to countries seeking to develop their VET systems through the provision of experts who work with a government official(s) in-country or through the development and implementation of country-specific programmes; fostering direct relationships between VET leadership across countries − at regional, international or thematic meetings. Promoting best practice in VET, through knowledge sharing and collaboration; engaging on extensive publications Programme (books, newsletters, research papers and e-documents) to enable the sharing of contemporary knowledge across the world.
- *Creation of VET centers of excellence*: This involves establishing regional/international VET Centers of Excellence specifically on competency − based further Vocational Education and Training to promote interdisciplinary activities designed to improve the quality of workforce and to promote necessary skills, knowledge and expertise needed for more sustainable societies and greener economies through offering flexible needs-driven Vocational Education and Training and competency-based education/training in line with international standards. The center should aim at occupations in sectors with particularly high growth potential, such as industrial mechanics, metalwork (with focus on machining and CNC), mechatronics and industrial electronics/electrical technology etc., offering practical further training course for teaching staff in their subject areas as well as the management staff on the best approaches to managing their institutions (quality management) and for 'green' Vocational Education and Training by facilitating regional and international networking, piloting new courses and conducting assessment and certification in line with international standards.
- *Staff/student mobility scheme:* This involves establishing international competency − based further Vocational Education and Training mobility scheme for VET students and staff such as Erasmus + (European Region Action Scheme for the Mobility of University Students) Programme, to provide teach-

ing/learning opportunities for the teaching staff of Universities and VET institutions and studying opportunities for their students. Training opportunities should be available for teaching and non-teaching staff employed in the various institutions. The sending institution and the receiving institution/enterprise must have agreed on the programme of the activities to be undertaken by the visiting staff member (Mobility Agreement) or student (Inter-Institutional Agreement) prior to the start of the mobility period.

- *Award prices for effective collaboration among the VET institutions and industries by regional bodies and international development agencies:*This involves awarding synergy prices to recognized examples of collaboration that could stand as a model of effective collaboration between/among the Universities and VET institutions in Vocational Education training and research development.
- *Develop of Massive Open Online Courses (MOOC) for the Sub-Saharan African Countries in VET:* A massive open online course (MOOC) is a model for delivering learning content online to any person who wants to take a course, with unlimited participation. Such model could be adopted for Sub-Saharan African countries on competency – based further Vocational Education and Training with emphasizes on open-access features such as open licensing of content, structure and learning goals, to promote the reuse and remixing of resources.

Structure

Tab. 2 Regional/International level structure, outlining the typical features of each strategy.

Definition	Features
Peer learning among countries and regions	
Individuals/institutions and industries exchanging knowledge and experience with each other, and potentially diffusing this learning back to their countries and regions to ensure an impact – at scale – on reform initiatives.	Developing an international competency- based further Vocational Education and Training common, clear and precise peer learning objectives, and peer engagements structured to maximize these objectives.
AU/ECOWAS/SADC centers of excellence on VET	
An entity that provides leadership, best practices, research, support and/or training on VET in Sub-Saharan African Countries.	Establish an international/regional center of excellence specifically on networking of Universities and VET institutions in innovations, best practices, capacity building, knowledge and information sharing system development and quality assurance on competency – based further Vocational Education and Training in Sub-Saharan Africa. A good example is the University of Nigeria Centre of Excellence in Technical and Vocational Education, Training and Research (CETVETAR) which was established through World Bank funding.

Rewards

The rewards for networking Universities and Vocational Education and Training (VET) Institutions on Competency Based Further Education in Sub-Saharan Africa are multi-dimensional. Some of these rewards are given in figure **2** below:

Fig. 2 Rewards for networking Universities and VET Institutions

Essential theme of the networking system

Tab. 3 Summary of the essential theme of the networking, along with the description and possible actions.

Although the conceptual framework for networking Universities and Vocational Education and Training (VET) Institutions on Competency-Based Further Education in Sub-Saharan Africa has been described above, the following themes should be recognized as critical to the successful networking of the various institutions and call for discussion.			
Sn	**Essential Theme**	**Action**	**Description**
1	Network structure	• Identify core members that will include the industries • Establish broad and clear goals and purposes (National and Regional) • Address the "hierarchy of needs" • Include a culture of trust in stated core values • Balance homogeneity and heterogeneity • Establish specific roles and functions • Establish bodies/committees and secretariat • Establish networking resource centers (national and regional)	• Ascertain the networking universities, VET institutions, and industries too; confirm the need for a network, identify expectations and focus where there is passion. • The focus is on the goals that have priority at the time, rather than on the entire range of objectives. • Design training to meet the practical needs of the VET educators/trainers and students/trainees. • Legitimize roles of sponsors and facilitators. • Establish resource centers at universities as well as in VET institutions. • Regulate minimum standards for the personal, professional and pedagogical qualifications of "official" training personnel.
2	Resources	Securing and maintaining adequate: • Joint Funding • Flexible Infrastructure • Technical expertise • Institutional capacity • Political will	• Identify sponsors and funding agencies • Training standards and learning resources should be designed to be flexible to accommodate differences in organizational/institutional size, individuals and training requirements • Flexibility in conducting training (e.g. duration)
3	Support	Maintaining supportive processes via • Chambers of commerce, ministry and industry • VET institutions and Universities • Agencies from international development • Technology • Internship provided by industries	• Greater involvement of UNESCO-UNEVOC, ILO, UNDP, World Bank in establishing and improving the networking system. • Identify and development of technological supports such as phone calls and teleconferences, electronic messaging systems (e-mail, chat rooms, lists, etc.), on-line forums, on-line directories etc. • Industries should provide job openings for students' internship and staff's externship programmes.

Sn	Essential Theme	Action	Description
4	Maturation	Mainly on focus and expansion • Work to reach a critical mass • Additional collaborative technology • Review the network structure	• Invite and actively engage new networking institutions • Implement additional collaborative technology as needed • Conduct short or mid – term evaluation and communicate the evaluation results to members/key interested and involved parties
5	Sustainability	Continue effective activities • Identify multiple opportunities for interactions • Recruit new members • Demonstrate tangible network outcomes • Redefine the network structure	• Create link with existing networks • Broaden network members and mentor the new members • Develop tangible and relevant services and resources, focusing on quality and not quantity • Revisit the network structure based on the evaluation results
6	Termination or Transition	Acknowledgment of diminishing effectiveness or transition to other issues or goals	Decide to end or transfer network

Challenges and possible remedies

Tab. 4 Challenges and Possible Remedies

Recognition of likely challenges that can mar the identified strategies and possible remedies are also proposed for further discussion.	
Challenges	**Remedies**
1. Inexperience in networking/unclear understanding of the networking strategy 2. Inadequate/limited resources (fund) for the development of learning resources. 3. Low level of technological advancement 4. Large number of participants (logistical issues) 5. Lack of commitment to the relationship, a mismatched relationship, or a misperception of the particular or multiple needs of the VET educators 6. Hesitation by VET educators to express needs for fear of professional repercussions. 7. Some institutions may misperceive VET educator's potential and set goals that are too high or low. 8. Some institutions may exclude themselves from networking as they are unaware of the limits and boundaries of such initiatives. 9. Dynamics of overdependence, "paternalistic regard," competition and desire for an institution to dominate may lead to unbalanced networking relationships/approaches. 10. Conservatism 11. Varying motivation 12. Assessment/Evaluation formats	1. Ensure adequate and clear statement of the networking strategy. 2. Ensure availability of resources, governments and development agencies. 3. Provide high-level technological skills and access to online facilities and infrastructure. 4. Ensure logistics are effectively and continuously addressed; appropriate media, learning center, time, means of travelling etc. 5. Ensure that VET educators are effectively matched as well as proper managing of the differences among them (personalities, cultures, gender etc.). 6. Build adequate trust and willingness among the VET educators in engaging fully in networking. 7. Ensure that institutional goals are moderate and of minimum standard. 8. Ensure adequate sensitization programmes on the networking initiatives among all the Universities and VET institutions in Sub-Saharan African Countries. 9. Ensure that VET educators involved in the networking reflect effectively on their learning gains and are willing to share learning back into their organizations. 10. Ensure that the universities and VET institutions involved are open to learning from the returning teacher/student and are willing to invest in learning from teacher/student. Be able to create time and spaces to bring learning home. 11. Develop joint/communal assessment tools or evaluation formats among the participating Universities and VET institutions.

Policy practices

Tab. 5 Good Policy Practices for effective implementation of the networking framework

The following good policy practices could be adopted for the effective implementation of the framework:

1. Involvement of UNESCO-UNEVOC in knowledge sharing experiences, databases and networking of universities/VET institutions.
2. Competency – based further Vocational Education and Training should provide for life-long learning and upgrading of knowledge and skills in step with technological advancement and competencies found in different occupations.
3. Developing an effective mechanism to measure competencies and recognize qualifications gained at the workplace and in foreign countries to facilitate access, learner-centered advancement and greater mobility of the VET educators.
4. Fully exploitation of the UNESCO-UNEVOC's potential to assist and facilitate the exchange of experiences, instructional materials, information on infrastructure development and use of databases to improve and reform Competency – based further Vocational Education and Training.
5. Ensuring vertical mobility to promote Competency – based further Vocational Education and Training and Development of standards for certification of competencies.
6. Flexible access to competency – based further Vocational Education and Training.
7. Involvement of university and VET institution in curriculum design, development, and delivery (Uniform/common).
8. Enlisting the cooperation of industry.
9. Enough incentives should be provided and enough room for maneuver are in place for universities and VET institutions to develop a close and committing network with each other or among themselves.

Conclusion

It is vital for Sub-Saharan Africa VET institutions and universities to work together across the national and regional boundaries in solving the challenges associated with graduating incompetent and unemployable workers. The paper therefore concludes that technology-assisted (cloud computing, intelligent tutors and software applications), structured networking (supported by regional bodies like African Union) competency – based Further Education among VET institutions in Sub-Saharan Africa would not comprise competitiveness but will provide for collective growth, shared resources, institutional/professional mentoring; which will be cheaper to fund and will promote transferability of knowledge/skills given the commonality in socio-cultural heritage. The networking Universities and VET institutions involved should be able to develop, at the institutional level, the necessary institutional guiding framework, and platforms for effecting networking among the institutions. The OECD and EU country-level networking models for institutions are adaptable for networking VET institutions and Universities in SSA which would also include industries hosting students that are on internship.

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Theory and method of reflection levels – its use in Vocational Education and Training

Martin D. Hartmann

Abstract

Vocational Education and Training (VET) has to refer to the needs of individuals in different ways. Specifically, it has to take into account precarious circumstances and a weak labour market in many countries. Therefore, it is necessary for under- or unemployed to create their own occupational opportunities. They have to be able to identify chances and to avail them in open and complex situations. To handle complex situations, suitable competences are required. Thus, VET must concentrate on neither subject discipline knowledge, nor skills development alone. To be effective in problem solving within complex situations, both should work together. Government and teachers have to develop appropriate curricula for this purpose.

VET-teachers have to know both the professional interactions, e.g. in farming, craft, industry and/or service (as domain experts) – and the associated teaching activities in school (as professional teachers). Teachers have to design active learning situations rich in opportunities for the development of competences. Teachers' university training has to address a minimum of three environments (both the above, as well as that of the university). Since managing complex situations, in particular for learning in school and university, is challenging, the author developed a theory and method of reflection levels to support educators acting in different learning environments. This theory structures activities in accordance with the abilities of the exponents. Based on this theory, it is easier to design learning situations relevant to the existing competence levels and in support of a further development of competences.

The theory and its implications are exposed.

Introduction

In order to work as a professional in Germany, one has to complete an apprenticeship of three or three and a half years. The apprenticeship is organized in a dual, or rather three-way-system of VET (enterprise, school and often third parties, like private educational institutions). In the majority of cases, enterprises need workers to perform their work responsibly and self-directed, since the tasks are complex and instructions cannot be given to every detail.

All over the world, labour has two functions: to provide a source of livelihood and – if it is a good work – to give life a sense of meaning and purpose. In many countries, there is a lack of work, thus many people are unemployed or underemployed. They have to develop ideas for their own escape from that labour market situation. In addition, they need competences to act in different segments of the labour market and/or at different levels. The need for competences and responsibility is not different from that in Germany.

The question is how appropriate competences can develop. Different systems of VET attempt to give different answers:

- One approach is to inform the learners about the subject content (often in a scientific context). This can take place verbally, using visualization or sometimes by conducting experiments. Learners then have to act based on that theoretical knowledge. Yet, often learners are not able to act adequately because they are not sufficiently informed about the circumstances required for the use of their knowledge and often they are unable to handle the necessary tools. In the context of a constructivist approach (e.g. Schmidt 1991, Reich 1998) this means, that content cannot connect to the mind. Enterprises such may train the learners, after the completion of theoretical learning, without linking to that theoretical learning content.
- The second approach is to learn within the working process (perhaps at an enterprise). The learners do what the trainer tells, demonstrates or otherwise instructs them to do or they imitate their behaviour. This kind of learning process is not systematic and mostly not science based. There are no exact explanations, the comprehension of actions is superficial and motivation can be poor, since the action takes place immediately and with several repetitions in order to take effect. There is no time to think and to reflect. Learners gain experience, but they are committed to the conditions. It is difficult to transfer the experience or knowledge to other situations. This is caused by a lack of mental restructuring.
- The third approach is to do the same at a workshop (maybe at school). Here, it is easier to learn, but the acting is generally not as consequential. Learning is often performed for its own purpose and is not contextualized. Therefore, learners lose their motivation, although they get sufficient instructions and explanations. Thus, there is no inspiration for mental restructuring and reflection on experiences.

If we want to avoid the difficulties stated above, effective learning shall not be organized as separate subjects with their own didactics. Learning must take place in full integration of theory and practise. Learning has to be organized problem oriented and complex. Therefore, teachers have to construct suitable, problem-based learning situations that give the learners the chance to connect themselves with the process, as well as the content. This can help to foster the development of competences of different dimensions (subject-, social-, human-orientated). In complex learning situations, based on an analysis of the actual working processes, learners can develop their competencies in reference to the actual working processes in their enterprises. Learners then can use complex learning tasks to reflect their experiences with a scientific background. This kind of learning is not only beneficial to German youth. It could help entrepreneurs in countries with high rates of unemployment. It is challenging to design appropriate learning situations and complex tasks, considering all the practical aspects of organizing settings, performing the teaching process, evaluating its results. The theoretical and practical approach has to be taught in teacher education. Research has to develop instruments to handle it.

I have designed a theory and method of levels of reflection (Hartmann 2005) that should help structuring complex processes in work activities and in multiple interfering educational processes. Following, I want to present this theory and method in the context of problem-based learning.

The theory of reflection levels

The theory of reflection levels assumes that learning is generally not an act of keeping something in mind, but a process that induces an opportunity for behaviour that efforts a reasonable outcome. For this, it is necessary to adapt information to existing mental concepts (Piaget 1971), to develop dynamic concepts in different dimensions (like psychomotor and cognitive or subject and communication) and the ability (as inner disposition, Erpenbeck 2007, p. XI) to transact in diverse situations and varying contexts of the concerned domain. This is what "competence" means for me. Thus, learning is a process of gaining experience **and** of distancing oneself from direct perception, through recognition of conditions and reasoning, about one's acting in relation to the aims, of which one must become aware of this process. This means:

If we act in a situation and are not experienced in its domain, we take the situation and the circumstances for granted. Usually, we initially do not think about our intentions, but we are in possession of them (Husserl e.g. 1973, 1982). To reach our unconsciously aims, we have to look for starting points. At this point there are four possible scenarios: a) we think about an object or a context; b) we just do something successfully – thus, there is no need to further think about it – or c) we act more or less (un)successful (according to Donald Schön 1983[1]: causing

1 Great thanks to Alexander Schlag (Singapore) for his hint to the oeuvre of Donald Schön.

"reflection in action". This means as a practice, we "suggests not only that we can think about doing, but we can think about doing something while doing it" p. 54); d) we step back and think about a problematic situation (called "reflection on action" according to Schön).

a) Often the situation confronts us with a main object, so that we think perhaps about its attributes or characteristics. In general, we want to manipulate the object or the situation, respectively. In consequence, we will analyse the object empirically and construct "true"[2] knowledge of it. Though we may read something about similar objects, their attributes, the categories and classifications, we often do not contextualise it. This generally leads to subject-oriented learning. The work piece, for example, consists of metal. However, metal is not metal: lead or copper are different from carbide, and we can analyse the atomic structure to understand why; though, this knowledge must not take effect on the acting.

b) Doing something in a more or less successful manner, we navigate through the process, get links and hints for the next step and in this way gain experience. This can happen in a "flow" (Cszkszentmihályi 1975). While the process is under way, we develop tacit knowledge. The way in which this takes place has been discussed by many authors (cp. Michael Polanyi 1958, Gilbert Ryle 1949, Dreyfus & Dreyfus 1980, Donald Schön 1983, Georg Hans Neuweg 2004). Tacit knowledge is somewhat inscribed in the body. The authors agreed that it is more than the actor can say. This kind of activity is reserved for experienced workers. If they, for example, handle a work piece, they know intuitively which kind of tool they have to take, how the procedure has to take place, how the body is to be positioned etc.

c) Doing something intentionally, but unaware, we may be more or less unsuccessful. Because of an exposure to unsolved problems while acting, we are forced to take note of some of the *direct* conditions and requirements that cause us not to reach our goals. We have to "reflect in action" to regulate our acting. We can use the knowledge that we gained in situations that we had negotiated before, while this situation is unique and our attention is tied to it. That means: we do not reflect in a fundamental way, but according to immediate needs. To work on the work piece, for example, we can handle the file. If we have an assortment of files, we can test and change them. If the surface is still uneven, the clamping of the tool could be responsible for it.

d) If a situation is both familiar *and* unfamiliar, we step back and reflect about the problematic situation, so we can perform problem framing and problem solving (p. 138, "reflection on action") in a fundamental way. This reflection is process-based (possibly as anticipation of a complete act, containing diagnostic, problem structuring, decision making, operation and proceeding, evaluation) and it is therefore different from item a). If there is a problem with the handling of a tool, for example, we become aware, that this is just

2 The discourse on trueness I have discussed in Hartmann (2005), chapter 2.

one of the steps to produce the sophisticated work piece. The question is, whether it is a need for this step or there are other possibilities for problem solving.

Some differences between the items may be subtle, so they might blend into one another. But, each is relevant, because they generate different procedures and experiences. Although I agree with the proposed items, for the educational contexts, it is more interesting to again and again reframe the process of problem-solving in the similar, as well as more or less different situations (different in time and by the experience of the actors in their domain). Dreyfus and Dreyfus (1980) analyse the learning process of riding bicycles, playing chess and in pilot training. They specified a "five-stages-model of mental activities involved in directed skill acquisition" (from novice to expert). They were convinced that competences are growing in the process; it is not possible to educate them. Such, it is confirmed that one cannot explain in detail, to a novice, how to ride a bicycle and thus enable her to ride it. If a novice thinks about "riding the bike in the correct way" while riding, (s)he will have an accident. Dreyfus & Dreyfus do not deny that a trainer-supervisor can help the learners. But in general, such help could only be administered through rules, given to master the situation. They deny that there could be a planned, systematic and cognitive way of education and training.

Contrary to the authors and in accordance with a moderate constructivism, learning processes need to be planned in a systematic way, even to the point of direct instruction. Planning is based on the concept of learning situations and aims to create developmental tasks for individuals. Moreover, the objective of the theory of reflection levels is to systematize learning situations and to make individual challenges visible. This objective builds on the concept "from novice to expert" by Dreyfus & Dreyfus. "Novices" (first stage) need different developmental tasks than "competent" (third stage) individuals. Questions for typecasting could be:

- What is the typical approach in a situation? This could be for instance, mastering the challenge (more or less extrinsic) or unawareness about own intentions (e.g. concretization of aims or separation of own and extrinsic motivations)?
- What are the requirements individuals (e.g. a novice in this, but with experiences in other domains[3]) have to meet before acting (e.g. unawareness about own intentions, lack of skills, knowing potential proceedings)?

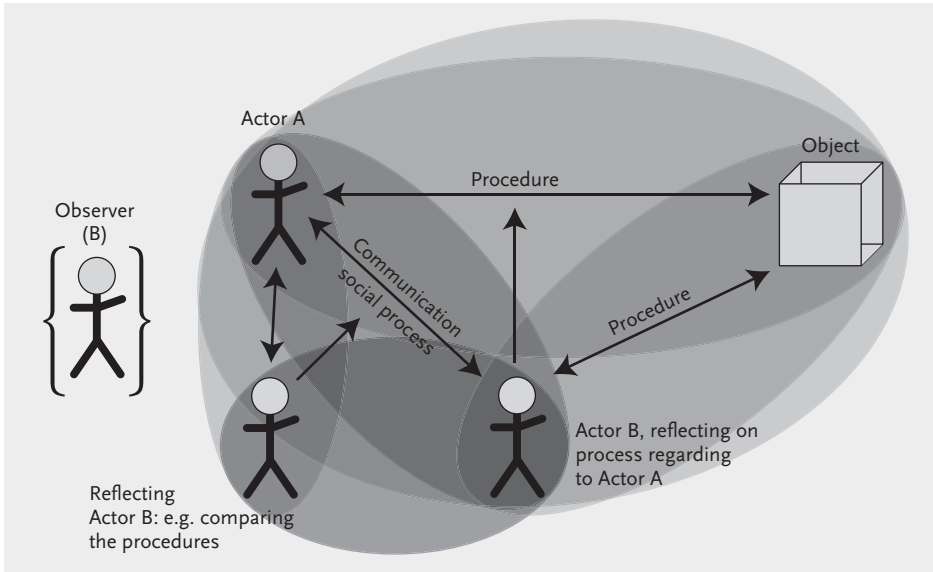
If we step forth to higher levels of expertise, the lower levels remain inherent, though in many ways "modified" and transformed. It seems that, in general, this leads to new situations. In reality, this is not the case. To make the interdependencies inherent to a given situation visible, it appears useful to structure it into levels.

3 Here, I want to point out a misconception by Bernd Lederer (2014, pp. 479) discussing my book "theory of practice" (2005). The problem is, that we have to account for three aspects: 1. History of reflection levels (I carved out eight levels in western culture since the renaissance and up to the year 2005; they affect the development of society, economy and technology), 2. Experiences (and possible reflection levels) of the individual and 3. The actual situation that is at hand. The actual situation, inter alia, depends on material circumstances (e.g. infrastructure systems). In actual situations, the historical and individual status as well as the material circumstances have to be considered.

Such, one bears in mind the complex interrelations of these levels and the interconnection between actions (e.g. in dimensions of cognition, psychomotor, affective or sorted by types of competences).

The method of reflection levels

If we train teachers to organize learning processes, that refer to special working processes (for instance in specific enterprises), then we have to account for the different levels of action and of knowledge. Each level is included in the next and binds to the next with preconditions. Every reframing reflection points to the more fundamental conditions that can be recognized within the frame: First, every time we are acting in a situation, we do it with some kind of intention; second, in process we realize what we want to do for instance, with an object, or in which way we apply a procedure, and how much effort is required, or what skills we do not possess. Because we recognize we can change the procedure; we are able to develop our skills; we can determine, which aims are really important. While we are realizing the important aims, we are objectifying ourselves. On the third level, if the activities are not successful, we must think about us, as actors in particular contexts, and about our aims in relation to the object: Are these aims making sense? Is the object suitable, we deal with? Consequently, we may choose a different object, a different procedure, different tools, and so on. – This is the aspect of the work in enterprise we need to analyse and understand.



Particularly in the educational context, this is valid, because the learning processes are mediated in multiple ways: As teachers, we have to consider the challenges, which we want to offer to the learners in a learning environment (for example

regarding to produce a sophisticated work piece of specific material). The learners' tasks are interrelated to the teachers' tasks. Based on a reflection about communication, the actions of the learner and/or the feedback from the learners, we can encompass a triangulation:

- the learner's intentions,
- how his actions were guided by us and how we have to correct the acting,
- which information we have to make available about the concerned subject disciplines, and how we inform the learner about it.

In this way, I hope, the theory and method of reflection levels support the planning of complex VET teaching situations in Germany, as well as in other countries, even of the "third world". To achieve this, VET-teachers have to know both the professional interactions, e.g. in farming, craft, industry and/or service (as domain experts) – and the associated teaching activities in school (as professional teachers). The analysis of professional situations helps to identify and differentiate the most important challenges, tasks and competences. An example is the installation of an off-grid-system for a private home or a village based on a costumers request. In the same field, but much more complex is the installation of the hybrid electrical system for a fish market or hospital that consists e.g. of the components photovoltaic system, windmill and diesel generator set. Based on this tasks and depending on the competencies of the students (perhaps they worked before in informal sector), more or less complex learning situations have to be elaborated and structured via different reflection levels. This and considerations targeting the challenges of the labour market, led us during the development of a curriculum for further education in photovoltaic in cooperation with institutions in Senegal (see the article of Eric Wendkouni Sawadogo at this conference). We hope that this supports the growth of employment to a level of prosperity entrepreneurship.

Conclusion

The theory and method of reflection levels can be a good tool for the analysis, planning, and development of complex learning situations. It opens the eye for the structure and the logic of the work and action processes (and the methods used) at different levels. It shows the dependencies and interactions which are in complex situations of the practice or in the mind of the various stakeholders. Whether we deal with the production of work piece due to an order of a customer, with various techniques (such as drilling, filing or milling) and appropriate tools or with the installation of a simple PV home system, taking into account the conditions and the financial aspects. In either case, the facts (e.g. to the materials to the system to the relevant interactions, processes) and the execution of the procedures have to be learned. But more than that: The complex interactions of materials and systems have to be understood in process of production, of installation, and of use of the products and systems (quality assurance). Furthermore, they must be understood as interaction in problem fields e.g. of natural science, technology, ecology, and as social, economic and cultural interactions.

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Further Education for Technical and Vocational Education and Training Teachers at Pedagogical University, Maputo

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Abstract

Technical and Vocational Education and Training (TVET) plays a major role in preparing skilled workers for the labor market in Mozambique. In recognition of this role, the government has prioritized in its strategic plan the improvement of teachers professional development at all levels of the national Education System (SNE). This has culminated in the Professional Education Reform (REP) in partnership with the private sector, civil society and international organizations. One of the main objectives of the reform is that all policies, programmes and strategic plans of education in Mozambique should be aligned to training, construction and resources (material and human) of all professional education subsystems. This objective will be achieved through a process of development of training and improvement models and curricula while securing the business sector in order to promote economic and social development of the country. In line with this, the Higher Technical School (ESTEC) and its German partner, Rostock University, jointly designed a project for the TVET teacher training quality improvement in Mozambique. The programme is a design-oriented, cost-effective, integrated and decentralized model for teacher training. In this joint initiative, Rostock University supports the initiated reform process in the Mozambican Vocational Education system through the Vocational Education Training Network (VETNET). VETNET encompasses three universities in Sub-Saharan countries, that is, Jimma University in Ethiopia, Witwatersrand University in South Africa and Pedagogical University in Mozambique. The central idea of the programme is to conduct a master training of trainers whose task is to train TVET instructors on vocational competencies and open avenues for shared use of laboratories among the TVET institutions. This study sought to analyze this Further Education project for Technical and Vocational Education and Training (TVET) teachers at Pedagogical University in Maputo. The findings of the study

point to a need to restructure teacher training in Vocational Education particularly in curriculum development and design of didactically rafted lesson plans. In addition, Further Education programmes should be enriched to foster continuous development not only in the professional qualifications and skills, but also in the furtherance of general knowledge, development of values of independence and responsibility that are indispensable in today's world. The study concludes that despite efforts by the government, there is still low efficiency and quality in Vocational Education teacher training in both technical and pedagogical skills.

Introduction

The history of TVET teacher education in Mozambique dates back to as early as 1980 when the Industrial Pedagogical Institute of Nampula specialized in training of Professional Education teachers in the various technical disciplines. Prior to this, primary focus was on technical staff training to support TVET. Besides the training of technical staff, there was also intensive teacher training courses for this subsystem whose potential candidates were the finalists of Commercial and Industrial Institutes. These trainees received psycho-pedagogical training, in addition to technical training. From 1983 to 1987, Commercial Institute was born to train teachers for commercial schools (MINED, 1992, pp. 41−43). However due to various factors such as low wages and other forms of incentives, shortages of expertise in such areas as economy, administration and construction, several teachers left the TVET system. This move increased gaps professional technical education in the country.

Furthermore, the closure of the Faculty of Education at Mozambique in 1986 aggravated the situation of this subsystem as most teachers trained to teach technical subjects were required to teach general subjects in the national education system. The solutions adopted to circumvent this lack of teachers in some subjects specialties (mainly the industrial sector), was the hiring of professionals, who were not trained teachers, to teach this courses. These professionals were enticed into teaching by the award of scholarships for training at Pedagogical Institutes and abroad. The other incentives to ensure the retention of effective teachers in the TVET system included improving the wage situation of teachers and ensuring the implementation of training actions (logically supported by sponsors and international NGOs). In addition, the government allowed the private sector to set up technical schools and offer courses that addressed their needs (MINED, 2000, p. 15−68).

From 1989, decentralization was adopted in hiring of teachers and management of education was passed onto the Provincial Directors of Education. Thus the top managing structure was then freed from bureaucratic issues and remained only with responsibilities of policies making and strategy formulation (DINET, 2009, p. 78). It was in this context that the Provincial Educational Direction got involved in administration and management of educational policies in the provinces.

Methodology

The study targeted 1,700 participants comprising teachers, students and pedagogical directors. Structured questionnaires were administered during data collection that was conducted in the period November 2014 and December 2015. There was found that 580 active vocational teachers had no pedagogical training; 380 had never attended a teacher training institutions and 740 were teachers, but had never take part Further Education. That is meaning we have in Mozambique:

- 580 was teacher who do not have pedagogical component
- 380 were teacher on-Job-Training
- 740 were real teachers, but they do not take part in continuous building

From these data collection, it was clear to us that, the Vocational Education system has not only problems of pedagogy, but also has a teacher shortage. These and other findings helped and motivated us to develop a project that is described at the end of this chapter.

Empirical Results

The foregoing discussion shows that there are no well-structured systems for training of VET teachers in Mozambique. Hence, there is need to use the experience gained from the project between Rostock University and ESTEC to establish a local network of Mozambican teachers with UP and other TVET institutions. The teacher training strategy in the project aims at establishing a clear link between research and quality in teacher education. Firstly, research is the instrument through which contributions to the educational process can be developed in order to improve the overall quality of the product. The subsystem of the Professional Education recognizes the important contribution which the research can give to its planning for the sub-sector, for the development of practice, and for the formulation and evaluation of quality indicators. Secondly, teacher education policy is designed to improve the quality of all the provision of teacher training, in order to establish national standards for teacher training, and quality assurance systems (MINED, 2002, p. 45−89).

The teachers of the Mozambican school system were unanimous that they wish to enroll in teacher training courses offered by the Pedagogic University (UP) in order to improve their delivery of content in their classrooms. Teacher training courses aimed at improving education in the classroom run for six months, a period that marks the end of the academic year. Teachers have the opportunity to improve their skills through training in the classroom, because many teachers don‘t have the pedagogical component, particularly in Engineering and Information Technology and Communication, where we have more difficulties in recruiting.

Although the majority of those professionals having deficient skill in the didactic, pedagogical and methodological component. The fact that they are successful pro-

fessionals does not mean they have the ability for University teaching. To compensate for this shortcoming, the Pedagogical University for example, promotes annual training courses in methodology for their own teachers at different levels and different degrees (Master and PhD) in collaboration with its cooperating partners. The training prepares teachers on how to plan lessons, improve their teaching and evaluation of student learning. These courses are offered at two levels; in-house training of teachers at UP (which is discounted) and externally to teachers in other institutions who want to improve their knowledge.

The Pedagogical University is traditionally one of the institutions dedicated to teacher training for all levels of the national education system. But for many years, UP has not been able to fully meet its objectives, for example, teacher training for the subsystem of Vocational Education. In 2006, some colleges of this institution started with a new range of technical courses, something that did not constitute their routines, although this task/activity was envisaged in the strategic plan of the former MINED and the statutes of Pedagogical University. This movement led to the creation of two schools in 2008, one for technological sciences, (the Technical School – ESTEC) and another for accounting, (the School of Accounting and Management-ESCOG). The creation of these two schools forced the Pedagogical University to design a strategic plan, which could empower the two schools, both in human and material resources. To ensure sustainability of the two schools, the Pedagogical University in coordination with its cooperation partners provides not only annual training courses for teachers, but has also drawn a clear policy of faculty training at different levels (Master & PhD) for the different areas of knowledge. The other intervention that the Pedagogical University has included and implemented in its strategic plan is the continuing education programmes, where teachers also teach mini-courses for their colleagues who are enrolled for continuing education programmes. The only requirement for this co-teaching is that it must be for an appropriate programme that is institutionalized and approved by the academic and university council.

Teachers' In-service training

The task of training teachers in private institutions of Higher Education goes beyond the simple idea of "help" home teachers. Training programmes serve both to improve the faculty lecturers' qualifications, and to improve the students' learning and, consequently, the quality of the IES. According to Center for Applied Social Sciences at the University of Mogi das Cruzes, unprepared teachers for the university teaching practice seriously scratch the image of IES, with serious consequences in the market. The fact of having a master's degree or doctorate, or be a successful expert, does not mean that this professional is an educator or to have skills and competencies in didactic-pedagogic terms.

Therefore, it is necessary to create a space where professionals can be trained for the exercise of their profession, whether inside or outside the institution in which it operates (Fernandes & Aaditya 2009). To compensate for this shortcoming, the

Pedagogical University for example, promotes biannual training courses for all teachers in the following disciplines: Didactics, methodology, planning and class simulation and preparation of research projects. At the moment, the UP tries to formalize continuous Teacher Training in Mozambique and they know that teachers training is the most viable option to improve student performance. This project would involve all teachers with the condition that they have to be an active teacher in any public school. As it is at the initial phase, that's way there are no results yet, but it has a huge number of participants. That is why it is impossible to measure the success, but looking at the demand, we predict it will bring positive results.

In this chapter follows a short description of the project. From these data collection, we can say, one of the solution to this problem is that Mozambique soon needs to create a training center for teachers in service that will be used by many institutions.

From that finding, a training programme has been developed, which was implemented gradually as intensive course. We explained to our partners (University of Dresden, Magdeburg, Rostock, Oldenburg, and UFRGS etc.), that our problem is Human Resources Development. In the research, we found that one of the ways for improving the quality of the learning process is continuing building, but also teacher training. The empirical results make clear that not all teachers are pedagogues and never took part in a continuing and Further Education programme. In Mozambique from eighties and nighties, there has been no proper vocational center for teacher trainers and continuing education.

Tab. 1 The table shows the demand for teachers in the subsystem of Vocational Education.

Year	**Province**									
	Mapto	Gaza	Sofala	Inhabane	Tete	Manica	Zambeze	Nampula	Niasssa	CD
2017	57	28	27	29	19	37	37	50	24	75
2018/2019	261	554	238	353	135	68	70	50	74	47
subTotal	318	582	265	382	154	105	107	100	98	
Total	**2.233** **383 in 2017 and 1.850 in 2018/2019**									

Tab. 2 Training Programme as Temporary project result

subject/Module	Code	Month	Time			Crédit	Note
			Total	Contact	Independent		
Didactic	EV 001A	I	150	80	70	6	Obligation
Methodology	EV 002A	I	150	80	70	6	Obligation
Pedagogical	EV 003A	I	150	80	70	6	Obligation
Seminar I	EV 004A	I	50	–	50	2	Obligation
			500	**240**	**260**	**20**	
Didactic	EV 001B	II	150	80	70	6	Obligation
Methodology	EV 002B	II	150	80	70	6	Obligation
Pedagogical	EV 003B	II	150	80	70	6	Obligation
Seminar II	EV 004B	II	50	–	50	2	Obligation
			500	**240**	**260**	**20**	
Methodology Pratices	EV 001C	III	150	25	125	6	Obligation
Didactic Pratice	EV 002C	III	150	25	125	6	Obligation
Pedagogic Pratice	EV 003C	III	150	25	125	6	Obligation
Seminar III	EV 004C	III	50	–	50	2	Obligation
			500	**75**	**425**	**20**	
			1500	**555**	**945**	**60**	

Conclusion and Recommendations

Although there is a strong research culture history within the university sector in Mozambique, studies are usually academic and theoretical. The current research provides a small contribution to the practice in the classroom to the planning subsector of teacher training, besides not being able to involve the stakeholders in the classroom training institutions for teachers and schools. To establish a proper culture of research and quality standards in teacher education, the study proposes the following measures.

- Consultation with provincial departments and teacher training providers to identify priority research areas.
- Introduce a culture of research in all teacher training institutions and the emphasis of the research will be focused on the need to deepen the knowledge and exchange of experience.
- Set national standards for teacher training and task each teacher training provider with the responsibility to draw its own internal control and quality assurance.
- Develop a common curriculum for teacher training for the Mozambican Vocational Education system.
- The Scholarship Institute (IBE) should extend scholarships for continuous professional education of Vocational Education teachers in teaching methodology, pedagogy and practice.

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Fundamentals of the development of Vocational Education and Further Education of VET pedagogues in Sub-Saharan Africa

Friedhelm Eicker

Abstract

For many years, the University of Rostock/Technical Education has supported three universities from Mozambique, Ethiopia and South Africa in their effort to establish a modern educational and further educational programme for VET pedagogues. A Further Education network was established in the first steps. If more German universities support it, this network can expand to various other Sub-Saharan African countries.

This still poses the essential question which scientific approach will be the basic position. Furthermore the question is how the Further Education network of universities, vocational schools and other VET institutions should be developed locally in Sub-Saharan Africa. A constructivist approach, which is positioned between academic discipline and vocational science, will be proposed here. In the first place, university lecturers and selected teachers will be able to acquire shaping competence. A "Train the Trainer Further Education System" will be proposed.

Fundamentals of the development of Vocational Education and especially of the Further Education of VET teachers in Sub-Saharan Africa will be presented and motivated: the shaping-/competence-based and networked teaching and learning. Expectations on the development of the planned "Train the Trainer Further Education System" will be outlined according to former projects of the University of Rostock/Technical Education. It will be argued for creating and implementing a highly-flexible shaping-/competence-based and networked "Train the Trainer Further Education System".

Keywords

Vocational Education and Further Education, "Train the Trainer Further Education System", shaping-/competence-based teaching and learning

On the situation of Vocational Education and Further Education – based on projects in Mozambique, Ethiopia and South Africa

Many years of cooperation of the University of Rostock/Technical Education with the Pedagogical University of Maputo (Mozambique) have shown that it is not only the initial qualification of VET teachers and of all other VET pedagogues which is in need of a fundamental reorientation and development. Perhaps even more important is the reorientation of the further educational programme of VET pedagogues, who already work in VET schools, in companies and in other vocational educational places. This is most relevant for VET pedagogues, who deal scientifically with Vocational Education and who work at the Pedagogical University of Maputo and in its branches all over Mozambique (see i.a. Mucauque, 2010). The essential question came up which scientific approach should be applied, and how Further Education programmes for VET pedagogues should be developed regarding the locally determined possibilities. Two projects (LEFOMO, 2009–2010, and LEKOM, 2011–2012)[1] made use of a constructivist approach, an approach positioned between the relevant academic discipline and vocational science. At first, this constructivist approach, with an orientation on vocational science[2], allowed university lecturers, in cooperation with teachers and other VET pedagogues, to acquire shaping competence in a networked environment in different places across Mozambique (see University of Rostock/Technical Education, 2012)[3]. But it was obvious that the shaping competence, acquired through both projects, was not sustainable. While transferring the positive results of the projects, it became visible that in other Sub-Saharan countries too, there is the need for a shaping-/competence-based and networked approach for Further Education of VET pedagogues, which is adapted locally and oriented on a constructivist and vocational scientific approach. Smaller projects[4] together with the University in Jimma and the University of the Witwatersrand in Johannesburg could achieve the establishment of this approach in South Africa, Ethiopia and Mozambique and further develop the activities in Mozambique. As it turned out, the effort for a sustainable Further Educationof VET pedagogues led to an organized and networked Further Education system which was accredited by all. It should be possible to (further) develop the system cross-national in Sub-Saharan Africa with

1 LEFOMO: Teacher Education and Training in Mozambique; LEKOM: Teaching and Development Expertise for TVET Teachers in Mozambique.

2 The project partners entered a field, where scholars have been working on a constructivist foundation for general and vocational didactics for many years. This was ambitious because the (radical and) favoured moderate constructivism cannot be assigned and accounted to any traditional and scientific theoretical based approach. The pragmatic constructivism was sympathised by many. It was and still is assumed that the pragmatic constructivism can be accounted to the context of the dialectical and dialectical materialistic sciences with the focus on the demands of vocational sciences. Therefore it is useful for VET. Here, it cannot be dealt further with this topic. See e.g. Jank & Meyer, 2011, especially p. 133 f., 144, 187 ff., Rauner & McLean, 2008, Eicker & Haseloff, 2013, p. 11 ff.

3 Regarding shaping-/competence-based and networked education see i.a. Eicker (2009).

4 VET-Net-YoS: Initiating the further education and research network for VET professional educators in South Africa (in the German-South African Science Year 2012/2013); VET-Net: Development of an Education and Research Network for VET Professional Pedagogues in Sub-Saharan Africa (2012–2015). See i.a. Eicker & Team, 2013.

(temporary) support from other non-African countries. The system should be directed by a university and designed together with regional partners from VET schools, companies and other vocational educational environments. It should consider various pre-existing competencies, expectations of the participants and their possibilities of participation (see i.a. VET-Net Colloquium, 2013). The implementation of this system will become even more challenging after, fortunately, VET pedagogues from various Sub-Saharan countries, e.g. from Namibia, have shown interest to cooperate in the Further Education network. Also vocational scientists from German universities offered their support. The next task will be to outline a concept for a sustainable Further Education system, which meets local standards and expectations of the participants and which allows a shaping-/competence-based and networked Further Education for VET pedagogues from the various Sub-Saharan countries. Perhaps the designed and established system will be put to the test thereafter.

Main expectations on the development of a Further Education system for VET pedagogues

The project VET-Net made use of a pragmatic approach in the Further Education of VET pedagogues in Sub-Saharan Africa (and elsewhere). Some remarks and open questions related to it:

Vocational education is dominated by academic disciplines all over the word. VET pedagogues need to teach their learners technical science, economical science and other academic disciplines which are reduced didactically. Following this idea, it seems obvious that the pedagogues need to have appropriate academic knowledge in technical, economical and other sciences. This means that VET pedagogues are mainly professionals, who have more or less pedagogical or didactical knowledge and lack appropriate methodological skills. Further Education programmes of these VET pedagogues could focus on updating academic and pedagogical knowledge and on updating didactical and methodological skills.

Parts of Germany (mainly Northern Germany) and other few countries, e.g. regions in China (mainly in Beijing) are questioning the academic scientific approach on Vocational Education and are arguing for a vocational scientific approach instead[5]. The (relevant) vocation – the relevant and prospective professional tasks – must be in the focus of the Vocational Education. The learners should acquire competencies independently, which enable them to (co-)shape their professional tasks in future.

Vocational knowledge, combined with technical and economical knowledge, is necessary for this and must be applied reasonably after having taken possible alternatives into account. The relevance of this knowledge is put to test "practi-

5 Concerning the debate between a vocational science approach and an academic science approach as basic orientation of vocational education and the further education of teachers see Hartmann u. Eicker, 2001.

cally" while acting. It will be even better if every action is justified individually and in general (social justification, operational justification, etc). Educators must arrange the processes for the learners to acquire shaping competence. The learners must be put into situations in which they have to acquire shaping competence for themselves with the help of the educators. This educational approach, which is orientated on vocational sciences, does not simply require a professional VET pedagogue, who has (isolated) pedagogical, didactical and methodological skills and knowledges. Rather, educational tutors are needed, who are able to follow the whole (complex) educational path: Starting from specific working processes (which are or will be relevant for learners), to main working and learning tasks (which need to be identified) and the arrangement of educational situations (where the learners solve the tasks and acquire the relevant competencies while solving the tasks). This can be done in the classrooms, in suitable educational environments, through suitable educational media and by using the full potential of the educational environments of schools, companies and other environments; or by using the joint potential of all the various environments (see Eicker, 2006, more detailed in Eicker, 2007, especially p. 22, and Eicker, 2009). To follow this path, VET pedagogues in Sub-Saharan Africa need to acquire these complex (working and teaching) competencies at first through Further Education in order to tutor their learners in the acquisition of shaping competence.

On the one hand, the projects in Mozambique, Ethiopia and South Africa have developed much acceptance for the vocational scientific approach. The justification for this was that only a shaping-/competence-based approach in Vocational Education can lead to real education, and that the main focus of Vocational Education of professionals and workers must be on working processes (and not on techniques etc.). The reasonable consequence was to develop a constructivist educational concept (based on scientific theories), which deals with working processes as an action and therefore learning/shaping is a social and individual action. This approach formed the fundamental basis of the planned educational concept, which still needs to be tested in practice. First steps could realize this (see Eicker & Haseloff, 2013).

For this constructivist/vocational scientific approach, relevant competencies are needed or need to be developed sustainably under the pre-existing conditions for Further Education in the near future. The projects proved that these competencies could hardly be found in the universities of Maputo, in the project-related branches, in Jimma and in Johannesburg respectively in the university towns (apart from the participants of the project and selective educated VET teachers in VET schools).

The problem is that vocational pedagogues with various educational backgrounds work at the universities in particular. The spectrum of the competencies expands from restricted competencies solely in academic sciences to restricted competencies solely in the pedagogical or didactical/methodical field.

The projects made clear that an academic orientation and a vocational scientific orientation cannot be seen as alternatives for each other (they are not mutually

exclusive). The further development of the (regional, national and international) VET systems includes the universities and makes use of their leading (scientific) role, it includes the Vocational Education and Further Education of vocational scientists and vocational pedagogues and it includes the education and training of the trainees. Therefore, it can be expected that, basically, work processes will be taken into account in the context of educational expectations, which include related professional, technical, economic and/or social knowledge, and which lead to the acquisition of action competence or even better to shaping competence.

Fundamental and more or less open questions are: How can (prospective) work be taken into account, as it will be justified by (prospective) vocation? How can the relevant academics/academic disciplines still be included appropriately without losing acknowledged academic knowledge? How can it be achieved that shaping competence will really be acquired (and that not only any action is the aim but – as alternative – shaping with regards to future expectations)? What basic consequences derive from a justified basic position, which is defined in that way, for the (further) development of VET and for the education and Further Education of VET pedagogues (with regards to the real possibilities of implementation and realisation)? Further questions still need to be solved.

General remarks on the planned design of the Further Education system

The (further) design of a promising Further Education System depends on the current VET situation in the countries of Sub-Saharan Africa and elsewhere[6]. Answering the following questions could be crucial in this respect: How is the respective VET system basically structured? Is a systematic Further Education for VET pedagogues already present? What role will the universities play possibly? Is there potential for Further Education in the VET schools or in other vocational settings? Who are the participants of the Further Education and how were they recruited? What degree of (academic) education do the participants already have and what degree can they achieve? This also includes: What is the workload for the participants (and therefore, can the Further Education be intensified)? How are the operational and working competencies of the teachers of the Further Education programme rated? How can the educational possibilities be rated, which are relevant for Further Education (in the universities, in VET schools, in companies, Research & Development institutions etc.)?

Probably, it must be assumed that the (further) development of the Further Education for VET pedagogues in the countries of Sub-Saharan African can only be re-

6 Therefore it is necessary and helpful that the African participants of the Symposium present "their" training and further education system and the further education for VET pedagogues, and that they present possibilities of the further development of this system. Insights of the participants of Mozambique, Ethiopia and South Africa from the preceding projects can serve as a suggestion. It is also helpful that non-African participants present their relevant experience and contribute with this experience. Consequences of this need to be discussed.

alised extra occupational and as practical as possible. Single Further Education modules have to be planned, after which participants can drop out and where they can rejoin sooner or later. Special modules or rather learning projects seem suitable for this, where step-by-step the acquired competencies (in the field of VET pedagogy, vocational science, professionalism) increase and certificates/qualifications can be attained. The Further Education sessions (modules, learning projects) and the outcome must prove advantageous for the professors/lectors and teacher as soon as possible. Following the basic position outlined above, it makes sense to focus in detail on the working tasks of the participants of the Further Education programme. If this applies, the following questions need to be solved: How can such a highly-flexible Further Education system, which is oriented practically, be structured in detail? How can the single modules/learning projects relate to the working tasks of the participants of the further education/of the learners? How can certificates on (shaping-) competencies be issued usefully? How can the initial qualification (competence) to enter an advanced Further Education programme be assessed etc.?

The projects preceding this Symposium have proven that creating and implementing a Further Education system can be successful through joint efforts, so called "Further Education network" – at least more successful as if the partners "only" cooperate or if each partner works on its own. The initiative and contribution of more advanced partners is especially important – at least in the initial phase. The cooperation and the task to implement a Further Education system together, which meets regional characteristics, expands the scope of design: The (various) experiences by advanced partners can be used in order to ease the first steps. This makes a permanent exchange of ideas possible and it allows to detect mistakes and misleading ideas/wrong tracks earlier. New competencies, structures and contents for the Further Education programme can be identified, implemented and acquired fast.

Open questions still remained during the preceding projects: Do we have to consider different mandates of Further Education in the countries/regions and how can we meet these standards? Are there any barriers or obstacles, which prevent the "synchronization", and how can we break through these obstacles? Does the content of the Further Education programmes differ and what are the consequences for the joint effort? These and further questions need to be considered and solved.

The given cultural differences and economic possibilities for the design of a Further Education programme need special consideration in the joint effort and cooperation. In particular, this concerns the African countries (and, of course, the specifics of the cooperating non-African countries). Preceding projects did not see these differences for too long or did not take them into account. This had an impact on the success of the projects. Therefore, the question is posed, whether (and how) a shaping-/competence-oriented and networked Further Education for VET pedagogues can be termed as a desirable development strategy in the process of VET in Mozambique, South Africa and Ethiopia. This includes the question, how potential for design can be used and developed in the various countries of the African partners.

Outlook

The hope is that this Symposium and the following pragmatic approach will pave the way for the "Train the Trainer Further Education System" (and that the open questions will be solved). The experiences from projects preceding this symposium led to the development of a first proposal for a "Train the Trainer Further Education system" (TtT-System). It will be presented on another occasion during this Symposium (see paper by Gesine Haseloff).

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The Train the Trainer-System – Results of a research and development project for and with VET pedagogues in Sub-Saharan Africa

Gesine Haseloff

This paper argues for a shaping competence oriented further education for VET educators. A model of a Train the Trainer-System (TtT-System) in Sub-Saharan Africa is presented. It was initiated during a research and development project (Further Education and Research Network for VET Professionals in Sub-Saharan Africa, short: VET-Net). Requirements are named for this system. The approach is presented how these can be met.

It was the first step in the project VET-Net to establish a network of further education and research for and with VET pedagogues in Subsaharan Africa. Germany and three African countries and universities worked together: The University of the Witwatersrand (WITs) in Johannesburg in South Africa, Universidade Pedagogica (UP) in Mozambique, the Jimma University (JU) in Ethiopia and the University of Rostock in Germany. The cooperation between these universities evolved from Alumni Projects. Two scientists from each university were involved. They founded informal and thematic research teams. The international cooperation between the teams was closely related on the basis of the project. Several VET institutions, which cooperated with the African universities in the regions, were involved. The project led to the joint development of a model for a shaping competence oriented and networked further education system. The model is not a fully differentiated pattern of action. Rather it is an outline, which can lead the way to design a Further Education System.

Amongst other countries, Mozambique, South Africa and Ethiopia have to face the challenge to meet the requirements of the economy for well-trained professionals. Furthermore they have to fulfil the needs of the trainees and employees for qualifi-

cation and further education, which ensures a satisfying occupation and which can be fulfilled through existing educational structures.

The African partner universities considered it as their task to participate in solving these problems. They recognised their way in the expansion of the existing educational structures, in this case in the field of the further education for teachers of VET.

Taking the current situation into account, the scientists found that especially the VET staff could not meet the requirements for modern teaching and learning. An appropriate further education should be offered. The Rostock University, Chair of Technical Education, offered its support during the VET-Net project (Further Education and Research Network for VET Professionals in Sub-Saharan Africa). It was not promised to transfer further education according to the German model. The project partners developed a concept on the basis of vocational sciences, within the scope of specific social, cultural and economic conditions of the individual countries.

The possibility for learners to gain shaping competence by work on real working tasks was the basic idea for the planned further education concept. VET must enable learners to shape work within the context of conceptions basing on the development of society. Shaping competence is based on the creative quality of self-dependent action and on the content of individual leeway (Rauner, 2006, p. 57). Richter and Meyer (2004, p. 23) understand shaping competence as own actions that purposefully act on the personal, vocational and social environment and shape those. Therefore, it is necessary to look for alternatives, to estimate consequences of own actions and to decide on any procedure based on a justified evaluation. Preceding projects (Eicker and Mucauque, 2010; 2012) have shown that the requirements of the economy can be met with this approach. Working tasks were identified, which are relevant for the trainees in future. Learning and educational tasks derived from it. The tasks were designed in a way that supports self-reliance and self-activity of the learners and that suits their educational needs. The preceding projects have proven that competencies in autonomous shaping can be acquired and developed through these new educational approaches (Eicker and Mucauque, 2010; 2012).

Vocational pedagogues with various educational backgrounds worked at the three participating African universities. The spectrum of the competencies expands from restricted competencies solely in academic sciences to restricted competencies solely in the pedagogical or didactical and methodological field (Eicker and Haseloff, 2016). The African educational institutions – universities, colleges and educational administrations – sought a further education programme for their professors, teachers and educational administrators, which is effective and can be used directly and concretely. Furthermore the institutions and the VET pedagogues had a lot of interest in gaining a certified graduation as high as possible. In this way, the institutions want to become established and represent themselves as centres for the training and Further Education for VET teachers in their countries or their regions.

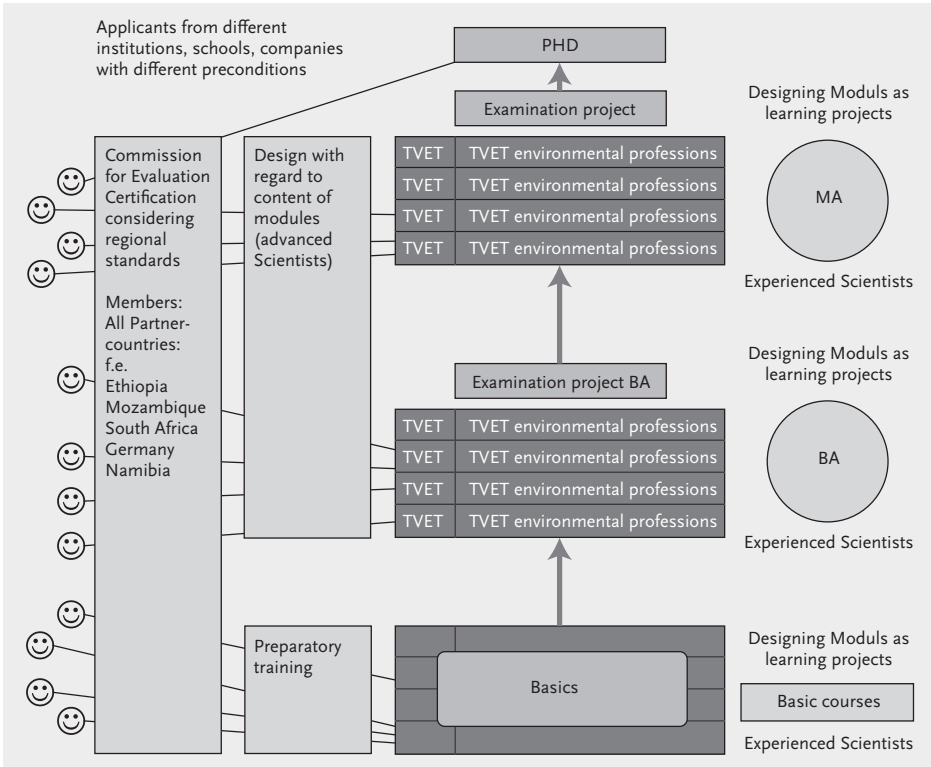
An (initial) network infrastructure was implemented. For that, regional single networks with companies, universities and colleges were setup by the WITs, the UP and the JU, and these networks were coordinated in cooperation centres. The single networks were linked with each other later to create an overall network (VET-Net), which should then expand systematically in the future. Smaller research projects were planned, executed and evaluated to accompany and complement the network. These should support to initiate and continue the planned further education programme and the setup of the network. First Further Education programmes were designed and executed. But these programmes were not implemented systematically and comprehensive. They took place from time to time and on special request. A more systematic design was desired.

It was possible for the partners and teachers, who were directly involved in the VET-Net project to acquire the relevant competence to setup and implement a shaping- and competence-oriented Further Education system (Eicker and Haseloff, 2016). But without possibilities for Further Education, other teachers will not be able to acquire the competence for shaping any time soon.

This led to the idea to develop a Further Education system, which ensures systematic Further Education – from the Bachelor to the Master to the PhD.

The VET-Net project partners decided to create an outline. A proposal was designed together at the workshop "Preparation of a TtT-System" (from 4th – 5th September 2014 at the Siemens AG in Berlin) with the VET-Net project partners, the University of Art, Berlin, and the University of Siegen. It was called Train-the-Trainer System (TtT-System). The project partners expect the discussion and development of the outline according to Grosfoguel: The idea of a procedural approach in the development of theories assumes that theory is not the final result of knowledge of an objective articulating scientist, which is valid universally. Rather it is – like any knowledge – an approach to the world, which is connected to location and stances (Grosfoguel, 2010). "Developing the system further should be part of a collective process and it should be the result of an interpretative process of social actors – here mainly VET scientists – to construct this approach to the world," (Wolf, 2009, p. 223).

The university lecturers from African universities, who deal with VET, will pave the way to develop and establish the TtT-System in cooperation (in a network) with each other. They take into account the respective cultural and economic conditions and cooperate with local partners in VET schools, companies and other environments, where Vocational Education takes place. Experienced scientist, who already designed and established Further Education study programmes, should support the development of the TtT System. Therefore, the network should expand to German partners too. The Technical University Dresden, the University of Siegen and the Alanus University of Alfter/Bonn offered their initiative and support.



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It is important to design the TtT-System highly flexible and for a heterogeneous target group from the VET field: The participants should enter, exit, re-enter before or after each module according to their possibilities in universities, schools or companies and they should therefore be able to further educate themselves throughout their whole professional life.

A commission for certification regulates the access to the Further Education programmes, checks qualifications and is responsible for admission and integration. The programme is open for professionals from any VET institution. But firstly, university lecturers and staff from the partner universities, regional TVET-teachers from colleges and trainers from companies are the main target group. They will be multipliers in the future to expand the system. It was very important for the African project partners that prospective students can be further educated extra occupational and therefore can still work in their institutions. They should be able to study in a highly flexible manner: Concerning the choice of the modules (learning projects), dates and times of their studies and the choice of their degree. Shaping-competence-oriented education should be made possible through consecutive modules or learning projects with increasing levels of difficulty. If the requirements for admission are not met by a participant, he or she will be able to attend basic or preparatory modules. It should be possible to advance from the

Bachelor to the Master to the PhD over two, three or four steps in the Further Education system.

Throughout the modules and projects, the participants identify, solve and evaluate educational tasks on their own, which are related to realistic and important vocational tasks in future and which are socially and individually justified.

The educational tasks are pivotal in each educational activity. If possible, the learners of the further education programmes should identify and justify them on their own. The learners acquire shaping competence when they pass through the five phases of complete action while solving the educational task. The five phases are: Gathering information, planning, making decisions, execution and examination (Pätzold, 2000). The learners pass through the phases on their own with the help of the teachers and they take into account alternative ways of solving the task.

The single modules (learning projects) should and must include vocational disciplines and it must be possible to differentiate between various vocational fields. This means that the modules (learning projects) are "internally" specialist oriented. The African project partners wished that firstly, the modules are oriented on technical vocations and vocations from the agriculture and environment. The modules (learning projects) allow to teach competencies of vocational pedagogy in an integrative manner. If it is necessary for individuals, special competencies will be offered parallel (e.g. building automation for technicians, resource conservation for professionals from the agricultural/environmental field).

All courses can be offered in a college, the university and, or in a company. The didactical and methodological potential of all VET institutions respectively of all persons, who are able to contribute to the further education regionally, nationally and internationally, will be used. The university and the respective competence centre should have a leading role. That allows them to keep a standard according to the vocational sciences. The system should be anchored in the region. That means that the students will be confronted with problems in the regional companies. The problems or tasks should be derived from real-life work processes. With their solutions the students will contribute to the work processes and to the development of the region. That allows them to initiate innovations in the companies and in their region. The planned "trial" approach of Further Education – networking of companies, colleges or VET schools and universities – makes relation to working processes possible and allows scientific reflection.

Relevant research and development projects should accompany the implementation process. The junior scientists and network partners will acquire relevant competencies for the implementation (this process has already begun appreciably in the project VET-Net). These competencies concern the design, the certification, the development of modules, the testing within the system and the evaluation. Furthermore, the scientists, who participate in the project, gain competencies in the management of international research networks. Consulting from experienced partners and scientists is inevitable during the phase of development in order to

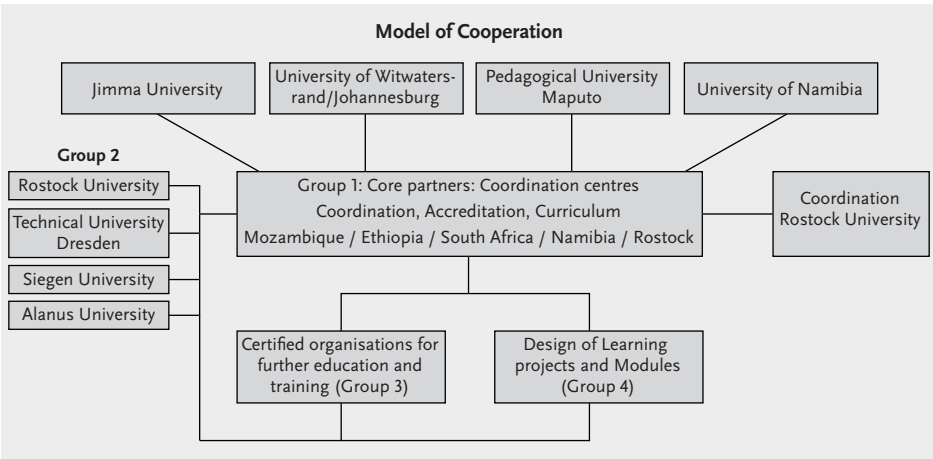
expand the quality in the widened network and to qualify junior scientists professionally. For that, the infrastructure of the network needs to be expanded.

The countries, who will participate in the project in the future, have developed a regional network on their own. Coordination centres, in future called competence centres, link these regional networks internationally. This makes cross-national exchange of resources and knowledge possible. Students and teachers can make use of the resources of the other participating partners.

The cooperation with lecturers from the various and different institutions does not only ensure the successful implementation of the TtT-System, it also opens up the possibility to reflect. The current international situation of vocational sciences has to be taken in mind, because it is inevitable for orientation on modern Vocational Education.

It can be considered to include other Sub-Saharan African universities and international partners in the reflection and invite them for further discussion, as it was done at this symposium.

Finally an example for the cooperation in the further education system is presented:



It is planned that the group of the core partners of the Universities of Rostock, Maputo, Jimma, Johannesburg and Namibia (Group 1) communicate on a regular basis regarding basic questions (design of the TtT-System, consolidation and expansion of the network). Another issue will be the development, implementation and testing of the curriculum. The group 1 will also initiate and execute necessary evaluations of the TtT-System. Scientists of the Universities Dresden, Alanus, Siegen and Rostock (Group 2) will support and counsel the core partners (Group 1).

Subordinated (to group 1), a commission for certification and measuring competencies will be founded (group 3). It deals with questions concerning admission to modules, learning projects and degrees or graduation (preparatory, basic co-

urses, Bachelor, Master, PhD) in the respective country. Depending on the region, group 3 can constitute of various partners. It can constitute of scientists and counsellors of companies and colleges as well as of representatives of administration. Another work group 4 is responsible for the design, execution and evaluation of the modules or learning projects. It constitutes of counsellors (of group 2) and scientists of the 4 African countries.

According to the explanations, the reader should bear in mind: this structure is a suggestion. It must be refined according to the conditions that are currently to be found.

The article presents a pragmatic outline. This could be helpful to establish and implement the TtT System but it needs further discussion and testing in the future.

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Session 2

Establishment of a VET system with focus on Further Education – presentation of ideas on the motivation and establishment of a Further Education system (FES), especially in universities in Sub-Sahara Africa.

While session 1 discusses the basics of VET and Further Education, session 2 deals with how to establish Further Education structures by presenting visions and ideas on their implementation and formation. Different approaches are analysed from a VET perspective to develop them for practical purposes. The focus is specifically on efforts from Sub-Saharan countries.

The session opens with a keynote on work-process oriented teaching and learning by **Ralph Dreher**. His article *TT-TVET in Sub-Sahara Area:A proposal for work-process-oriented Teacher Training in the field of Vocational Education and Training* is based on experiences in **German** VET.

The article by **Zhao Zhiqun** from **China**, *Construction of professional tasks-based Curriculum for applied Further Study Programme at Bachelor level – example Nursing Distance Education,*reports on an adult-education project in the field of nursing. The focus is on the design of the curriculum, the acquisition of competencies for teachers and aspects of self-regulated learning.

J. Kamwi Subasubani points out in his article *Situation and Development of VET and VET Science in Namibia* that **Namibia** faces similar challenges to many other countries in Sub-Saharan Africa. The competencies of many trainers are not sufficient to attain a high level of employability. The article proposes solutions for technical, pedagogical and didactical education.

Ewnetu Hailu Tamene's article *TVET-University Nexus: room for synergy* describes how TVET in **Ethiopia** can become the engine of development for the economy and labour market by networking with universities.

The presentation given by **Guiseppe Tacconi** and **Adula B. Hunde**, *Participatory research on teaching practice as basis for Teacher Education and networking between universities and VET schools* focuses on **Italy**. The authors asked: how can research on teaching practice become an effective way to educate teachers and build network between universities and schools.

In his study *The "three branch model" of Further Education of in-company vocational educators: Linking in-company learning projects, external training in Further Education and university learning,* **Nicolas Schrode** from **Germany** describes a training model that connects learning in companies, regional training centres and universities. The model was tested successfully and provides further impetus, in particular for the design of a flexible Further Education system for vocational educators in Sub-Saharan Africa.

The article of **Peter Kigwilu** from **Kenya**, *TVET Teacher Further Education: Practice, Experiences and Reflections of Stakeholders in Catholic Sponsored Community Colleges in East Africa*, studies teacher Further Education, focusing on transverse competencies like life skills, social skills and communication skills. Kigwilu explains why this profiling was important for the success of the Further Education programme.

Alpheas Shindi's article *Establishment of a VET-system with focus on Further Education – Presentation of idea*semphasises the centrality of **Namibia**'s own VET and Further Education system. Experiences from international partners may serve as references but the concepts should not be copied.

The study by **Winston Akala**, *The challenge of contextualization and domestication of VET reforms for higher education staff capacity in East Africa,* considers the current state of development in the wake of educational reforms in **Kenya**, **Uganda** and **Tanzania**. According to Akala, the gap between the economy and education still exists. Centres of innovation for technical and Vocational Education at universities could help to overcome existing deficiencies.

TT-TVET in Sub-Saharan Area: A proposal for work-process-oriented Teacher Training in the field of Vocational Education and Training

Ralph Dreher

Characteristics of modern Vocational Education

Work-Process-Orientation

Today, Work-Process-Orientation is the main characteristic of modern Vocational Education. That means that a typical work-process of a specific profession will be identified and used as didactical basis. Therefore, teachers of Vocational Education should be trained to use the methods of vocational science (often adapted by qualitative research methods of social science) to

- identify such work-processes (by using task-analysing) and
- understand the working-steps, use tools, diagnostic schemata etc. (by using the methods of work-process-analysis).

So teachers in the field of Vocational Education must not be only good engineers to understand the theoretical background, they also must be good experts in the gainful employment of their vocational field.

The model of the holistic Action

Using a typical work-Process as didactical base means also, to

- give the Vocational Education a structure of tasks (cf. the "development tasks" of Havighurst) as curriculum structure and
- use the whole "circle of action" as structure for a lesson unit (see fig. 1).

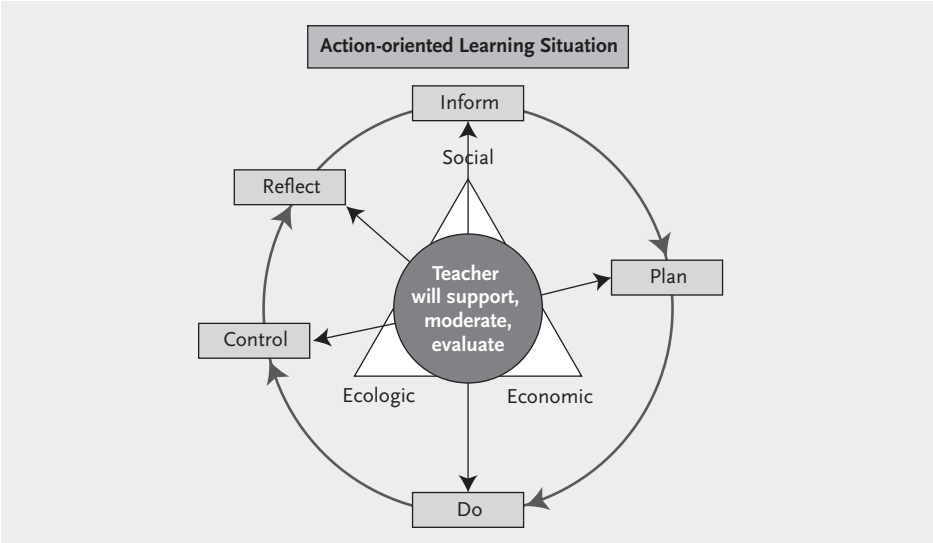

Fig. 1 Circle of Action

Looking at Fig. 1, the students are directly working in this circle, because it is their function during this process to

- understand the task (in the point of "inform")
- plan a solution by developing types of solutions and to choose their master-solution (during "inform" an "plan");
- realize their solution and to control the result (as part of "do" and "control") and
- reflect their result (in "reflection") by using questions like "What have we done why? With what kind of result?", "Why we have not seen this or that problem?", "How can we do it better next time?", "What have we done right and how can we adapt this to the next task?".

The main task of the teacher in this Learning-arrangement is not to be the leader of the learning-process. He is now the supporter of this process with the main functions to

- help students by giving them information material (or a chance to serve it from companies, internet etc.),
- moderate their work (often the students are working as team),
- give them a chance to realize their solution (by conditioning a workshop for using by the students) and
- moderate their process of reflecting.

"Competence of Design" as main task of Vocational Education

Looking to the sketched idea above, that students for themselves are steering their process of learning by developing a solution for a profession-typical task AND

the teacher is supporting them, vocational training can become a complete other function. It is not longer the leading idea, that vocational training is main focussed to a "drill and skill"-Training for preparing directly for gainful work, it is also now a process of EDUCATION, because during the students work in the circle of action, they learned a lot about

- information-handling, the real value of an information for the work and the danger of misinformation's;
- working and discussing together and accepting other opinions during their teamwork;
- understanding, that more solutions are possible and the first solution in most cases are not the perfect solution;
- accepting failure and the value of failure for the own process of development;
- themselves and their views to the others and in the same moment the view of the others to themselves during the process of reflection.

All these qualifications together can be understand as parts of a "Competence of Design", what means: The person, which is able to

- understand problems (and to difference between important and unimportant problems),
- find – together with others – concrete solutions,
- to realize a solution and
- reflect and to optimize this solution

and which is also able, to design their life by developing their world of labour AND their personal world. So Vocational Education with the main topic in "Developing a design-oriented competence" becomes the effect not only to train for gainful employment, it is also acting in the field of developing personal views, personal action regulation and self and foreign perception. So all these requirements are playing an active role in designing the personal future with sturdily and balanced relationships between myself, my family and friends and my desire for possession. And back to my labour: During my work with my personal possibilities it becomes possible for me, to work for the future of the industry and their products, the future of necessary services and in sum: Becoming a small, but imperative part in the process of growing up a powerful national economy with a friendly society.

By looking to the idea of developing such a "Competence of design" as main topic of a process of Vocational Education, it is very important to understand, that the last step of reflection is the most fruitful phase for this topic.

Consequences for the Teacher-Training

Characteristics of good teacher-work

To realize the idea above by using vocational training as base for a general education, it is the main topic that Teachers for Vocational *Education* Training (TVET) will be trained for planning, making and reflecting such teaching-units or courses.

And the first step to develop such a teacher-education means to have a look to successful teachers and how they will manage their work-process during the steps of creating their lessons, units and courses.

To concrete this idea as preparation for the development of a Teacher-Training for TVET (TT-TVET), the TVD (Institute of Technical Vocational Didactics, www.tvd-edu.com) at the University of Siegen has analysed in a further project especially in the sector of Automotive Service, that eight characteristics are typical for excellent TVET-Work in the field of Vocational Education (see Tab. 1):

Tab. 1 Eight characteristics of good "Automotive Teachers" and their effects (Dreher 2011)

<table>
<tr><th colspan="2" rowspan="2">"Automotive Sector"</th><th colspan="4">Teacher training</th></tr>
<tr><th>Goals</th><th colspan="3">Effect</th></tr>
<tr><td>1</td><td>Practice- and work-oriented without organizational blindness/myopia</td><td rowspan="2">Definition of tasks:
Find realistic working tasks</td><td colspan="2" rowspan="3">Innovating</td><td rowspan="6">Educating</td></tr>
<tr><td>2</td><td>Organize (vocationally scientific-oriented) analyses of work-processes</td></tr>
<tr><td>3</td><td>Working didactically synthesizing (instead of reducing)</td><td rowspan="2">Development of tasks:
Define workable and internally differentiated working tasks</td></tr>
<tr><td>4</td><td>Designing failure-based tasks in keeping with the learner</td><td colspan="2" rowspan="3">Teaching

Assessing</td><td rowspan="4">Advising</td></tr>
<tr><td>5</td><td>Preparation of teaching-units down to the last detail</td><td rowspan="3">Implementation:
Offer coaching for the students;
Allow for mistakes and moderate internal reviews of the students groups, offer technical and manual assistance;
moderate internal and external processes of reflection</td></tr>
<tr><td>6</td><td>Comparative reflection of work-planning and its degree of implementation</td></tr>
<tr><td>7</td><td>Acceptance of the role of a coach who works emphatically and encourages the gaining of knowledge</td></tr>
<tr><td>8</td><td>Being open towards the constant further development of one's own classes</td><td>Reflection of teaching-units:
Work out possibilities for improvement of the lecture plan and execution</td><td>Innovating</td><td colspan="2">CEPI – Continuous Education Process Improvement</td></tr>
</table>

Looking at Table 1, the results of this survey can be listed by using the five general effects remarking teacher-work:

- Teaching,
- educating,
- advising,
- innovating,
- improving (continually – CEPI).

General conclusions for an aim-oriented Teacher-Training

As general conclusion of the defined characteristics of teacher-work in Table 1 can be formulated, that Teacher-Training especially in the field of Vocational Education must adapt to the model of the complete circle of action (Fig. 1). Because an

excellent TVET is not only a good teacher or educator, he is also a well working adviser, who is continually working by using reflection as base for improving and innovating their work with the students. So TVET also must understand their work as unit of informing (and using further results of reflection), planning, doing, controlling and reflecting. This result is in harmony with the following general statements about modern Teacher-Training:

- "Teachers must learn to teach through doing." (Mayr 2006)
- "Teachers work requires implied knowledge, generated by experience." (Neuweg 2002)
- "Teacher-education must integrate practical periods". (Oser 2003)
- "Place in the center of TVET teacher studies the analysis, design and evaluation of (a) vocational learning, educational and qualification processes, (b) occupational work and processes and (c)technology as an object of work and learning processes [...]" (Bandung-Declaration 2008)
- "The way this works – between both opposite poles of a pure take-over of existing practice or as a creative, constructive development of educational practice reverting to training experiences – is related to the kind of training and its effects." (Terhart 2002)

Trying to formulate a synopsis of all these ideas above, how excellent Teacher-Working can established, five facts for TT-TVET can derive:

1. Teachers will be formed through their own learning biography whereby they get their own teaching style.
2. Even university teacher education must follow the paradigm of promotion of design-competence, work process orientation and identify through relevant seminar presentation.
3. Academic teacher education needs working-tasks from teacher business, which can be solved and reflected by using scientific methods.

And as consequence of this synopsis, TT-TVET can be organized by using the following rules:

4. The definition of the special working-tasks can be realized by using the methods of "vocational science" (Rauner et.al.) and must be formulated as development tasks. That means, that every task shows a problem inside the work-process of TVET and that the teachers will develop their own personality during finding a solution.
5. The development of a curriculum for TT-TVET can use the idea of a competence-oriented taxonomy like the novice-expert-model created by Dreyfus/Dreyfus. Looking to this model, the Training of TVET will start with simple tasks with a clear problem and well creating solution. But the tasks will become more and more indifferent (combination of problems, new problems without formulated solutions), so that a personal (!) solution in harmony with the experience of the teacher and his personality will be the solution.

Examples

Example I: (Re-)Training-Concept for Teacher in the field "Automotive Service" (TVD)

Up to 2008, a main task of TVD (further established at University of Wuppertal) is, to develop TT-TVET special for teachers coming outside the central Europe system (www.tvd-edu.com).

That means, that the training must be focussed on the idea of action-oriented learning as requirement for real Vocational Education by initialising the development of design competence. To understand the relationship between this three terms, TVD has developed a two-step-introduction:

First step

The TVET are working in the role of students. They try to find a simple failure. As example: Car will not run, because the fuse for the fuel pump is damage. Discussing about a diagnostic-scheme, they understand, that the main solution will be to create a diagnostic-scheme, which is closer look as logical: A combustion engine (no Diesel) needs air, electric energy, fuel, a working ignition-system and compression pressure to run. Now they must find the main question: What is simple to check, what is difficult: Checking the airfilter and the electrical power is simple (switching the starter), it is also simple to check the fuel pump (looking to the in most cases transparent fuel supply lines). Next step of complication is to check the fuses for the CPU, the Anti-Theft-System and the fuel pump (in case of non-transparent fuel supply-lines). And it is complicate, to check the ignition-system (using special tools, knowing about the danger) and the compression pressure (directly with a compression tester or indirectly looking to the current consumption by using an oscilloscope – also using special tools plus time for remounting and mounting). So the solution may be in details different – but the master-solution has the same structure as described above. That must be a cognisance in the part of the reflection, when the groups of TVET in this session compare their results. In these moments, they understand the didactical concept working with solution open vocational tasks as base-element of the lesson-units. Also, they understand the function of a self-directed informing and planning and the necessary of the part of reflection.

Second Step

As second step, the TT-TVET-Concept of TVD gives the teachers the possibility to develop their own lesson unit with a specific topic – that means a specific work-oriented vocational task in the sector of "automotive service".

To give teachers the possibility to understand at first the general concept of creating such lesson-units and then to adapt this general knowledge for lesson-units with complex vocational work-tasks, TVD has designed the following steps of general working tasks (like a taxonomy of vocational oriented-tasks in the field of automotive service):

Tab. 2 Modules of TT-TVET for the vocational sector "Automotive Service"

TT-TVET Module	Planning lectures for one of following work-tasks:
Automotive Service	Inspection, exhaust-gas test, control of brake-system and steering-system, change of fluids
Abrasion Repairs	Repair of brake and clutch, renew axle mounting and steering knuckle, renew exhaust pipe
Repair of Engine Mechanic	Failure diagnostic and based on it a valve seat overhaul, renewal of main and connecting rod small end bearing, cylinder measurement and insertion of oversized piston
Repair of Gear Box	Renewal of synchromesh mechanisms; renewal of brake band, multi-plate clutches and free-wheel feature, checking of control valve for module/control pressure, overhaul of power lock differential
Repair of electrical circuits	Fix defects in the lightning set or power supply (generator/alternator battery)
Repair of Control Technology	Failure diagnostic and removal at the engine management, the driving dynamics control and the comfort functions

Example II: Curriculum for Engineering-Education (IPW)

The "Ingenieurpädagogische Wissenschaftsgesellschaft (IPW)" is a German association of engineering educators and was founded in 2012 (www-ipw-edu.org).

The general aim of the society is to establish a module-oriented education for academic teachers in the field of engineering.

The main topic of the IPW can describe as theory-practice-combination, what means: The modules will at first give an overview about special concepts (like laboratory didactics) for teaching engineering science or tasks of teaching (like the development of scientific writing in the field of engineering science). After this, the participants of such a module will use this theory to solve a task of planning, teaching, educating or reflecting. (See Fig. 2):

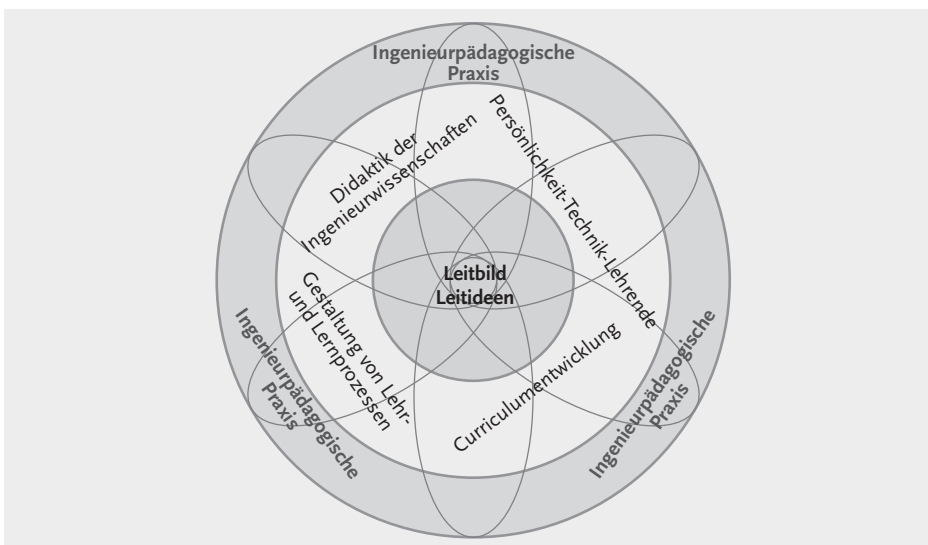

Fig. 2 Structure of the IPW-Curriculum (IPW 2015)

A special remark of this curriculum can be describe as "model-orientation": Because the IPW-Curriculum is working with the main criteria of sustainability as general aim of education for technicians. That means that in this meaning all kind of technicians will have a strong possibility to design our world. Technicians are still working to solve the problems of clean water, food, energy, and education for all by building up special technical solutions like photovoltaic-fields, simple-working WIFI-networks and so on. But they also decide, what kind of materials they use for their projects – like the "rare earth" for the electronic communication devices without a chance of recycling. So engineers and technicians must learn to get an overview about the social results of their work and the decisions during their work. That is the main educational remark of the IPW-Curriculum – with the general question: How can I as educator integrate this part of education in my lesson-planning, my working with the class and my personal reflection of my educational processes.

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Construction of Professional Tasks Based Curriculum for Applied Further Study Programme at Bachelor Level – take Nursing Distance Education as an example

Zhiqun Zhao
Baozhi Sun

Abstract

This paper describes a curriculum reform project in continuing education programme at undergraduate level to the in-service nurses by means of distance learning in China. Based on the concept of typical professional tasks from Vocational Education, the project aims to cater for the needs and features of adults' learning. Result shows that students enhanced their professional competence through solving the professional tasks during the study. Difficulties in implementation of the new curriculum are capability and experience defect of teachers, low motivation of some students and the acceptance of the curriculum concept by the traditional academic (not professional) community.

Keywords

Continuing education, distance learning, professional tasks, curriculum reform, undergraduate programme in Further Education.

Background of the Reform Project

Since 2000, with the introduction of distance learning technology in higher education, an applied further study programme at bachelor level has been conducted by the School of Distance Learning for Medication Education, Peking University (referred as "PUDM"). The students of this programme are on-the-job nurses

with associate college degree (zhuan ke). Initially, PUDM adopted the traditional curriculum mode of nursing education which is prevailing in most Chinese universities, e.g. independent two systems for teaching of theory and skill training. Among them, the theory courses are divided into general courses, basic specialized courses and specialized courses. The features of this curriculum are: (1) emphasis on completeness and systematics of disciplines and focus on reproduction, understanding, verification and memorizing of knowledge; (2) the content of theoretical learning is the result of didactical reduction which without direct connection with work; (3) the practical teaching emphasizes on operational techniques and skills, and there is a lack of learning and reflexing in real work process (Zhao, 2014, p. 192). Problems were proved in the practice of implementing this curriculum: (1) the learning content didn't link directly to real work content; (2) this mode of education didn't go hand in hand with students' future daily work; and (3) their practical capabilities failed to be recognized by their employers at last.

In 2010, PUDM envisioned to construct a more practical and more convenient mode of teaching and learning which caters for distance learning. In partnership with the Institute of Vocational and Adult Education of the Beijing Normal University (BNU), the PUDM initiated a curriculum reform project oriented to the new development of the health care industry according to the traits of adults' part-time learning on the Internet. A scheme of professional competence development from Vocational Education was introduced based on the concept of typical professional tasks (Kleiner et al., 2002). The project aims to find a solution to the questions: how to cater for the needs and features of adults' learning, and how to make use of technological edges of distance learning to improve their holistic professional competence.

Guiding Principles

Compared with students in full-time study programme, adult students in part-time study programme have the traits of utilitarianism-oriented learning motivation, clear self-identification, learning readiness being related to their social roles (Knowles, 1990). Their learning activities are oriented to problem solving in practice rather than for theory study and research. According to the reform concept, the new curriculum should focus on the training objectives of holistic professional competence development, comply with the relevant development rules of professional competence (Dreyfus and Dreyfus, 1986; Rauner, 1999) and establish a course system based on typical professional tasks (Kleiner et al., 2002, p. 23). Emphasis of the new courses is laid on the work process, working content, working conditions and work requirements of the nursing practice (Reinhold et al., 2003). The learning content highlights students' self-directed learning which is based on "Working-learning tasks" and online learning resources. Meanwhile, students can be tutored in their daily practice both by experienced nurses and university teachers. The teaching assessment is based on the assessment content and methods on nursing practice in the clinic.

Process of the Curriculum Development

Conducting Survey and Identifying the Roadmap of the Reform Activities

During 2011−2012, the project group conducted a one-year survey to identify the basic principles and cultivation objectives of the new study programme. (1) According to the literature study and policy analysis, the health care policies and their development orientation became clear. The curriculum reform should be based on work place and work process requirements, meet the national education policies and the development trend of the health care industry. (2) Nurses' professional practice needs holistic capabilities. The objectives of nursing education are to help students acquire the holistic competence for the nursing career, which shall be set as the quality standard of education. (3) According to the survey on work place needs, the fundamental requirements for nursing job are identified. (4) It is needed to collect the information about the current situation of nursing education in China and abroad as well as about the different experience of competence-based curriculum development in Vocational Education and training.

Adopting Suitable Approaches to Identify the Curriculum System

Usually, there are two distinct guiding principles in curriculum design, thereby formed two different course schemes. One is based on the discipline system which focused on its scientificness, completeness and systematicness; the other is based on occupational requirements and focused on the application of knowledge, which lays an emphasis on the requirements of work place. The former faces at least the following problems which are hardly to solve: (1) without treating 'work' as an entity, the corresponding work experience cannot be obtained; (2) teaching-learning process focuses on the knowledge infusing and training of skills while neglecting the values of discovery learning and action learning, so that in the end lead to the highest level of professional cognitive competence cannot be developed; (3) students are facing extreme difficulty in theoretical learning which far away from the work situation and also cannot realize implement the knowledge transfer (Zhao, 2014, p. 192). In general, this mode has been ruled out because it goes against the objective of the curriculum reform in this project.

PUDM has analyzed the work-based curriculum development approach and holds that it is of great importance to the nursing career development (Benner, Tanner and Chesla, 1996; Rauner, 1999). Therefore, the "Professional Tasks Analysis Approach" (translated from Berufliche Aufgaben in German language) has been chosen, whose key lies in the Expert Worker Workshop (EXWOWO) on clinic practice (Klein et al., 2002, p. 20−34).

On January 17th 2013, the PUDM held an Expert Worker Workshop on Clinic Practice. The attendees conducted an analysis about nursing professional tasks. Under the moderator's guidance, experts recalled their history of career development and be categorized several stages (Zhao, 2009). They identified challenging tasks at every various stages and then they classified and named those tasks. Fi-

nally they summarized a framework of 13 professional task for nursing profession (at the bachelor's level), i.e. career awareness, primary clinical nursing, clinical assessment, nursing for common diseases, emergency and intensive nursing, emergency response inside and outside hospital, difficult and complex nursing problems disposal, nursing teaching, organization and management of nursing effort, nursing administration, the doctor-patient relationship coordination, nursing research and monitoring nursing quality. All above lay a basis on the classification and index of study courses at the bachelor level (Xia, Sun and Liu, 2014).

Setting up the Curriculum System, Internal and External Review of the Curriculum

On April 7th 2013, PUDM invited the experts who attended the EXWOWO to finally identify and review the names and content of the identified professional tasks, basically confirmed the curriculum framework of nursing education. Afterwards, the new curriculum was submitted to an external expert commission. They reached a consensus on the reform thought, the procedure and reasonable results of the construction of the curriculum system. They made also comments on the coverage and difficulty of different courses, qualification needs of teaching staff and feasibility of the new curriculum. They suggested that the new curriculum should be tested by a pilot programme firstly.

Perfecting the Curriculum and Determining Operation Teaching Plan

The project group invited clinic experts to further streamline the new scheme and analyze the content of the professional tasks. They discussed every task's background, significance, working process and content, and finally confirmed the teaching plan. In the meantime, the group members consulted experts from other universities and education research institutions and solicited advice on course design, teaching methodology, assessment mode. Meanwhile, all colleagues of the project group drew up a detailed teaching plan on the course "Coordinate the Nurse-Patient Relationship and Tackle Disputes" together as a model for other courses.

The features of the new curriculum can be summarized as: (1) the objective is development of holistic professional competence, where students can obtain the professional cognitive competence, occupation skills and qualification; (2) the learning content is the professional task, which is not (direct) corresponding with discipline knowledge; (3) the learning process is equipped with the work process, where students can conduct learning and thinking in comprehensive actions. Starting from the world of work, the new curriculum helps students to deeply understand the connection between knowledge and work, obtain the work process knowledge and context awareness (Fischer, 2000), it could realize an unification of action, perception and emotion and the return of curriculum from the world of science back to the world of work (Zhao, 2014). From the perspective of learning

theory, new curriculum is based on the theory of constructivism, situated learning and action orientation.

Development of Learning Resources and Teaching Support Environment

Distance education must be supported by online learning platforms. Based on the new curriculum philosophy, big changes take place in the development mode of course resources. The new support platform contributes to teaching design, resource design and learning process, e.g. it adds functions like monitoring when students hand in their homework, determining the proportion of test modes and real-time statistics of Q & A (Wang, 2011). Various departments can share information and coordinate on following up learning process and assessment.

Pilot on the experiment class and continual improvement

The new curriculum was implemented in a small scale firstly. In 2013, a pilot class was set up. Candidates volunteered to apply for the pilot class. They shall be on-the-job nurses who equipped with associate college diplomas of nursing and nurse practitioner certificates. They should be ready for the teaching reform and intensive learning. The pilot class enrolled 32 students in 2013 and 62 in 2014 respectively. The following measures were adopted: (1) elaborating design on the teaching process; (2) choosing qualified teachers, ensuring them to understand the teaching-learning reform concept and master the latest instruction methods; (3) enhancing support and tutoring for students, paying special attention to students' individual differences.

Before the new semester began, the PUDM convened all the teachers to discuss the design of courses and hold meetings of preparing teaching plans, so as to make an effort to ensure the teaching reform. During learning processes, the project group timely followed up the teaching to monitor to spur students' learning. At the end of a semester, the PUDM teachers made summary and reflected their teaching activities. The results show that students have finished learning tasks and enhanced their capability of knowledge acquisition. But they had also difficulties to adapt to the new teaching approach, during the first year. That phenomenon requires more guidance for teachers.

Result and Discussion

The implementation of the new curriculum is not long, the whole effect needs to be comprehensively evaluated. According to tracking survey, as a result of the way of action-oriented approach to learn in real work situation, students have to collect data, make and implement a work plan and evaluate the learning outcome by themselves after get work and learning tasks form teachers. Compared with traditional discipline-based curriculum, students participate in the real work process deeply and solve the complex professional issues, rather than just reading text-

books and discussing about some cases, which plays a positive role in promoting the professional action competence. Random monitoring on a typical day of students' online learning shows that, compared with those from "normal" classes, students from the pilot class have more participation in learning. Most of them study online during 20:00−23:00 and some still do even at 24:00 o'clock. According to the feedback about the first group of graduates, the reformed study programme has been welcomed by employers. Since the good performance and the reputation of graduates, for example, a famous Sino-foreign joint venture upscale hospital from Shanghai even proposes to cultivate a large number of their nurses in cooperation with PUDM.

Our survey found that the competence of teachers is a key factor to the quality of the implementation of the new curriculum. On the one hand, teachers should have the sufficient didactical-methodological competence, can design suitable learning tasks to reflect the real work requirements; on the other hand, the teachers' working experience have a great impact on the study of students, the degree of professionalization of the guide teachers provide directly affect the depth and breadth of student reflection about the practice. It's still difficult to find enough competent teachers.

In the new curriculum, self-directed, (relatively) independent and out-put-oriented learning approach requires that students use expertise and work experience to solve practical problems. This increases learning pressure for some students who have less learning motivation and just want to get diploma. Several students are no longer willing to pay so much to learn after a period of study, who ask to resign from the pilot class and return to learn in the traditional "normal" classroom.

The reform calls for the breakdown of the traditional curriculum mode and the establishment of a new curriculum concept, it is challenged also by two things: (1) there is a great change in the curriculum concept and philosophy of study administration, study service and instruction before and after the implementation of the reform project. All the participants shall change their mind-set, which faced great problems in the practice; (2) facing query from (part-time) lectures, external experts (e.g. professors from traditional scientific disciplines) and students, who needs a lot of explanations.

Practice shows that timely summary is an effective approach for continuous improvement. At the end of every stage of study, teachers shall be convened to summarize and exchange their views on the teaching activities, and seek for further improvement approaches.

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Situation and Development of Vocational Education and Training (VET) and VET Science in Namibia

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Abstract

Ever since independence, Namibia has invested heavily in Education and Training. However, the Education and Training system has remained weak by international standards, and therefore requires significant interventions of which teacher/VET Trainer is central. The provision of Vocational Education and Training (VET) is a challenge, worsened by the inaccurate perception that VET is second-rate alternative to a purely academic education. Thus, there is an urgent need to raise the quality of VET in order to improve the quality of VET graduates who are skilled, employable and ready to contribute to the development agenda. The NTA has identified the major factors that prevents VET from fulfilling its mandate in the developmental agenda, leading to decisive measures been taken, such as: improving the VET Curricula, availing up-to-date training equipment and materials, and most importantly the Training of Trainers (ToT). Different studies have been conducted to establish the competency levels of VET Trainers, and results shown major deficiencies that requires an urgent need for up-skilling and capacity building of trainers. The need to up-skill and capacitate VET trainers has resulted in a ToT system being developed. Immediate actions have been taken and cooperation with support initiatives have been strengthened. The major problem faced by NTA is the development of a sustainable Education and Training system including technical, pedagogical and workplace (industry) exposure of VET trainers. Best practice models have to be established which show strengths, weaknesses and opportunities of the approach.

The objectives of this paper are to explain the current the VET trainer education and training system and to present the ToT system challenges on the way to a full-fledged nationwide system.

Introduction

The lack of a high skilled workforce has been identified as one of the most problematic factors for doing business in Namibia as a result of an educational system in regards to Higher Education and training that is ranked 118 out of 148 countries.[1] These reports are showing an urgent need to raise the quality of vocational training and education and supports the approach of the government to put their focus on this area. The Vocational Education and Training (VET) Act, Act 1 of 2008, mandates the NTA to achieve an effective and sustainable system of skills formation and establish a stable organisation and management system for Vocational Education and Training. The NTA through its Strategic Plan for the period 2015/16 – 2019/20 aims to be the national port of call for Vocational Education and Training skills. Therefore NTA is responsible to regulate and facilitate the sustainable delivery of quality Vocational Education and Training to the benefit of their stakeholders.

There are six key focus areas identified which will drive the Strategic Plan over the next five years towards the realisation of specific and defined strategic objectives:

- Organisational Effectiveness
- Funding
- Regulation
- Training and Related Services Provision
- Administration of the VET Levy
- Stakeholder Engagement and Communication

This document aims at providing a short overview about the response to objective of up-skilling TVET Trainers, commencing with a situational analysis, brief overview of interventions that the NTA had undertaken, and continues to implement, in addressing the competence levels of trainers.

Situational analysis

The results of the 2015 Competence Assessment report, the average competency (pass) rate among VTC trainees and the real or perceived un-employability of public VTCs graduates among other indicators call for an urgent need for Continuous Professional Development (CPD) and the capacity building for VET trainers. The Competence Assessment specifically identified the lack of rightly qualified, skilled and up-to-date VET trainers and thus called for increased investment in the pre/in-service training for all VET Trainers. The above predicament is a result of a number of issues such as the absence of institutions in the country for further technical training beyond the current VET Certificate (Level 3) offered in Vocational Training Centres across the country. Furthermore, limited access to institutions of higher learning that offer VET specific pedagogy and didactics to quali-

1 The Global Competitiveness Report 2013–2014, p. 291.

fied artisans, technicians and engineers who wish to become VET Trainers. Lastly, a limited and outdated industry exposure by in-service VET Trainers, as a result of a less effective relationship between industry and training drastically affect the quality of VET Trainers. In short, Namibia, currently does not have a properly established and integrated education and training system for VET Trainers. In the absence of an established system, what the country has is a fragmented system that sees VTCs, NUST and Industry operate in isolation towards the development of VET Trainers.

Currently Vocational Education and Training (VET) in particular is provided by a wide range of providers:

- Public Vocational Education and Training centres (VTCs)
- Private Vocational Training Providers
- Commercial companies
- Workplace related providers
- Ministries
- State Owned Enterprises (NAMWATER, NAMPOWER)
- NGOs

For the purpose of this paper, focus will be placed on six public VTCs that fall under the direct control of the NTA in terms of funding and management. There are about 151 VET Trainers in these public VTCs.

The Human Resource Department of the NTA indicates the minimum standards of VET Trainer requirements and differentiate them into:

- Pedagogical Qualification: a minimum National Certificate Vocational Education and Training: Trainer (Level 4) or equivalent or comparable qualification. Where the above qualification is not available, a minimum of 5 consecutive years working experience in the specific occupation/trade area with a focus on the areas where training will be offered.
- Technical Qualification: Qualification must be one NQF level higher than the level at which training will be facilitated. It would be advisable to have trainers having a minimum of NQF Level 4 Qualification where applicable.
- Experience: A minimum of three years practical experience within the scope of the discipline in which the training will be offered.

All in all the technical and pedagogical competence of VTC trainers is crucial to the successful implementation of any VET strategy. The NTA tries, therefore, to make concerted efforts, not only to train, but also to re-train those trainers who are in the system.

TOT systematic Approach (TOT Interventions)

Still in the phase of researching and planning, NTA is not waiting for the planning cycle to be completed before embarking on implementation. Aspects such as increasing trainee enrolments; improving trainee outputs; improving the quality of

VET provision; strengthening training providers; revising curricula; and improving skills of trainers, amongst others are proceeded regardless of the planning process. In addition, there is a pressing need for the NTA to expand the provision of VET in the immediate short-term and visibly seen to be making a difference on the ground. Public expectations are high and must be addressed sooner rather than later. The short-term process concludes the effective use of support initiatives, while simultaneously progressing with the development of a TOT system.

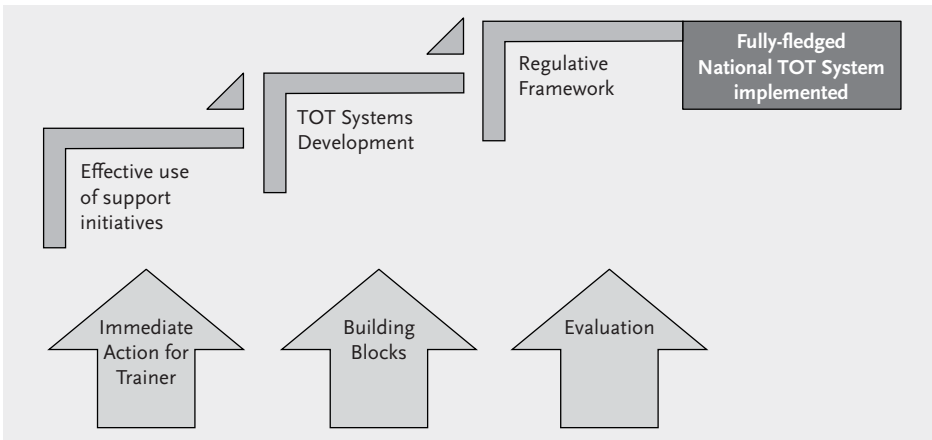

Fig. 1 Namibia TOT System Development Approach

Regarding the alignment of demand and supply based on the Human Resource Development Plan, the NDP4 points out specific strategies which lead the way in developing a TOT-system. The TOT System Development Approach building up on following components:

- Increasing the provision of opportunities for VET and technical education
- Introducing competency-based education and training (CBET)
- Upgrading educator qualifications
- Providing adequate equipment and infrastructure for VET centres

MAIN ISSUES

Developing a systematic approach for the TOT and a continuous development of in-service trainer is in the beginning. There are a lot of issues NTA has to address to, the main issues which are highlighted in the following.

VET Trainer Standards

The problem is that the foundation of the pre-service training is already insufficient due to the challenges faced by the current VET system. As a result, the quality of VET Trainers when entering the system is less desirable, thus requiring an effective TOT system to retrain those trainers. It is therefore impeccable to either raise the entire standard of VET sector and strives for excellence from the beginning or TOT will always be a step behind.

Technical up skilling

The capacity building process for VTC trainers always consists of a pedagogical side and technical side. But following an old saying in *"it's easier to teach a plumber to teach than a teacher to do plumbing,* the main focus should be on technical up-skilling of trainers. Trainers in Namibia ought to be one level higher than what they teach. Therefore it seems to be enough to just upgrade trainers to Level 4, 5 or 6. One problem is that level 4 till 6 enhances no further technical input and is concentrating more on management topics. The crucial problem is that most trainers lack the appropriate technical skills, as the highest Level 3 they attained is the equivalent to the one they teach. Therefore, the CPD Unit has come up with technical up skilling initiatives such as 6−8 weeks short courses where trainers go on contact sessions at schools of higher learning. In the pipeline is the idea to have technical up-skilling held at local VTCs, where experts are brought in to teach the VET trainers?

Pedagogy didactic training

The need for pedagogy and didactic training cannot be overemphasized, because delivery methods of lessons are as critical as the level of knowledge of the subject the VET Trainer has. And, in this case, there are no technical colleges that offer a combination of technical and pedagogical training to pre-service VET Trainers. Therefore, leading to a situation where upon recruitment as VET Trainers, the trainers are technically equipped, but lack the philosophies that involve skills and knowledge transfer. In this regard, the CPD Unit facilitates the partnership between NTA and NUST where pre and in-service trainers undergo a VET Trainer (Pedagogy) training at NUST.

Industry Exposure/Work based training

For meeting industry requirements and standards, training has to keep up with technological change and close ties to industry have to be maintained. Yet public training providers have not been able to sufficiently adapt their services to changes in occupational profiles. The attitudes and qualifications of trainers are often weak and outdated and most trainers lack practical experience. Industry exposure or work based training is a significant element of artisan training programmes at Level 2 and above. Still presently placements are not arranged for a significant number of trainers and trainees currently in the system. The reality in the VET sector shows that work placements are rare and that the quality of the work placement is often low. Particularly rural VTCs struggle with a lack of industry connection as the density of industrial activity is obviously low in these areas. The process of arranging industry attachment for trainees has already been started and will be included in the new qualification ProVET has been working on. As of 2016, the CPD Unit has established partnership with the Namibia Chamber of Commerce and Industry (NCCI) to introduce the concept of Industry Exposure for VET Trainers.

Food for thought

How should a trainer qualification look like?
How can pre-service trainer be better educated?
What is the careers path of a VET trainer?
How can we expose trainer to industry?
Is didactics training the most for now?
How can we strengthen the relationship between industry and public VTCs?
Is another level system necessary for VET Trainers with a Level 3 technical qualification?
Where do we find trainers who are able to retrain in-service trainer?

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In-service teacher training for VET institutions: the challenge of evaluation in Comunitat Valenciana (Spain)

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Abstract

Like other European countries, in Spain, a coherent and systematic process encompassing pre-service education and professional development for VET teachers is still in progress. However, in-service teacher training is a key priority in the agenda to support teacher competencies and to enhance the quality of teaching and learning. But to prove the outcomes of teacher training and to improve professional development programmes, it is necessary to evaluate this training.

The aim of this paper is to present some reflection from practice, on the evaluation of in-service VET teacher training in a region of Spain, Comunitat Valenciana. The article focuses on the evaluation characteristics that appear to be more related to the impact of teacher training on the improvement of teaching processes and results: training needs analysis, evaluation of learning, and its transfer.

In this region, in-service training for VET teachers is a complex system, with three main stakeholders: a) the central, public agency in charge of the Annual Plan for teacher training and certification; b) VET schools, with certain level of autonomy; c) and the Centre for Training, Innovation and Educational Resources (CEFIRE), which is responsible for: training needs analysis; enhancing innovation and research in schools; and evaluating schools' training programmes.

In 2014, members of CEFIRE started a peer learning process to design an integrative evaluation plan for VET teacher training. In this paper, the actual situation of evaluation, as well as the new proposals, are presented and discussed considering current literature and empirical studies on teacher training quality and impact. The results of this learning process constitute the baseline to further develop and im-

plement a coherent evaluation framework for teacher training, and hopefully they can contribute to the discussion on evaluation strategies for similar institutions.

Introduction

In any VET reform or implementation of new policies, the role of VET teachers and their professional development is crucial. Policymakers often expect VET systems to fulfil high and broad expectations, such as meeting industry's skills demand, improving youth employment rates (European Commission, 2015), modernise and industrialise national economies (Grossmann & Naanda, 2006). The role of teachers has become more complex and there is a growing awareness of the teaching profession, as VET institutions respond to change -whether it is a complex reform or the adaptation to changing economic or social conditions- largely depends on teachers' preparation (Buck, 2005).

Within this complexity, pre-service teacher training is not sufficient in order to meet all demands from the labour market, students, policies and changing context. In-service training can be a form of capacity building for VET institutions and a support for VET teachers, as an opportunity to deepen their understanding of their own disciplines; to improve their pedagogical knowledge and strategies; and to help them integrating ICTs in their teaching process (NTA, 2014).

But still, to establish the relationship between in-service teacher training and the enhancing of quality of teaching and overall, of VET institutions, it is necessary to evaluate this training and its effect on teachers' practice. Given the public investment in teacher training, it is also a matter of accountability and transparency of public efforts to inquire on teachers' learning outcomes.

For this reason, some reflections on the evaluation of in-service teacher training in a region of Spain, Comunitat Valenciana, are presented. The paper focuses on the evaluation characteristics that appear to be more related to the impact of teacher training on the improvement of teaching processes and results, which is one of the priority in evaluation to the Valencian educational authority (Orden 65/2012): training needs analysis, evaluation of learning, and its transfer.

Context: in-service training system for VET teachers

Like many other European countries (European Commission, 2010), in Spain, it is currently premature to refer to a VET teacher education and training system since a coherent and systematic process encompassing pre-service training and professional development has not been implemented yet.

However, supporting teacher competencies is a key priority in the agenda. Spanish Ministry of Education (Ministerio de Educación, Cultura y Deporte, 2015) firmly states that initial and Further Education of teachers is one of the main tools to enhance the quality of teaching and learning. A breakthrough in teacher training

system is recommended, as well as a rigorous evaluation of the outcomes of in-service teacher training on academic achievements of students.

In Spain, VET teachers are civil servants, who have to pass a State exam to be employed. As far as their pre-service training, VET teachers have usually a vocational qualification, a variable amount of work experience and a teaching qualification. The formal requirements to become a VET teacher are getting more and more precise regarding the pedagogical qualification; nowadays, to become VET teachers, graduates need to specialise through a master programme. However, for other kinds of VET educators, such as in-company trainers who act as tutors for students in their apprenticeship, there are no national formal requirements or qualification standards. This is a common situation in European countries where VET systems are not based on dual training principle (Keurulainen, 2014). Nonetheless, as long as work-based training and apprenticeship contracts have been implemented (since the law Real Decreto 1529/2012), the role of in-company tutors and trainers in VET dual system is currently an active debate for researchers and practitioners (Bertelsmann, 2015).

Regarding in-service training, it is considered to be a right and an obligation of every teacher (Ley Orgánica 2/2006), and it is in the jurisdiction of the decentralised education authorities in each of the 17 autonomous communities. Comunitat Valenciana is one of these autonomous communities with 323 VET schools and around 86,000 VET students attending (51.3 % at middle-level vocational schooling and 48.7 % at the upper level) (Ministerio de Educación, Cultura y Deporte, 2016, data 2013−14). The Gross Enrolment Ratio is 48.1 % for middle-level VET, and 45.9 % for upper level − both are 9 % higher that the Spanish national GER for the same educational levels −. 3,263 VET teachers were enrolled for the academic year 2013−2014 (without considering teachers of art and sports disciplines).

In Comunitat Valenciana, in-service training for VET teachers is a complex system, with three main stakeholders: a) Teacher Training Service, a central and public agency in charge of the Annual Plan for teacher training as well as its evaluation and certification; b) VET schools, which have certain autonomy and design their own Annual Training Programme, led by a teacher which has the role of "school's training coordinator"; and c) The Centre for Training, Innovation and Educational Resources (CEFIRE), specific for VET institutions. This centre is responsible for: conducting training needs analysis; enhancing innovation and research in schools, by promoting networking and inter-schools training activities; and evaluating schools' training programmes. CEFIRE acts as a mediator between education authorities and schools: CEFIRE advisors, who are typically specialised in some of the 25 vocational sectors, work in close cooperation with schools' training coordinators and leaders.

Reflection from practice: the evaluation of in-service teacher training

This paper is an outcome of a reflective learning process conducted from November 2014 to May 2015. The steering group of this process was composed of four CEFIRE advisors and its director, who started a seminar to design an integrative evaluation plan, capable of assessing a variety of teacher training activities, such as conferences, seminars, and longer training programmes for school leaders; and more specifically, their impact in VET schools Although it was meant to be an internal peer learning process, the steering group was also assisted by an external researcher and counsellor on training evaluation.

The theoretical framework of the seminar was the holistic evaluation model by Pineda (2010), which considers six evaluation levels: trainees' satisfaction, trainees' learning, training pedagogical quality, transfer of learning, training impact and return on investment of training. Each of these levels was analysed and discussed – ROI level was not included in this seminar but will be approached in the future. The active participation of CEFIRE advisors allowed debating on the possibilities and challenges for evaluation in this specific context; the final result was a document that is the starting point for the development of an integrated evaluation model of in-service training for VET teachers.

In this paper, some of the seminar analyses and conclusions are presented, specifically on three aspects that appeared to be crucial to enhance training effectiveness.

The current evaluation practices will be presented, as well as the proposals made by the steering group for the next academic year.

Training needs analysis

Although it is not an explicit evaluation level by itself, training needs analysis can be considered as the first step of evaluation; as well as a pivotal moment to plan training activities that suit teachers' and schools' priorities, demands, and capabilities.

Nowadays, CEFIRE designs its training activities considering the guidelines delivered by the Teacher Training Services and general educational policies. On the other hand, CEFIRE advisors administer an anonymous survey to teachers, with the aim of identifying their perceived needs and proposals. The response rate for this survey though has been decreasing during the last years, concerning scientific and Technical Training. Consequently, the advisors often have to use their own perceptions, experience, and knowledge when assessing teachers' training needs. Moreover, this questionnaire does not allow detecting training deficits if teachers are not aware of them.

In order to overcome the existing problems, the following measures are proposed. In the first place, it should be teachers' obligation to respond to the survey on training needs. Every year the internal training coordinators of each VET school

convene a meeting with the entire teaching staff, so it is suggested that these coordinators supervise the collection of this information from teachers, and make this information accessible to the CEFIRE.

Moreover, to improve the response rate, the steering group suggested making the questionnaire not anonymous, or anonymous but codified; in a way that the schools' training coordinators can remind to fill the survey to those teachers who have not done it yet; but CEFIRE advisors cannot access teachers' personal data.

Other changes that will be implemented in this survey aim to assure the alignment of the training activities proposed by teachers with their VET teaching specialties. In this sense, teachers will be asked to:

- Link their proposals for training activities they would like to attend, to some of the professionals modules they are teaching;
- Express a reason why they would like to participate in such training activities, whether personal reasons or professional ones;
- Write down some of their professional activities where they plan to apply the new learning.

On the other hand, the new survey will also include the competence-based approach for teacher training. Thus, teachers will be asked to illustrate the training content they need to work on, and link them to teaching transversal competences: intra and interpersonal; didactic, organisational and managerial; management of the common life; teamwork and innovation; and linguistic, communicative and digital.

Finally, during the counselling process with the steering group, the awareness of the importance of teachers' personal motivation arose. This consideration, together with the fact that sometimes teachers seem to sign up for training activities without a real professional interest in the contents – which can cause drop-outs or lack of training outcomes –, led to consider including in the enrolment form a motivation scale and an open-ended question about the reasons to participate. In such a way, trainees may think more carefully whether the specific training activity suits their professional needs and their VET-school reality. This information can be useful for CEFIRE advisors, who can use it in case they have to select applicants.

Evaluation of learning

It is noteworthy to mention that, in Spanish context, the in-service training system is a quite close concept to the "Further Education" of German or Norwegian traditions (Mirsa, 2011). Indeed, it is not only meant to be a way to keep up-to-date and there are mechanisms to formally acknowledge and validate teacher learning, in order to get promoted or access further training (Orden 65/2012).

However, in Comunitat Valenciana, current regulation on training certifications only requires trainees to participate actively in the training activity, to attend a minimum of 85 % of its sessions, and to conduct the compulsory training tasks,

in order to get a positive assessment. According to these legal requirements, it currently is common neither to evaluate trainees' learning nor to follow common evaluation criteria. The strong conclusion of the steering group is that this level should be evaluated and that different stakeholders' evaluations should be triangulated. Three agents were suggested as evaluators: trainers, trainees, and CEFIRE advisors.

As far as the trainers' evaluation is concerned, they will be asked to create a short test as part of the main content of the training activity. This test (possibly along with a more general test, designed by the advisor) will be administered to the trainees before and after the training activities, in order to get a simple but clear evidence of learning progress.

Furthermore, this measure will be complemented by some more subjective evaluations by trainers, trainees, and advisor, who will complete the same check-list on their perceived achievement of the specific training goals.

Evaluation of training transfer

Transfer, as the "degree to which trainees effectively apply the knowledge, skills, and attitudes gained in a training context to the job" (Baldwin & Ford, 1988, p. 63), is one of the most interesting aspects to evaluate in order to prove the outcomes of a training activity, and to be accountable for the public effort on teachers' professional development. This is a very complex level to evaluate, though since the transfer process involves different mediator elements, and it should be analysed over time.

During the seminar, two different approaches to evaluating transfer were discussed: direct and indirect evaluation (Pineda-Herrero, Quesada-Pallarès & Ciraso-Calí, 2015). These two approaches are understood as complementary, and a combination of both is proposed.

Direct evaluation of transfer consists of measuring transfer degree through specific techniques and instruments. In this case, perceived transfer will be evaluated by trainees 3 to 6 months after the training activity with a questionnaire. This tool will be specific for each training activity as trainees will have to give transfer evidence regarding each of the training goals as well as an overall transfer degree, and their own perception about the contribution of the training activity to the prior situation of their VET school, or their professional tasks.

The steering group also discussed measuring transfer objectively (Wang, 2002) using systematic observations at VET schools. This strategy is considered to be beyond CEFIRE competence; however, it may be considered by the schools' training coordinators as part of their own internal evaluation.

As complementary to direct evaluation of transfer, indirect approach (Pineda-Herrero, Quesada-Pallarès & Ciraso-Calí, 2015) focuses on generating a model of those factors that may determine transfer, so an intervention to enhance transfer can be designed. This approach is generally less time consuming and does not require

specific tools for each training activities; on the other hand, it provides less detailed information, but which is more easily compared or generalised. During the academic year 2016−17, a model to evaluate the transfer of learning factors in a school setting will be used for training offered by CEFIRE. This model (Ciraso-Calí, Rebollar-Sánchez & Quesada-Pallarès, 2016) fed on a consistent fieldwork and literature review on factors of transfer: from the starting point of Baldwin and Ford (1988) dimensions, to the new contributions on motivation to transfer (Gegenfurtner, 2013), transfer-oriented training design (Quesada-Pallarès & Ciraso-Calí, 2013); and the specific factors for educational settings such as school and teachers' attitudes towards change and innovations (Tejada & Giménez, 2007; De Miguel et al., 1996; De la Torre, 1994); school organisation and climate (ICE, n.d.); training design and management (Pineda et al., 2007); and impact (OECD, 2013). This model underwent a validation through confirmatory factor analysis and modelling techniques, and this administration to a representative sample of VET teachers will allow us to establish which the most significant factors of transfer, for their specific training and context, are.

Conclusions and discussion

Evaluation of in-service training is still a challenge in many contexts and institutions; and considering the complexity of teachers' settings and the multiple tensions and imperatives VET teachers are expected to meet (Wärvik, 2013), this is an even more delicate issue.

In Comunitat Valenciana, much work still has to be done in order to establish a coherent evaluation framework for teacher training activities; but this reflection process set the baseline to further develop it. Although CEFIRE members' initial interest was the impact of training, to approach the evaluation as a global process allowed highlighting the relationships among different phases of evaluation. For instance, the importance of training needs analysis for future transfer is acknowledged, and the element of commitment to transfer (Quesada-Pallarès, 2014) is introduced. However, a more in-depth work needs to be realised, in order to design all the evaluation tools and take into account other perspectives, including the involvement of VET students in determining transfer and impact of teachers' learning, and a more elaborate needs analysis in terms of skills gap and resources analysis. Nevertheless, CEFIRE members proposed the presented evaluation strategies according to their particular situation and taking into account the priorities and resources of their institution. Ultimately, any evaluation model needs to be contextualised and designed from a reality-based critical observation, rather than replicated.

A solid evaluation system contributes not only to enhance the quality of training and to start the upward spiral of planning, implementation, evaluation and reflection (Buck, 2005); but also, it can help institutions and training authorities to prove their achievements, justify their plans and measures, which can ultimately improve those governance issues that have been emphasized in Sub-Sahara Africa

VET systems (Salim et al., 2005; Grossman & Naanda, 2006). Hopefully, other organisations can benefit from this learning experience and design their own evaluation framework, considering their specific needs, concerns and potentialities.

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Participatory research on teaching practice as basis for teacher education and networking between universities and VET schools

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Abstract

This article focuses on illustrating the transformative nature of participatory research and the subsequent benefit it has in networking universities and VET (Vocational Education and Training) schools. The article was produced based on one of the authors wide qualitative research work on the educational practices of about hundred VET schools Mathematics and Italian language teachers. The teachers were selected to participate in the research from thirty-two VET schools found in eight different administrative Italian Regions. The project was conducted with the assumption that research should lead to transformation rather than just to an increase in knowledge. And this can be done by generating theory about teaching practices from the personal and practical knowledge of teachers. Therefore the research intended to make shareable a rich set of working tools participant teachers had used and found effective. Data were collected through individual and group interviews, and analyzed using a mix of grounded theory, phenomenological method, and narrative inquiry. The practitioners were involved in all stages of the research process as active collaborators and experienced the possibility to develop professional knowledge reflecting together about their practice. So, this research allowed to get over the traditional view that recognizes theory as the only legitimate source of professional knowledge and to go beyond the traditional separation – and sometimes mistrust – between researchers and teachers. Having tried to foreground the specificity of teachers' practical wisdom in the Italian VET context, the research itself became a chance to build network, mutual trust and partnership between University and schools. Recognizing practice as the source of a legitimate form of knowledge, participants acknowledged the research process as a meaningful opportunity of personal and professional development. Therefore, participatory

research is found to be a relevant tool for accompanying teachers in the development of new insights and shared styles of teaching. Besides, it can also play a vital role in establishing healthy relationships between universities and VET schools.

Keywords

Teaching practice, teacher education, qualitative research, Italian VET System.

Teaching in VET schools in Italy. An already undertaken research about teachers practice

The last few decades have witnessed the emergence of a new field in empirical educational research, both in Italian (Damiano, 2006; Fabbri, 1998; Grassilli & Fabbri, 2003; Laneve, 2006; Mortari, 2009, 2003) and international literature (Day et al., 2006; Perrenoud, 2001; Blanchard-Laville & Fablet, 2000; Clandinin, et. al., 1997; Zambrano Leal, 2007). These studies have started to question a traditional view that recognizes theoretical knowledge as the only legitimate source of professional knowledge and tried to foreground the specificity of teachers' competence and practical wisdom. Consequently, practice has been acknowledged as the source of a specific, legitimate form of knowledge that is, however, always in danger of not being told or passed on. The "new instructional research" (Damiano, 2006) got to a genuine turning point, by focusing on practice and by criticizing the traditional 'divorce' between the researcher's theory-based knowledge and the teacher's experience-based wisdom. Other empirical studies on this subject (Mortari, 2010; 2013) have fostered awareness that teachers' practice-grounded and often tacit, unarticulated knowledge is essential to research on teaching. In spite of the growing awareness on these issues, calls for empirical studies, which recognize the value of teachers' practices in VET (Vocational Education and Training) system, remained largely unanswered in Italy. Therefore a research project, driven by the main author of this paper in the last years, intended to explore educational practices in initial VET context, while putting the participant practitioners at the center of the research action, as protagonists and source of knowledge (Tacconi, 2011), and involving researchers and practitioners effectively in a process of verbalizing the in their work embodied practical wisdom. The didactics this study intended to focus on are "at work" (these are the terms "al lavoro" used in the title of the book outlining its findings) in different ways: as instructional method that enhances work experience, as source of authentic learning, as action represented while it is happening, "at work" precisely, and as practice that by definition is always unfinished, in progress, and for this reason always improvable.

The Italian VET system as research context

All participants in the above mentioned study were teachers of Italian Regional VET centers. In the past years, the Italian education and training system has

undergone a deep reform. According to the amended Constitution, the national Government and the Regional Authorities shall collaborate to develop a unitary VET system. The VET system in Italy is very articulated (Tacconi, 2015a). The National government is responsible for technical and vocational schools (5 years after the students have completed the 8 years of the first cycle). The Regional authorities are responsible for another typology of course, the initial Vocational Education and Training (3 or 4 years after the first cycle) providing specific vocational skills. These courses cover almost all sectors of the economy, and lead to the award of a vocational qualification certificate recognized at national and European level (level 3 or 4 in the European Qualifications Framework). Both channels (state-run technical and vocational schools and regional VET centers) are linked with Higher Education, higher technical education and training, and the world of work.

The aims

Based on the above mentioned previous research work (Tacconi, 2011), conducted with the assumption that research should lead to transformation (Mezirow, 1991) rather than just to an increase in knowledge, the present paper intends to illustrate the power of participatory research in generating and transforming teaching knowledge and skills. The previous work intended to devise and make shareable grounded-based theories, which are useful for practitioners. The paper underlines that this kind of research can promote beneficial changes in the practices it studies and, encouraging both teachers and researchers in the development of new insights, can lead them to rethink also their mutual positioning in the process of doing research. The paper is also meant to unpack the benefit this kind of research can have in networking universities and Vet schools.

Theoretical and methodological framework

The world of practice is complex and researchers who want to focus on it as the object of their investigation face a bold task (Dahlberg et al., 2002). From an epistemic perspective, the problem in the research was to identify the most suitable method for investigating teaching practices. The positivistic paradigm in human sciences has long prevailed, but, in the last few decades, other paradigms have been developed (Guba & Lincoln, 1985; Mortari, 2007) and the use of qualitative approaches has increased.

As a result, the research was developed on the basis of the following methodological tenets:

- a phenomenological philosophy of research, which essentially means being faithful to the phenomenon. In order to follow this phenomenological principle, it was necessary to choose a method of investigation, whose ultimate goal was to understand experience in the way practitioners have understood and lived with (Smith, 2004);

- an ecological and participatory approach to research, which means that the investigation has to be carried out with the participants, rather than on them, and in the contexts where they are acting. Therefore, this project was developed by involving actively the protagonists of VET practices in the Centers where they were working and by appreciating their practices (Elliott, 1999);
- qualitative methods, including a mix of grounded theory, phenomenological method, narrative inquiry, and other research strategies, which are methodologically congruent with one another, were used to explore the phenomena under investigation and to generate a new practice based teaching theory from VET teachers.

Reflecting upon these heuristic and epistemological aspects of doing research is very important, not only for the researchers but also for the practitioners. Reflection represents a pivotal element not only in the present-day research landscape (Mortari, 2009)[1], but also in the field of teacher education where transformative learning is highly needed (Schön, 1987; Lampert, 2009).

Data collection and analysis

The mentioned research work (Tacconi, 2011) was conducted by collecting in-depth face-to-face, 60 to 90 minute individual interviews (n = 27) and small-group interviews (n = 9, involving a total of 108 participants) from Italian and Mathematics VET teachers about their teaching practices and how they were reflecting on their own experience. Teachers who volunteered to take part were selected from 32 VET Centers which are part of the Cnos-Fap Federation[2] and are located in 8 different Italian Regions. They were chosen among those whom principals and colleagues recommended and reported as being excellent teachers. They were invited to report in detail examples, cases, episodes and anecdotes from their real daily experience in which learners were engaged in learning situations. In the small-group interviews they were also invited to complete member checks, as well as to create further narratives. At the end of each small group interview, the author asked participants to explain what they thought about the conversation.

All interviews were audio-taped and transcribed verbatim. Data analysis was conducted by the constant comparison process described by Mortari (2007), who proposes a hybrid of grounded theory (Glaser & Strauss, 1967) and phenomenological method, but also through the production of narratives (Clandinin & Connelly, 2000). The phenomenology suggests the fundamental attitude of the researcher. In the phase of data collection, but also in the phase of data analysis, it helped to listen attentively to the participants, to read and re-read the texts of the transcriptions in search of a deep understanding of the phenomena.

1 Only by cultivating their inner gaze, will researchers be capable of developing an outward gaze that allows them to understand the experience of others.
2 See the Cnos-fap web site: www.cnos-fap.it.

The analysis was conducted according to the grounded theory (i.e. identifying relevant narrative units, coding them, clustering the labels, letting gradually categories and links emerge out of them, in a recursive process). It helped to identify a list of core themes and examples of stories which could explain them. Only stories indeed can give back the complexity of the teaching practice and the resourcefulness, inspiration, intelligence and concreteness of the practitioners.

One of the important steps utilized by the "mother research", which is also worth mentioning here, was the validation of the analysis of the stories by participants. Member check was done during intensive group meetings with the purpose of reflecting on and discussing the emerging categories in order to assure that the researcher's interpretations were remaining adherent to the meaning of the participants' descriptions, but also to explore the impact of the process on the practitioners' way to reflect on their own practice.

In order to reach the aims of the present study, the transcriptions of the group meetings were re-analyzed according to the same approach. In addition, written feedbacks of the participants and of the readers of the published study were collected and analyzed.

Findings

The main study came up with some findings, mostly in the form of a reservoir of experiences connected in a new practice-based theory, that may well guide teachers' practice in both subject areas under study, Italian and Mathematics, but also in the more general field of VET, and in the field of development of a teaching attitude (Tacconi, 2011)[3]. The crucial importance of some directions in the VET practice emerged from the developed theory. They are the following:

- being aware of the learners;
- taking care of the relationships with learners and colleagues;
- arranging authentic learning situations;
- focusing teaching/learning practices on learners' experience and above all on their work experience;
- setting assessment and evaluation as appreciation of learners' achievements.

The key-attitude emerged from the above mentioned directions is the stubbornness with which teachers are oriented to look for a personal response and motive of each of their students.

The new analysis of the collected feedbacks showed that the research was able to improve the understanding of the nature and features of expert teachers' practical knowledge and of the way one can "transfer" it to other teachers in a community of practice (Wenger, 1998). Indeed participants recognized that the research created a true community of practice among them. Often in the process of the small-group

3 For the extended description of the model that emerged from the data, with the participants' quotes from the interviews, see Tacconi, 2011.

interviews, the stories of one teacher stimulated also other teachers to narrate and to share experiences.

Something similar happened also later to the participating teachers who, having developed a real sense of belonging to a community, remained in contact with each other and continued to enjoy sharing stories, asking to their federation to provide them with an online space for sharing[4].

Also other VET teachers who read and discussed the published work or some parts of it during in-service training courses recognized some traits of their own experience (their own voice) in it and felt encouraged to reflect on it and to share their own experiences with their colleagues. Above all, they met a form of knowledge they could consider not as abstract knowledge (or as a principle that "should" be applied) but as experiential ("extracted") knowledge that motivates them to think about their practice, to interrogate it, and to experiment solutions which other teachers had found helpful in similar situations.

The research has also allowed to get over the traditional separation between university and schools or VET centers and the mistrust between researchers and teachers. The research itself became a chance to build dialog, mutual trust and partnership: the author worked with the raw material of the participants' experience, and the reflective process implemented by the research itself was recognized by all participants as an effective and meaningful opportunity of personal and professional growth and development. Many of them stated that sharing stories helped them to give value to what they learnt from their experience, but also to think sometimes differently about their own practice and to enlarge the mental space of what they thought as possible and practicable in their teaching experience.

Conclusion

The article succinctly showed that the previous qualitative research generated practice-based teaching knowledge that is close to real practice whereby practitioners could easily draw lessons for their own experiences. Understanding of learners, creating positive rapport with learners and colleagues, letting students learn through doing authentic activities, taping up learning practices upon the prior experiences of learners and using assessment and evaluation as a mean of recognizing achievements were elements emerged from the true and lived experiences of practitioners as relevant tools for facilitating students' learning. These practices are well documented in the book derived from the qualitative research (Tacconi, 2011).

The focus of this article was to underline that the same approaches followed by doing qualitative research are also suitable to drive professional learning processes that can be perceived as meaningful and stimulating. These approaches were namely: diving in the contexts of practice (*naturalistic inquiry*), appreciation (also in

4 This space is available through the following link on the Cnos-fap website: www.cnos-fap.it/page/cfp-si-rinnova.

the sense of feeling gratitude) of the subjects and their practices as sources of relevant knowledge (*appreciative inquiry,* Elliott, 1999), social welcoming approach (*participative inquiry*), careful organization of setting and attentive and non-judgmental listening (*phenomenological approach,* which also requires a careful listening to oneself and a continuous reflective wakefulness), attention to create a useful knowledge, preference for narrative (*narrative inquiry,* Clandinin, 2006), construction of embodied thoughts, local theories, and concepts which are rooted in concrete situations (*grounded theory,* Glaser, & Strauss, 1967). Such approaches have therefore both heuristic and formative character.

In this kind of research, researchers and practitioners, including universities and VET schools, need each other and are called to build up a mutual alliance (Damiano, 2006). Researchers need the practitioners' experiences to construct a relevant knowledge, and practitioners need researchers to give symbolic form to their lived experiences. In this process both researchers and practitioners can learn a lot dialogically, teachers do not feel to be considered empty vessels, but sources of knowledge, and begin to see themselves as researchers. In this sense, the involvement in a research process can be seen as one of the best ways for fostering teacher education and training.

Starting from this research project, a network between the University of Verona and the Cnos-fap Federation has been built. Both institutions are part of the newly formed Center for action research on Vocational Education and Training (www.carvet.org). They collaborate in other research projects (Tacconi, 2015b) and in managing the section of the Federation website that documents the common endeavor in the field of VET-teacher education (http://www.cnos-fap.it/page/cfp-si-rinnova) and makes possible to share tools, lesson plans and other materials VET teachers develop to facilitate students' learning.

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TVET-University Nexus: Room for Synergy

Ewnetu Hailu Tamene

Abstract

Ethiopia has made strides from 'nothing to something' in the area of Technical and Vocational Education and Training (TVET) teachers/trainers, within the last two decades, although there is still a long way to go. As the system is changed from supply oriented to outcome based, systematic further education and training (FET) of TVET trainers through which they become abreast with fast growing technology and needs of the world of work is getting essential position and is the central concern of this article. It calls for consideration and detailed exploration of the potential synergy between TVET and Universities based on Jimma experiences of 'VET-Net'; networking with five TVET cluster centers in South Western Ethiopia from Nov. 2012—March 2014. The data is collected through in depth interviews; short skills gap training, focus group discussions and visits to four cluster centers. Findings of the study are: the absence of systematic on the job further education and training of trainers; fear of theory driven teaching and learning approach in the university versus dire need to work with universities: on technology transfer, short skills gap training, experience sharing, efficient use of resources were found to be untapped part of both institutions potential for synergy. Operationalised and contextual interactive collaboration is recommended.

Background

Ethiopia shows commitment to participate in the competitive global market economy. Putting Technical Vocational Education and Training (TVET) at the centre of education aimed at marketable and entrepreneurial skills as a part of comprehensive human resource development programme. The term TVET used in this paper follows the definition used by Ethiopian Ministry of Education as 'overreaching term that describes all modes of formal, non-formal and informal training below Higher Education provided by public and nonpublic providers and companies (MoE,2008). The Government put effort to the sector with the promulgation of the new education and training policy of 1994, and successive implementation

strategies: Education Sector Development Programmes (ESDP 1−5). The effort made to change the sector from traditional supply oriented TVET to outcome based system through successive reforms (MoE, 2006, 2008, 2010) evidenced a big stride to modern TVET best practices. Hence the TVET sub-sector currently reached the level of accommodating about 80 % of the 10th grade leavers, sharing with teachers training colleges. The transition rate to TVET reached 45 % of students completing Grade 10 in 2013/14, (MoE, 2015). Table 1 shows the trend in enrollment, trainers and institutions of TVET in Ethiopia over the last fifteen years.

Tab. 1 Number of teachers and students in TVET schools in Ethiopia

Year	Enrollment	Teachers	Institutions	Remark
1999/00 (1992 Eth.C*)	3,427	523	25	
2005/06 (1998 Eth.C)	123,557	6,134	264	
2010/11 (2003 Eth.C)	371,347	12,990	505	
2013/14 (2007 Eth.C)	238,049	12,779	437	The decrease is due to under reported data (MoE, 2015: 67)

* Ethiopian calendar

Source: Education Statistics Annual Abstract, MoE 2000, 2006, 2011 and 2015 (compiled by author)

With regard to the progress made Kingombe (2012) writes, the Ethiopian approach to TVET reform and TVET are in line with international best practice. The recent growth in TVET enrollment and provision has been achieved by a substantial development of public spending and increased TVET provision by private institutions.

In Ethiopia, after the TVET reforms in 2008, teachers/trainers are classified into three levels: A-level trainer, who has a Masters degree; B-level teacher/trainer, who has an undergraduate degree in required field of study and C-level teacher/trainers. These, C-level, trainers are who complete TVET Level 4 and have their competence assessed, have an option of receiving additional pedagogical training. In principle after receiving training they are qualified to teach TVET levels 1 and 2. These trainers after having been qualified as a level C instructor can go on to the special teacher training institutes for 3 to 4 years to become B-level instructors. The question is how regular teachers and trainers are given training to update/upgrade their skills.

In Ethiopia context, it is TVET and University institutions that formally produce work force for world of work. These Institutions are expected to produce most of the skilled and competent workforce from lower to higher level of specialty. Universities produce higher level experts with Bachelor, Masters and PhD degree, while TVET produce low to middle level: Level one to level five based on the occupational standard (MoE, 2012); primarily aiming at the need of world of work in the in the country. This shared major goal shows that both institutions have one destination however follow route. It is this shared vision which in this article termed as TVET-University nexus.

Structurally TVET resides as an activity of education however, it is disconnected from formal primary, secondary or tertiary education. TVET exists only after the completion of general secondary education and its students are those who are unable to continue their study at senior secondary/preparatory education as the result of EGSCE (fig1). There is also possibility to join TVET after failing to continue tertiary education as the result of EHEECE, fig1. It is this attribute that leave TVET students and the college as peripheral and optional school.

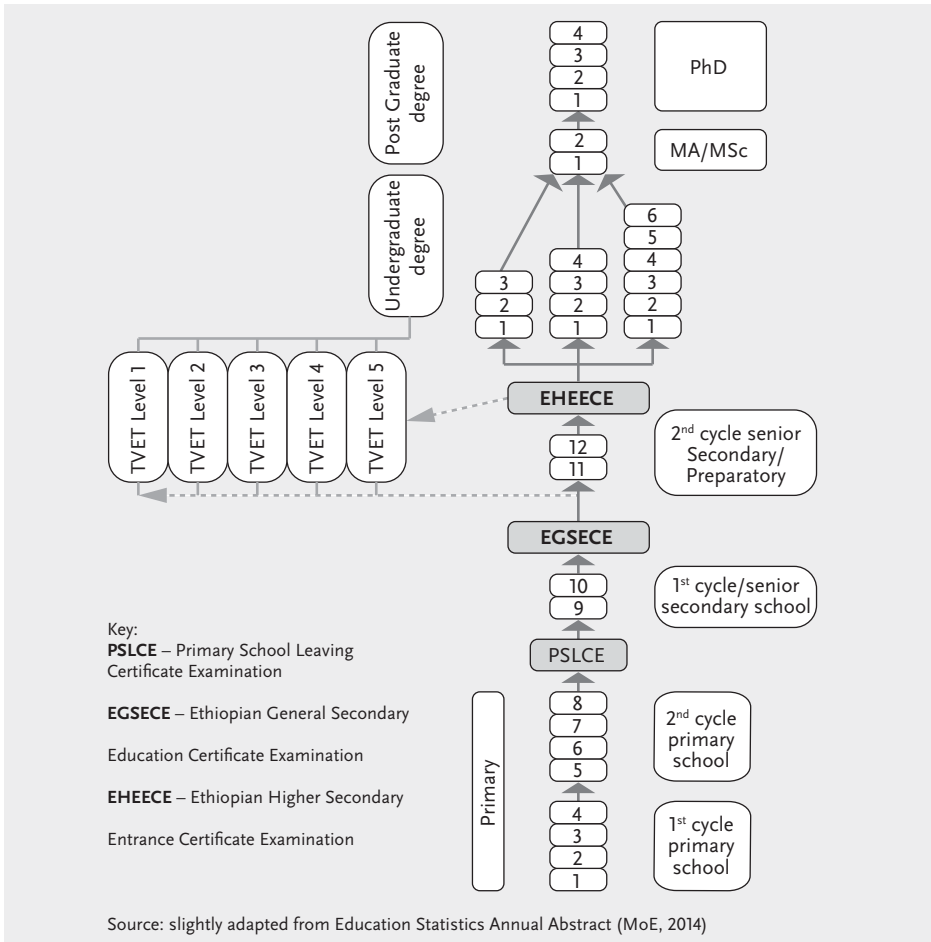

Fig. 1 Structure of formal education system in Ethiopia

Figure 1 indicates the structure of formal education available in Ethiopia, including the examinations that influence education options, particularly at the completion of general secondary education.

The concern of this paper is therefore to discuss potential synergy between TVET and University focusing on Further Education and Training (FET) of TVET teachers/trainers as part of lifelong learning. As the system is already changed from

supply oriented to outcome based then moving toward market oriented provision, systematic FET of TVET teachers/trainers through which they become abreast with fast growing technology and needs of the world of work is essential. Because the quality is then controlled by an 'invisible hand', market. It calls for consideration and detailed exploration of potential synergy between TVET and University based on Jimma University-TVET network; based on experiences of 'VET-Net'; networking with five TVET cluster centers in South Western Ethiopia from Nov. 2012−March 2014.

Rationale

In response to the need of economic development and demographic pressure many countries including Ethiopian place TVET as one of the top priorities of development agenda. However, the shortage of competent teachers/instructors is among obstacles in TVET expansion to a level the economy requires in Ethiopia. This remains important because, of the rapid technological change influences the world of work and determines the features of TVET education, as a result the knowledge and skills of TVET teachers/trainers become outdated soon. Training and re-training of TVET teachers/trainers who are already on the job, is one of the mechanisms to maintain quality (Working group, 2012) and also help to maintain competent teachers/trainers in the system.

On the other hand lack of systematic and continuous Further Education and training of TVET teachers/trainers (MoE, 2008) results not only in shortages of competent TVET teachers but also encourages turnover. Even though there are efforts, to train some teachers/trainers abroad and some in the country with various programmes, as majority of teachers/trainers have no access to Further Education and training the turnover for Further Education training was high. The lack of Further Education and training opportunity was overriding because of search for better salary, better working environment, issue of reputation and misconceptions about TVET mentioned as push factors. Consequently, the subsector suffers from lack of competent skilled teachers/trainers (MoE, 2008) the graduate lacks competence and required skill to secure job, (Birhane, 2012). My observation reveals, due to the shortage of 'A'-level and 'B'-level trainers, most of the training in suburban and rural areas is covered by 'C'-level trainers.

Discussion and Findings

The main objective of this paper was to explore possible synergy between TVET and University and draw attention for detailed exploration of the potential synergy. Accordingly, absence of systematic Further Education and training (FET), lack of work place learning model, lack of TVET and University link are important findings discussed next.

Absence of systematic Further Education and Training (FET)

It is found that there is no systematic Further Education and training for TVET teachers/trainers in which they keep updated with the fast growing need of world of work. This gap according to some of the participants, worsen turnover of competent teachers/trainers in looking for Further Education and training in the universities and or other organizations. It is one of the main challenges for the quality of training in TVET colleges.

At normal course, as time passes, what people do and how they do things changes following technology and societal change (Arnold& Patzold, 2008). However, the 21st century presents a radically different economy and society, which is likely to have profound implications on TVET (Majumdar, 2013). This capitalises the importance of well-trained TVET teachers/trainers for the movement from economic growth to human development; a bridge has to be built through the teachers. "The most important 'agent of change' in 'knowledge society' is the teacher" (Majumdar, 2013).

This stresses the concern of the system in which teachers/trainers are exposed to continuous learning and keep abreast with the fast growing technology. In line with this argument the Ethiopian TVET reform strategy acknowledges the importance developing systematic Further Education and training schemes to continuously upgrade the competences of existing TVET teachers/instructors and to facilitate life-long learning and qualification. The reform strategy states that *TVET colleges will be the center of lifelong learning* (MoE, 2008).

One of the important ways to accommodate unique feature of TVET education and maintain a qualified teacher is through Further Education and training. The emphasis on continuously providing relevant and up-to-date technical knowledge and skills is because of the TVET education unique features that knowledge and skills became obsolete quickly following the rapid change of technology mentioned above. Though Further Education and training can take different ways such as off the job and on the job, for practical and technical reasons, in the situation under discussion, I favour on the job, action oriented work place learning.

For the work place learning creates learning communities, for trainers and trainee learning together; for it create natural communication between trainee and trainer. It also gives opportunities for learners to come up with new ideas from real life and discuss with trainers as well as within the group. This facilitates learning for both trainer and trainee, encourage creativity and innovation, as it brings reality to the learning area. As the main purpose of TVET is to make people self-employed and to be a vehicle of transition from school to the world of work (Hollander and Mar, 2009), it encourages self-confidence.

Lack of Work place learning

The further learning opportunity that is available for few teachers/trainers to improve their skills and professions is the formal college based training that detached

them from the work place. There is not work place learning system. Bound & Garrick (2000), define workplace learning as a site of learning with two purposes: the development of an organisation through contributing to production, effectiveness and innovation; the second is the development of individuals through contributing to knowledge, skills and the capacity to further their own learning both as employees and citizens in the wider society. In looking to the future they argue that work place learning is not only about immediate competences rather preparing for the future. They argue as:

Workplace learning is concerned not only with immediate work competencies, but about future competencies. It is about investment in the general capabilities of employees as well as the specific and technical. And it is about the utilisation of their knowledge and capabilities wherever they might be needed in place and time (Bound & Garrick, 2000).

In this context TVET colleges are work and learning places. With the fast growing technology and strong skill based competition of world of work, workplace learning become a means by which short term and strategic goals are attained (Silverman, 2003). The concern for work place learning is to enable workers, teachers/trainers to organise social and technological resources to fit to the dynamic demand from trainees and from the world of work.

Need for TVET-University link (VET-Net[1] experience)

It was evidenced that there was and is full interest to collaborate on the areas of common interest to both institutions; the problem was the question of '*how*' to go beyond traditional memorandum of understanding. Leaders of both sub-sectors were very cautious for fear of theory driven university approach on one hand, and frequent change in TVET policy on the other hand. Above all there is 'perceived boundary' between the institutions following different learning pathways leading to one destination. Being cautious not to bear unproductive pressure to each other is right, but *we need to be sure that the fence we build is to protect 'evil' and not to prevent 'virtue'*.

Vocational Education and Training Network of Professionals of Sub-Saharan Africa (VET-Net), initiated by Rostock University, has been working since 2006 with Technical Education and Pedagogical University of Mozambique/ESTEC (Escola Superior da Universidade Technica Pedagogical – Technical College of the University of Education). This project came to Ethiopia, Jimma University by the communication of Prof. Lennartz, who was Scientific Director of Institute of Technology of Jimma University and Prof. Eicker initiator and leader of the project. The idea of the project was to train and support Further Education and training of TVET teachers/trainers by the collaboration between TVET and University. It was welcomed to the university, between College of Education and Institute of Technology; followed the signing of the Memorandum of Understanding between Rostock and Jimma University in which I served as coordinator of the project.

1 Vocational Education and Training network in Sub-Saharan Africa. http://www.vet-net.info/en/

Then we[2] adapted the international VET-Net, in line with policy context and established networks between Jimma University and five TVET colleges, cluster centers, in the Southwestern Ethiopia. These cluster centers are comparatively well-organised and chosen by Government to provide technical and professional support for other surrounding TVET institutes and Small Micro Enterprises (SME). These existing cluster centers were used as 'competence centers' to assess training needs and facilitate visits and experience sharing in communication with cooperation centre. Jimma University served as the cooperation centre among these competence centers.

We facilitated short-term skills gap training; organised materials and workshop visits based on the request from competence centres. This was convenient as it was part of their responsibility, and often times they shared costs of training.

At the start, immediate needs were identified and prioritised; duties and responsibilities of both institutions agreed on. Some of the areas immediately acted up on were short term skills gap training like basic autoCAD application, problem based action oriented research, basics of vocational pedagogy, and visits to workshops and access to selected prototypes. Concepts and practices of technology transfer. Though this project cannot claim a lot of change, it effectively indicated that there are untapped potentially synergy between TVET and Universities with strong Education and Technology background.

Conclusion

In conclusion TVET and University share common vision that entails to create competent and self-reliant citizens to contribute to the economic and social development of the country; this improves the livelihood of all Ethiopian. It is imperative to explore all possibility for the synergy TVET-University link can find ways in which TVET teachers/trainers keep updated on the on the job training model without being detached from their workplace. Ministry of education in general and local administration, as they are responsible for TVET intuitions and University leaders should facilitate operationalized contextual collaboration.

As both institutions strive to produce competent work force for the world of work, to fully effect poverty reduction and strides to a middle income country in 2025, synergy can be considered additional energy. VET-Net experience shows that TVET and Universities have a lot to do together that can be right response to the quality, right response for shortage of resources, human and physical, and other related issues that hamper the development. Above all TVET in Ethiopia in general, is barely researched, compared to other sub-sectors; hence there is a need for attention from both institutions. Universities have to give TVET separate thematic emphasis and invest small research funds they have on it, and furthermore, Government has to give more encouragement to the TVET sector.

2 My colleague, Dr. Eng. Esayas Alemayehu, from Institute of Technology and I, from College of Education and Behavioral Sciences of Jimma University

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The "three branch model" of Further Education of in-company Vocational Educators: Linking in-company Learning Projects, external training in Further Education and University Learning

Nicolas F. Schrode

Abstract

This article describes a new model of qualification of in-company vocational educators which was constructed by linking three different existing qualification paths in Germany: in-company learning, external training in Further Education and University learning. It is called *Triales Modell* (three branch model of Further Education).

Before outlining the model, this paper first introduces some facts about the group of in-company vocational educators and points out their main previous and existing training opportunities in Further Education. It especially mentions two new opportunities: The *Gepr. Aus- und Weiterbildungspädagoge* (Professional of Human Resource Services Management) and the *Gepr. Berufspädagoge* (Professional of Vocational Training) which are trainings that take up specific pedagogical needs. On the basis of research findings, the paper proposes the thesis that in addition to that there is still a need of more and other skills than these two qualifications could offer: Scientific competences that can be acquired at universities. Referring on that backgrounds, the author describes the new model. In linking the mentioned qualification paths the *Triale Modell* makes it possible to integrate the strengths of the different places of learning like practical relevance and theoretical foundation. Its construction shortens learning times, avoids having to learn the same things twice and creates new possibilities of permeability between vocational and academic education. For vocational educators it offers a chance for professionalization.

VET in Germany from a qualification perspective

The education and Further Education of vocational educators in Germany relates to several segments of Vocational Education and Training (VET): On the one hand there is a need of trainers for full-time vocational schools, on the other hand for the training in the dual system, which is divided in two places of learning: in-company training and vocational school. The following paper refers to in-company vocational educators and presents an innovative model for their Further Education which was developed and tested by the Alanus University and its partners. However, a similar model is also conceivable for vocational teachers and trainers in other training institutions.

Even the question of the quantity of the group of in-company vocational educators in Germany is quite complex. On basis of the official statistics, 652.617 persons were listed as in-company vocational trainers (cf. BIBB 2016, 224). But already the Employment Survey of 1998/1999 found out that around 5,8 million persons were involved in varying proportions with the "training of apprentices"– 17 % of all employees (see Bahl 2012, pp. 6–7). Six percent of these people were working as in-company educators as their full-time task, 14 % are self-employed and instruct trainees and 80 % are part-time Vocational Trainers.

In-company vocational educators have a broad and diverse spectrum of tasks. Their *general* task is to supervise, instruct and accompany trainees in acquiring vocational competence [cf. Vocational Training Act Section 1 (3)]. Often they are also engaged in the training of employees. Their environment is constantly changing, because technical developments like digitalization proceed rapidly as well as social changes like an increasing heterogeneity of trainees. This changing environment exacerbates the uncertainty that exists in educational situations anyway: In the words of Stichweh in educational situations, professionals are challenged to convey together their theoretical-systematic knowledge and their experiential knowledge under conditions of uncertainty and compulsion to act (cf. Stichweh 1994), which means to match abstraction with experience and problem analysis with problem solving in an adequate way.

The Trade Law Amendment of 1897, but also the introduction of the Regulation on the suitability of trainers, the "Ausbilder-Eignungsverordnung" (AEVO) in 1972 aimed primarily at ensuring the minimum requirements for the trainer activity. The AEVO can be seen as a measure of quality assurance, not as an educational qualification. Hence it cannot meet the demand for pedagogical competencies by far (cf. Brater/Wagner 2008; Brater 2011).

Such educational requirements are (cf. Brater/Wagner 2008, 8):

- Vocational Educational skills, which encompasses competence in the use of a wide range of professional pedagogical methods (sovereignty of methods) and for the competence to design and control training processes in the core,
- competence in pedagogy and psychology of youth, understood as the ability to accompany trainees through the entire training process including crises and problems as well as the ability to individualize learning processes,

- counseling skills that include everything that the full-time vocational educators need for selection, acquisition, monitoring, leadership and guidance of the part-time vocational educators,
- management skills, such as education marketing, candidate selection, education controlling, acquisition of orders or calculation.

On the basis of the findings of comprehensive studies (ibid.; Bauer et. al. 2008), two new vocational training courses with state-certified degrees have been developed: the "Gepr. Aus- und Weiterbildungspädagoge" (Professional of Human Resource Services Management) and the "Gepr. Berufspädagoge" (Professional of Vocational Training). Both degrees address besides in-company vocational educators, experts in human resource management (HRM) and coaches on the free market. The degrees are given by the Chamber of Industry and Commerce and are located on European Qualification Frame (EQF) level 6 and 7 and thus correspond to the Bachelor and Master level of University education. Didactic principles are a strong practical orientation and a project design. With the implementation of these new possibilities for the first time ever in Germany, a real profession (*Beruf*) for trainers emerged at the horizon of possibilities and with it the chance to establish an own professional identity.

But not only this professional chance and the EQF level of these qualifications, but also research findings suggested to add an academic qualification. So Schrode et. al. (2012) found out that many technical requirements of in-company vocational educators at middle management level are covered in these two Chamber degrees, but that further competences are required which are not included in them, e.g.:

- Special thinking and working methods like the ability to look at concepts and theories as well as on the own work from different angles and so coming to new judgements; to analyze the own thinking and ones working methods critically, to reflect the own practice and check and evaluate it systematically. But also to be able to read and understand scientific studies, models and concepts and transfer them adequately into the own practice.
- Specific attitudes: to approach things questioningly and searchingly, to interpret and understand open and imponderable situations; to take critical distance to things and to oneself.

So for VET trainers who are not only doing shop floor training activities but also are involved in counseling and in developing new concepts, we found a need of further skills and competencies – this group does not just need a lot of experience based knowledge but also the ability to deepen, analyze, reflect and continuously renew it. With these abilities, vocational educators can advance VET autonomously, be innovators. Such claims can be found in scientific competence.

However, it would be ineffective and costly to disregard the existing qualification pathways and to move it completely to University. Rather, a supplement appears to be a viable option, which can be found in a sensitive combination of different existing forms of education and their places of learning.

The "Triale Modell" (three branch model) of the *Master of In-Company Vocational Education/Adult Education*

On the basis of these findings, the Alanus University, the Alanus Werkhaus Center for Further Education and the Association for Research & Development in Vocational Training an Occupations (GAB München) developed the "Triale Modell" for in-company vocational educators, trainers/coaches in Further Education and HRM experts (first description of the idea: cf. Eicker/Reibstein 2007). The project group was funded by the Ministry of Education and Research, which financed the development of a three-branch model for VET educators in three model regions (Rostock, Bremen, Alfter/Bonn, Schwäbisch Gmünd). It was supported by big companies. The theoretical bases are theories that describe professionalization by the combination of different forms of knowledge (cf. especially Meyer 2000, Pfeiffer 2012, Meyer 2012).

Until then, there was a possibility for in-company vocational educators to acquire the AEVO after the own VET-degree and then start the education of trainees. With three years of experience, one could add the Professional of Human Resource Services Management, with five years of experience or after finishing this step, one could start the training for the Professional of Vocational Training. Only after completion of such a chain, one could take the step to a university (except of those with the degree "Abitur", which can go directly to university, but are rare in this group). However, this qualification path took at least six to eight years in total and was therefore unattractive for in-company vocational educators that were working.

The idea of the "Triale Modell" (three branch model) is to link the VET-work, the educators do in their companies in the form of learning projects, with external training in Further Education (Professional of Vocational Training – Chamber of Industry and Commerce degree) and university learning (Master degree) (see Figure 1). By doing so, it is also possible to link the specific different valuable principles and contents of learning at these three places. (see Table 1)

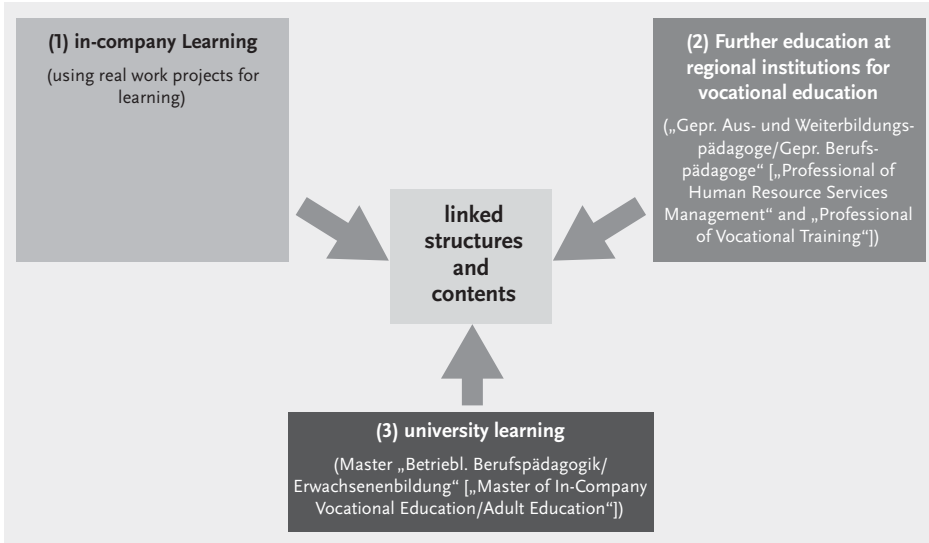

Fig. 1 “Triales Modell” – integration of places and contents of learning

Tab. 1 Principles and contents at the different places of learning of “Triales Modell”

(1) Learning at work (in-company learning projects)	(2) Learning in courses of regional institutions for Vocational Education	(3) Learning at the university
• *context:* real and responsible working-tasks in institutions for VET, adult education or HRM projects are selected on the basis of individual learning needs • *forms of learning/teaching:* regular tasks are prepared to become an individual in-company learning project by analyzing the opportunities for learning of competences in each task theoretical learning is integrated (and finds its way in from the (2) and (3)) = informal learning/learning by doing, discovering learning, learning on the own responsibility Learning-facilitation by colleagues/ other trained trainers (system of GAB München) The *curriculum* is given by/made from everyday real work situations of in-company vocational educators • *Examples for projects:* “development of a quality management system for the company training” or the “introduction of instruments of competence assessment for trainees” – *all complex real tasks in the field are possible*	• *context:* off the job, but connected to (1) by projects (on-the-job-projects as the “backbone” of the training in courses) principle: Participants experience as learners what they should do as trainers (action-orientated teaching) • *forms of learning/teaching:* experimental games, role-playing games, practical experiments, group work, etc. many opportunities for accompanied practical exercises and experiences trainers/teachers as facilitators of learning (what they themselves had to learn before) • *main contents of the curriculum:* (based on the findings of Bauer et. al. 2008) training methods and different didactic orientations; on the job learning and teaching; how to identify learning needs; facilitation of learning (broad programme); coming along with problematic trainees, recruiting and quality assurance (control in dialogue); how to plan, calculate and realize training measures; designing and carrying out tests and examination/competence assessments; organization development, leadership	• *context:* off the job, but connected to (1) and (2) all previous experience and learning is acknowledged • *forms of learning/teaching ...* ...follow the same didactical principles as in (1) and (2): learning on the own authority, work in groups, discovering learning, action-oriented learning, real projects integrated ...) – not only frontal teaching! lecturers as facilitators (especially prepared for that task) High importance of application, but very important task: to convey the scientific approach, dealing with theories, the multiple perspectives of science and scientific methods Many opportunities for active handling the scientific material and reconsidering the own views • *main contents of the curriculum:* (based on the findings of Schrode et. al. 2012) theories of learning and teaching, educational psychology, pedagogy, sociology, educational system, world of work, motivation, learning and development in youth and

(1) Learning at work (in-company learning projects)	(2) Learning in courses of regional institutions for Vocational Education	(3) Learning at the university
(learning today has become too important to be left to institutions)	and management of VET and educational institutions	adulthood, history of education and professional training, vocational training of persons with handicaps or learning difficulties, heterogeneous and multicultural learning groups, German and European politics for VET, theory of science and methods of action research (learning how to make practically oriented and evaluation research projects), Scientific transfer- and application projects in their companies

The model generates the possibility to satisfy the needs identified by enabling a continuous, but less time-consuming education chain ranging from the lowest to the highest level (Figure 2/Table 2).

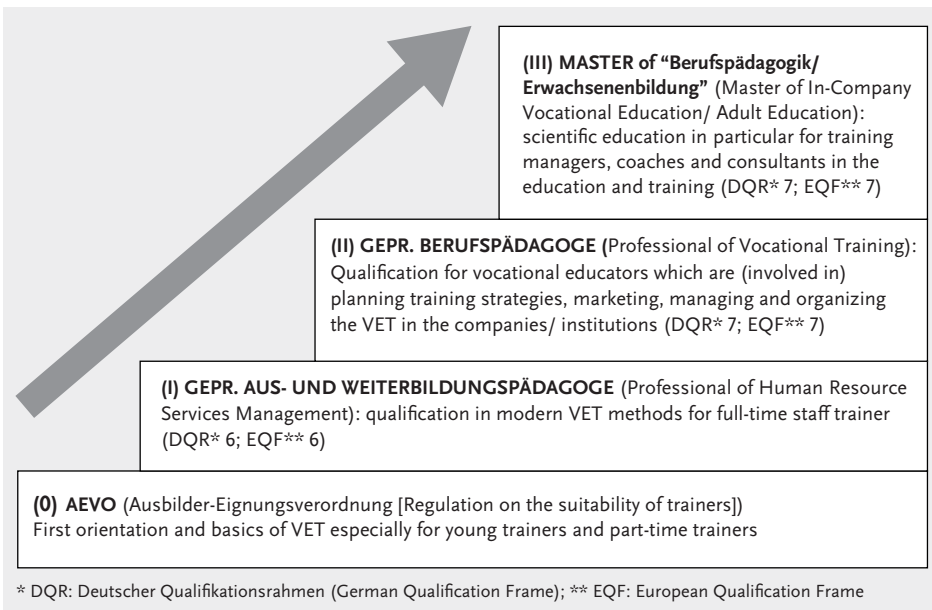

Fig. 2 Continuous training in a lifelong learning context for VET-trainer ("Trialer Berufspädagoge")

Like Table 1 shows, a main issue of the model is to profit from the strengths of the different places of learning. So the idea behind in-company learning projects (1) is to bridge knowledge, skills and reflection in action (in workplace learning): In the own work, problems arise for which's solving new methods (2) and theoretical knowledge (3) and/or reflection in groups (2 & 3) will give hints or ideas for new successful ways of acting. Conversely, findings made by working (1) can be supplemented by theoretical knowledge (3) or group reflection (2 & 3). Especially against the background that dealing with the atypical has become normality in modern work – especially in pedagogical work – it seems to become increasingly

important to acquire the ability to intrapersonal match objectifiable knowledge (for example scientific backgrounds) and subjective skills (like practical knowledge, but also a kind of 'feeling' or 'sense' based on informal knowledge, developed in and for one's work) adequately and reflected (cf. Buschmeyer et. al., forthcoming). That is the theoretical idea behind the described combination which aims the acquisition of a holistic competence for professionalized practical action.

For VET trainers this means e.g. to know pedagogical and didactical theories as well as to master tools to arrange learning situations and develop pedagogical sense. The professional competence can only be acquired by solving real complex work tasks by using these knowledge(s) and skills.

In short it means: learning of theoretical backgrounds, special ways of thinking and specific attitudes at the university, learning vocational training tools and methods at regional institutions for Vocational Education and acquiring experiential knowledge and *the ability to interlink those components* in real work. This allows the chance to combine practical knowledge with theoretical knowledge, to critically question the current practice, to use new methods and to improve one's professional action.

Depending on the individual entry requirements, there are four part-time variants to realize the model: 1. interconnected ("verzahnt"), 2. integrated, 3. consecutively, 4. à la carte (see Table 2).

Tab. 2 The different variants of the "Triales Modell", their target groups and benefits

variant	(1) interconnected	(2) integrated	(3) consecutively	• à la carte (in testing*)
target group	Simultaneous qualification as *Professional of Human Resource Services Management* and *Master of In-Company Vocational Education/Adult Education* (and optional: *Professional of Vocational Training* additionally) Both are parallel tuned in content and time (after $1\,^1/_2$ years: *Professional of Human Resource Services* Chamber exam and after $2\,^1/_2 - 3$ further years *Professional of Vocational Training* (Chamber exam) and the *Master* (University exam)	For participants that already successfully passed the exam *of Professional of Human Resource Services* or another qualification on DQR level 6 and have minimum five years of practical experience as VE-trainer or an equivalent activity (e.g. in in-company Further Education or personnel development) *or* a *Bachelor* degree with minimum five years of practical experience as VE-trainer or an equivalent activity	For participants that already successfully passed the exam of *Professional of Vocational Training* or another qualification on DQR level 7 with minimum five years of practical experience as VE-trainer or an equivalent activity.	For experienced practitioners from VET who wish to acquire specific contents of the Masters Course and for visiting individual modules of the Master's programme (short cycle programme) The modules are certified and can be counted later on a Master degree, if one decides to study a Master programme.
benefits	This variant optimizes the total education chain (from the qualification of *Professional of Human Resource Services* to *Master* degree) and saves time.	This variant builds on the *Professional of Human Resource Services* and allows a simultaneous acquisition of the qualification *Professional of Vocational Training* and the master degree.	This variant is based on the successful completion of the *Professional of Vocational Training* (or equivalent qualifications) and supplements this with scientific content, leading to the master degree.	This variant is highly flexible. Participants can freely choose according to their needs and create their own "study menu".

* *funded by the German Federal Ministry of Education and Research (BMBF) within the funding programme "Advancement through Education: Open Universities"; cf. Brater et. al. (2014)*

The overarching benefits are:

for in-company vocational educators:

- It is possible for them to acquire Higher Education, even without the classic General University Entrance Qualification ("Abitur")
- The model is designed part time (so there is no need to leave their job to study)
- It recognizes prior learning experiences of VET educators
- The integrated projects are from the real work of the VET educators; the acquired knowledge can therefore flow directly into the work (aspect of innovation/professionalization of the own work),
- In combining the different forms of knowledge and skills in action (performance) and by reflecting that it is possible for them to acquire professional competence
- The ways 1 and 2 bring significant time savings and contents do not have to be learned several times anymore
- Overall, a chance for professionalization incl. a corresponding (academic) status

for the companies:

- They benefit from the practical orientation of the training, on the other hand scientific methods find their way into operational practice (change for innovations)

for the Education System in Germany:

- Previously strictly separate areas finally find together (learning in company, at inter-company training programmes in Further Education and university = "trial"). This aspect connects to the discourse of "permeability between VET and academic education" (cf. CEDEFOP 2012).

Besides the linking of the (previously separated) learning environments and graduations, a particular approach of the Alanus University is integrated in the regional configuration of the three branch model: artistic training (exercises and projects in painting, drawing, sculpturing, drama, dancing and music). The assumption here is that art is particularly suited to learn being able to deal with uncertain, complex, open situations and form competencies like reacting spontaneously, to improvise, doing crisis management, to learn sensitivity, empathy and creativity. Successful VET today is not only a question of skills and qualifications, but much more a question of personality. And art is a proven way to aid the process of personality development (cf. instead of many contributions: Brater/Wagner 2010).

(Reflection of) preliminary conditions of success and lessons learnt

The model describes a way of education of VET trainers that seems particularly promising when various institutions of learning and learning places exist and

when the qualification paths and existing qualifications are heterogeneous. If one wishes to transmit such a model in other countries, it might be helpful to take the following experience note:

In particular, the implementation of such a model requires the willingness of all actors to work together. For example, the universities need the will to establish systems for the recognition of prior learning in non-academic fields (including workplace learning) and quality-assured systems for competence assessment and the certification of competencies. The exact design requires an overall intensive communication on the forms, tasks and roles of and in cooperation and the opportunities and restrictions of the involved institutions and actors. Therefore, the testing of these and similar models in Germany was done in regional networks, thus intensive communication and co-working was possible. For the idea of how to establish such networks in Sub-Sahara Africa, see the article of Haseloff in this anthology.

Other lessons learnt of the testing of the model at the Alanus University were that

- the educational outcomes of the own Vocational Education of the participants were high enough to complete an ambitious scientific study courses and to acquire the Master degree
- many regulations and bureaucracy made and make it difficult to link the three branches
- different interests lead to difficulties (university: rather orientation on graduation, regional institutions: rather orientation on economic aspects)
- the practical projects are highly dependent on the policy and strategy in the company
- the Further Education training at the regional institutions must be as innovative and practice-based like provided in the model
- the linking of the learning places can be made possible in the free cooperation of the partners curricular – but it has to be completed it is in the mind of the participants
- different political responsibilities must find a matching.

A difficulty therefore arose from the federal structure of education in Germany. In some federal states of Germany, educational laws allow to access Master Courses, in other federal states this is not possible without acquiring a Bachelor degree first – like it is the case in North Rhine-Westphalia (NRW). First, a gap has been used to allow the access also without a Bachelor degree: with a Bachelor equivalent abroad at the Danube University Krems, it was still possible to access the Master Course. But this gap was filled by amending the law on Higher Education in NRW however. So the continuous path in NRW now requires a Bachelor degree (in a project, the Alanus University is now working on a relevant Bachelor programmes). So while the project was supported and welcomed by the federal government (Bundesregierung), the political action at the federal state (Bundesland) led to problems. Such experiences show the difficulty to implement such models in a complex situation with many stakeholders.

Summary

VET trainers today need different forms of knowledge and skills that could be acquired at different learning places. So they could highly benefit from their systematical integration. Linking models in Further Education, like the one described here, offer systems that allow participants to organize their training activities very flexible and in personalized fit. Participants of such forms of Further Education can acquire professional competence including competence of self-directed (but supported!) learning.

The three-branch-model described here is to give inspirations on how such models can look like and how the strengths and advantages of the different places of learning can be used effectively.

The brief sketch of conditions of success and lessons learnt wants to raise awareness of the complex co-interrelationships and to identify challenges that are not initially in view. The challenges are different in any country, but may occur on similar levels. It appears crucial to involve all stakeholders in 'networked' cooperation.

VET trainers have a major influence on the vocational competence and the forming of personalities of the youth. That is why economy, policy and science have to cooperate on an equal footing to overcome existing obstacles and to ensure a high-class qualification.

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TVET Teacher Further Education: Practice, Experiences and Reflections of Stakeholders in Catholic Sponsored Community Colleges in East Africa

Peter Changilwa Kigwilu

Abstract

A major concern for the industry has been the mismatch between education and skills needed in the job market. In specific, transversal skills have been cited as either inadequate or lacking in the TVET training programmes, a gap that the Catholic sponsored community colleges sought to fill by developing a training programme for TVET teachers. This is a three-year diploma in education programme incorporating transversal skills (Life skills, ICT skills and Entrepreneurship skills) for practicing TVET teachers run in collaboration with Marist International University College. The participants are drawn from community colleges (and other TVET institutions) in Kenya, Uganda, Tanzania and Zanzibar. Adopting the phenomenology research design, the study sampled 30 participants; 8 graduates of the programme, 3 directors, 5 alumni and 14 students of community colleges. A Focus Group Discussion (FGD) was conducted among the students while other participants were interviewed. Pertinent documents to the programme were also analyzed. Using primary and secondary data, the study analyzed the profile of teachers, Further Education model used, experiences of stakeholders, and challenges encountered, with a view to drawing lessons for replication in other TVET institutions. The findings showed that success of Further Education programme depends on adequate profiling of students and alignment of the programme to the participants' needs. None-the-less, Further Education programmes that integrate transversal skills in their curricula and enhance quality teaching result in more favorable outcomes. Finally, robust measures ought to be taken to mitigate the inherent challenges in Further Education mode of training.

Keywords

Community colleges, Entrepreneurial skills, ICT skills, Further Education, Life skills, Transversal skills, TVET

Introduction

The community college concept of education seeks to empower the underprivileged through appropriate skills development that lead to gainful employment in local industry and the community. As a movement that began in USA, the concept was introduced in East Africa in 2006, drawing resemblance to the Indian community colleges, but uniquely aligned to the local realities. The community colleges offer transversal skills (life skills) alongside the technical and vocational courses. The courses, which are basically artisan and craft courses, are identified through a community needs assessment (CORAT, 2011; EACCS, 2006). While some community colleges are funded by the local community, others have external sponsors including Churches and NGOs. This study focuses on those established under a joint initiative of the Catholic Church and Stitching Porticus Foundation, an NGO.

In 2009, the East African Community Colleges Secretariat (EACCS) developed a Diploma in Education programme for training TVET teachers drawn from the community colleges. The programme was launched in 2010 at Marist International University College (MIUC), upon its approval by Senate of The Catholic University of Eastern Africa (CUEA) in 2009. The objectives of the programme were to: (a) provide a sound understanding of life skills education, particularly in relation to current realities in East Africa; (b) empower the teachers to become skilled teachers and educators of life skills; and (c) give them an academic foundation for further studies in the field of teacher education. The expectation was that the graduates of the programme would subsequently prepare their students for self or other employment, everyday living and pursue higher education.

Problem Statement

TVET is considered the engine for propelling economic and technological development in many developing countries. Furthermore, the emerging workplace demands a new set of transversal skills (life skills, ICT skills and, entrepreneurial skills) for employees (Kigwilu, 2016; Bwanali, 2016). This demands of teacher education institutions to incorporate transversal skills in their curricula. However, little has been done to embed transversal skills in most programmes. Moreover, most TVET institutions rely on apprenticeship model of teacher education whereby their students become TVET teachers, devoid of desired pedagogical skills (Changilwa, 2015).

Globally, there is a rising need of teachers with robust pedagogical and transversal skills. Indeed, studies affirm that TVET teachers are inadequately prepared to

discharge the task of curriculum implementation (Hooker et al., 2011; Farstad, 2002; Indoshi, 2010; Wagah, 2010; Agak, 2010; Sharma, 2008; Fietz, 2007; Reglin, 2007; Mouillour, 2007; UNESCO, 2010; Mupinga, 2006; Busby, 2006;Ngatiah, 2006; Ferej, 2012; Kitainge, 2012; Ooko, 2012; Simiyu, 2009). It is against this backdrop that this study sought to establish the gains emanating from the TVET teacher education programme offered at MIUC. In particular, the study sought to:

(i) Profile the teacher participants of the programme
(ii) Describe the education model used in training the teachers
(iii) Analyze the experiences of implementers and beneficiaries of the programme
(iv) Discuss the challenges encountered in implementation and their mitigation thereof
(v) Draw lessons for replication in other TVET institutions.

Methodology

Phenomenology research design guided the study. The study sampled 30 participants; 8 graduates of the programme, 3 directors, 5 alumni and 14 students of community colleges. A Focus Group Discussion (FGD) guide was administered to students while other participants were interviewed. Furthermore, document analyses of evaluation reports of the programme and administrative documents relating to the programme were conducted.

Findings

Profile of Programme Participants

The type of Further Education offered largely depends on the level of preparation teachers receive prior to their entering the profession. This yields four categories of teachers; unqualified teachers, teachers for upgrading, teachers assuming new roles, and teachers for refresher courses. Unqualified teacher is one who has not attended any formal teacher education programme. Teacher for upgrading refers to a trained teacher with lower professional qualification, say diploma qualification, and aspiring to attain a higher professional qualification, say degree qualification. A teacher assuming new roles refers to an already practicing teacher who trains in a discipline or subject that is different from what s/he studied during the initial teacher education programme, and this training leads to a shift in responsibility such as from teaching roles to administrative roles. Finally, a teacher for refresher courses refers to a practicing teacher who undertakes short courses in his/her field of specialization to improve his/her pedagogical knowledge and skills in that field. Table 1 shows that the programme targeted a mix of unqualified teachers, teachers assuming new roles and teachers for refresher courses since none of them had been trained in transversal skills. In addition, the selection of teachers ensured gender parity for all the cohorts.

Tab. 1 Profile of the Teachers

Teacher Profile	Distribution by cohort											
	First intake (2009)			Second intake (2010)			Third intake (2011)			Cumulative		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Pre-training qualifications												
Technical Teacher Education	0	0	0	1	0	1	0	0	0	1	0	**1**
Other qualifications	11	12	23	7	5	12	4	3	7	22	20	**42**
No post school education	2	0	2	1	4	5	2	3	5	5	7	**12**
Total	**13**	**12**	**25**	**9**	**9**	**18**	**6**	**6**	**12**	**28**	**27**	**55**
Nationality												
Kenya	6	7	13	3	2	5	2	3	5	11	12	**23**
Uganda	5	3	8	4	4	8	2	2	4	11	9	**20**
Tanzania	2	2	4	2	3	5	2	1	3	6	6	**12**
Total	**13**	**12**	**25**	**9**	**9**	**18**	**6**	**6**	**12**	**28**	**27**	**55**

TVET Teacher Education Model

The model for training the TVET teachers was an input-output process. This process begins with inputs (students, teaching and learning resources) into the system, which undergo some refining (teaching and learning process) and are then channeled out as outputs (graduates). For this project, the process began with embedment of the transversal skills into the teacher education curriculum. Based on this embedment, appropriate teaching and learning approaches were employed whose effectiveness was assessed both formative and summative resulting in desired programme outcomes. Formative assessment refers to the ongoing assessment of student learning to provide feedback to instructors and students useful for improving teaching and learning. It is usually assessed through such ways as continuous assessment tests, quizzes, assignments, observations and reflection journals. On the other hand, summative assessments are conducted at the end of a programme of project to assess the final product of the programme through final examinations, projects and course evaluations. The input-output model is presented in Figure 1 and each component of the model is subsequently discussed.

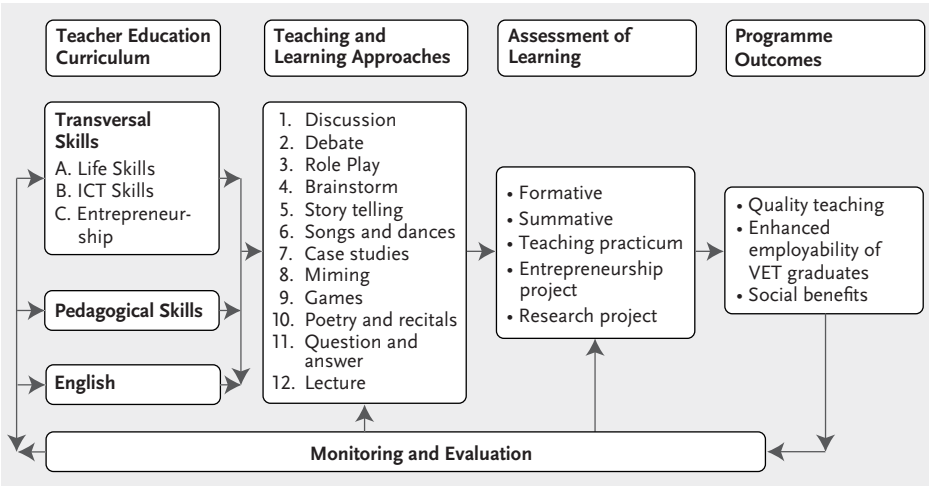

Fig. 1 The TVET Teacher Education Model

Teacher Education Curriculum

The programme was designed to last a minimum of three years (6 semesters) for Form four (or equivalent) graduates and two years for students with relevant post-secondary training. The programme comprised three Common courses, 13 Pedagogical skills courses, 14 Transversal skills courses and seven English courses culminating in an aggregate of 36 courses. Each course covered three credits. The life skills courses were taught by qualified lecturers who had been trained in India.

Of the two main approaches used in embedding transversal skills into training programmes, that is, the integrated approach and stand-alone approach, the programme adopted the latter. The integrated approach fuses the subject explicitly with other subjects across the curriculum or delivers specific topics and content through carrier subjects (Dawe, 2002). As such, it makes learning relevant hence increasing motivation to learn (Shuman et. al., 2005). Although some literature discourses recommend the integration of transversal skills within the curriculum (de la Harpe et al., 2000; Knight, 2002; Yorke, 2002), the approach is associated with diminution of the academic standards (Gunn, 2010; Bell, 2010; Kafmann, 2010). Moreover, the approach seems to insinuate that soft skills are much more difficult to be transferred in practice than hard skills (Laker, 2011; Powell, 2011; Resnick, 1987; Billet, 1998).

In contrast, in a stand-alone approach, the subject is taught as a stand-alone in the existing curriculum (UNICEF, 2012). Globally, there have been shifts from the integrated approach to the stand-alone approach in embedment of subjects especially transversal skills (UNICEF, 2006; KIE, 2008; Chamba, 2009). On the flip-side, the stand-alone approach seems to be less successful than approaches in which desired skills are infused into discipline-specific courses alongside traditional academic content (Lai, 2011).

Teaching and Learning Approaches

There are basically two approaches to teaching or learning; expository, where the teacher exposes knowledge to the learners and heuristic, where learners are encouraged to find information on their own. The programme teaching strategies were grounded in heuristic approaches. These included but were not limited to discussion, debate, role play, brainstorming, story-telling, songs and dances, case studies, miming, games, poetry and recitals, question and answer and project work.

Studies show that interactive learning strategies have more positive effects than didactic approaches (Anderson, 2008; Moore, 2008; Giles et al., 2008; James, 2011; van der Kreeft et al., 2009). Using these methods, teachers assume the role of facilitators of learning, acting as role models to the students. The implication is that teachers must themselves be equipped with (or willing to develop) and demonstrate the same range of effective skills as expected of their students.

Assessment, Monitoring and Evaluation

Transversal skills are assessed continuously using non-traditional assessment techniques such as checklists, peer assessment, teacher observations, presentations and assessment rubrics. This entails both formative and summative assessment. Although the assessment of learning in the programme incorporated the aforesaid techniques, assessment rubrics were minimally used. In addition, client satisfaction surveys were conducted at the end of the teaching practicum. In the surveys, the co-supervisors, who were staff at the teaching practicum sites, provided descriptive analyses of the student teachers in so far as exhibition of transversal skills was concerned. These assessments were eventually summed into four modes and weighted as follows: Continuous assessment (20 %), assignments/group work (20 %), oral presentations (10 %) and end-of-semester examinations (50 %).

The programme was monitored and evaluated both internally and externally. Internal evaluators comprised faculty, student advisors and mentors. They monitored the day-to-day implementation of the programme, identified and corrected weaknesses in the implementation process. External evaluation was conducted by CORAT in 2011, ICDRE in 2012 and KARDS in 2013. The evaluations yielded useful data that was used to improve the implementation of the programme.

Programme Outcomes

So far, three cohorts have successfully completed the programme. In total, 56 students graduated; first cohort of 25 graduated in October 2012, the second cohort of 16 graduated in 2013 and the third cohort of 13 graduated in 2014. In addition, two self-sponsored students graduated in 2015.

The programme graduates work in their respective community colleges and their productivity has been phenomenal. Testimonies from their institutions applaud the pedagogical prowess they demonstrate, the effectiveness they execute in their

teaching and administrative tasks and the transformative touch they give to their students. The foregoing explicates these gains.

In order to understand how the programme had impacted its graduates' pedagogical delivery, both the graduates and their directors were interviewed. The directors attested the centrality of the programme in improving the teaching effectiveness of the graduates. For instance, one director emphatically stated: "My teachers are now very good in imparting life skills to the students. Previously, students disliked the subject but they now like the subject"

Likewise, the CORAT (2011) documents a community college student who demonstrated exceptional performance in her internship. When interviewed, she said that the quality teaching and learning coupled with the ICT skills and life skills acquired enabled her to perform better during internship. The students narrated "...At first I feared. But when I realized that I was even performing better I became more interested in my job. When they saw the way I was working, they kept asking me where I was training and what we were being taught" (p. 11).

Similarly, all the interviewed programme graduates believed that they had received quality training that enabled them to prepare their students adequately for formal employment or starting own business. One of the graduate teachers narrated: "Even though some of our students do not get employed easily, they start their own businesses. One student who finished attachment is underway registering his business. Another was employed in a big hotel! Others got employed in different three star hotels and they occasionally come back to say thank you for the life skills" The same view was echoed by alumni who had been taught by the programme graduates. One of them said: "Life skills education improved my personality. During my job interview, the employer had confidence in me- the way I probably carried myself in the interview ... If it were not for life skills, I wouldn't have a positive attitude to raise my self-esteem".

These findings corroborate CORAT (2011) findings that community college alumni portrayed high self-esteem, had positive attitude towards others, related and communicated effectively. The report further noted that entrepreneurial skills enabled alumni to initiate self-employment projects. An alumna as captured in the CORAT (2011) report said that "with these skills, students can move themselves out of the terrible disease of poverty. For example, one of the girls asked for a loan to start poultry farming upcountry. Within three months she recouped seventy five percent and came to pay back... She has since paid the entire loan" (p. 26).

The social benefits of the programme as shared by students in the FGD included improved interpersonal relations, high self-esteem and self-acceptance, and reduced involvement in social evils such as substance abuse. This is attested to by the excerpts from a director of one community college who said that "With change of behavior from substance abuse to responsible people, students are happy and confident. They experience great healing and self-acceptance ... They are sensitive to the needs of others and come back to us with gifts. They recognize the teachers in public transport and pay their bus fares. This is very touching! I feel like a mother who sees the success of her children as they grow up!" (CORAT, 2011, p. 24).

CORAT (2011) further documents evidence that the programme impacted student behaviour to embrace non-violent conflict resolution mechanisms as a result of acquiring the transversal skills. The report quotes a director who said: " ... having acquired communication skills, our students can now express their grievances to the authorities without being violent" (p. 17). This suggests that the programme had resulted in desired character formation in students.

Reflections

The reflections about the teacher education programme are summed up in the challenges that were experienced and how they were mitigated and the lessons drawn out of these experiences. This is discussed in the subsequent sections.

Challenges and Remedies

The programme faced a myriad of challenges. First, the Teachers Service Commission (TSC) in Kenya does not recognize Life Skills as a teaching subject. Consequently, it cannot employ graduates of the programme. This led to low uptake of the programme. Second, the different entry behaviors (qualifications) of the teachers affected pedagogical approaches used. Third, the mode of learning (school holidays) strained the teachers who already had work exigencies at their respective workstations. Some would not complete off-campus assignments on time. Fourth, the long periods of non-contact with lecturers (about three months) every semester interrupted seamless learning, thereby affecting student academic achievement.

To mitigate the aforesaid challenges, the more knowledgeable students were co-opted as resource persons so that they would feel useful. In addition, lecturers toned their language to the abilities of the least academically endowed students to ensure none was left behind during instruction. Strict adherence to policies on submission of assignments, term papers and other learning tasks ensured timely submission of assignments. In addition, stakeholders embarked on the pursuit for recognition of life skills by the respective governments as a teaching subject. Currently, Kenya's education system is under review and life skills features as a central theme to be embraced in this new education system.

Lessons Learnt

Some of the lessons learnt from this programme include:

(i) Further Education is essential for enhancement of quality teaching in TVET institutions.

(ii) Further Education programmes anchored in pedagogical and other non-technical skills are effective in augmenting the subsequent provision of technical skills to TVET students.

(iii) Practical assessment of knowledge and skills should be at the heart of assessment in Further Education.

(iv) Follow-ups of what Further Education trainees do in their work stations through visits, seminars and debriefing sessions is an effective assessment technique for measuring transversal skills.
(v) None of the embedment approaches of transversal skills is absolutely superior; a hybrid of the two would suffice.
(vi) Spot checks on application of knowledge and skills acquired in Further Education provide information on gaps to loop in thereby strengthening the programme.
(vii) Mode of delivery for Further Education should balance school demands and work exigencies of the targeted group.
(viii) Training of trainers for transversal skills (particularly life skills) is not a field for everyone but rather for only those trained and qualified in teaching the subject.

Conclusions

The following conclusions were drawn from the study findings:

(i) Profiling of students targeted for Further Education is critical for the success of the programme.
(ii) Embedment of transversal skills in the programme was effective in attainment of the programme objectives.
(ii) The programme enhanced quality teaching that resulted in channeling of more productive students into the society with enhanced employability, entrepreneurial abilities and social capital gains.
(iv) Although there were challenges inherent in the mode of learning adopted by the programme, appropriate measures were adopted to address the challenges.

Recommendations

The study makes the following recommendations:

(i) Further Education for TVET teachers should embrace strategies that cater for individual differences due to the heterogeneous composition of the target groups.
(ii) Transversal skills should be embedded in all TVET programmes to equip teachers with adequate skills of molding holistic students who can tackle the social and economic challenges in the society.
(iii) Further Education for TVET teachers should incorporate pedagogical skills as majority of them have not trained as teachers.
(iv) Duration and modes of learning for Further Education programmes should be aligned to the individual needs of the target groups. This calls for more consultation and involvement of all stakeholders in planning process.

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Establishment of a VET-system with focus on Further Education – Presentation of ideas on the motivation and establishment of a Further Education system, especially in universities in Sub-Saharan Africa

Alpheas Shindi

Introduction

Vocational Education and Training has been a topical issue, not only in Sub-Saharan Africa but also in a number of developed and developing countries. This assumption is based on the interest of vocational education training providers and some universities from these countries in presenting and attending Vocational Education and Training (VET) workshops, seminars and fairs. The conference themes and the discussions which ensue, reflect that VET is defined differently from country to country and therefore the VET policies and their implementation are different from country to country. A few examples of these fora are the IVETA (International Vocational Education and Training Association) and the International Congress on Vocational and Professional Education and Training, just to name a few. As for IVETA, it is a network of vocational educators. The network includes vocational skills training organizations, business and industrial firms, and other individuals and groups interested or involved in Vocational Education and Training worldwide. IVETA is dedicated to the advancement and improvement of high-quality Vocational Education and Training throughout the world. IVETA is working to create a new era in communication among vocational educators globe. As for the International Congress on Vocational and Professional Education and Training, it is a congress devoted exclusively to Vocational Education and Training. The main focus is on image building, bilateral exchanges between the private sector and policymakers and the presentation of good practice in host companies

and Vocational Education and Training schools. This backdrop of discussion, presentation and exhibition platform influences and paves the way to a number of VET innovations and agendas.

VET in Sub-Saharan Africa is generally perceived to be for higher education and training while VET programmes are for vocational training colleges and polytechnics. These institutions i.e. vocational training colleges and polytechnics, usually have lower admission requirements than universities. Most vocational training institutions have no links between VET courses and university education. VET in most Sub-Sahara African countries is therefore viewed as a carrier path for those who do not qualify to go to universities. In the last decade a number of polytechnics in Sub-Sahara Africa have changed from polytechnics to technical universities or universities of technology e.g. in Kenya, South Africa, Zimbabwe and Namibia just to name a few.

The last decade has also seen a lot of VET reform in Sub-Saharan Africa. This reform has been influenced countries including and not limited to United Kingdom, Scotland, Germany, Australia, New Zealand and South Africa. Some of the ingredients to facilitate reform have been the introduction of qualification frameworks, industry engagement on training matters, collection of training levy from the industry, refinement of training delivery, assessment and certification as well as introduction of competence based education and training.

VET in Namibia

In Namibia, Vocational Education and Training is considered as one of the priorities for the Namibia government. As a vehicle to articulate VET, Competence Based Education and Training (CBET) was identified and implemented. CBET is hot on the agenda of most Sub-Saharan African countries, though modes of implementation vary from country to country. The key principles of CBET are that the training should be based on competencies and these competencies are specified in the unit standards or occupational standards. Windhoek Vocational Training Centre (WVTC) piloted the development of CBET materials and established a CBET Implementation Unit, in 2001. The selected occupations were Joinery and Cabinet Making and as well as Automechanics. Other Vocational Training Centres e.g. Valombola VTC, Okakarara VTC, Rundu VTC and Zambezi VTC joined the band wagon much later. As more VTC joined, so did the community development centres (COSDECs).

In May 2008 the Namibian government promulgated the Vocational Education Training Act (Act No. 1 of 2008). The provision of the Act is to establish the Namibia Training Authority (NTA), the Board of the NTA and the National Training Fund (NTF):

- to regulate the provision of Vocational Education and Training; to provide for the funding of Vocational Education and Training;
- to provide for the imposition of Vocational Education and Training levy;

- to provide for the appointment of inspectors and designation of quality system auditors;
- and to provide for incidental matters.

The establishment of the NTA birthed interest in having more training providers willing to offer unit standards based qualifications evolve. The present focus of most VET training providers is offering training from level 1 to 5 on the Namibia Qualification Framework (NQF) while levels 6 to 10 are left to universities and other institutions for higher learning. Articulation arrangements are on paper but not practiced, as universities and institutions of higher learning stick to their strict admission arrangements, giving no room for graduates of VTCs who not meet their minimum academic requirements.

Competence Based Education and Training in Namibia

Namibia embarked on Competence Based Education and Training in 2001 through a GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit GmbH) sponsored programme at WVTC. GTZ – Namibia at that time identified CBET as one of the Mega Trends in Technical WVTC set up a department specifically for the introduction, implementation and evaluation of CBET. The department was called CBET Implementation Unit (CIU). CIU followed the procedures of CBET i.e. from generating job profiles up to development of curricula and assessment instruments. GTZ-Namibia supported WVTC through contracting consultants with regional and international experience on CBET.

In January 2003 WVTC trained DACUM (**D**evelop **A** **C**urricul**um**) facilitators to help in the development of job profiles. DACUM is one of the methods used in the development of job profiles. This method is quite popular in Sub-Saharan Africa. Its principles are anchored on using industry job incumbents to develop their job profiles. This job profiles describe the work carried out by job incumbents in a form of a matrix of duties and tasks. After the DACUM facilitator training, some of the facilitators were contracted to develop job profiles. The job profiles developed by these facilitators were as follows:

- Bricklaying and Plastering
- Joinery and Cabinet Making
- Automechanics
- Welding and Fabrication

Upon completion of the job profiles, CIU started developing unit standards for Automechanics and for Joinery and Cabinet Making. The unit standards were from level 1 on to level 3. This meant that there was a void on the levels for the two occupations to articulate to Polytechnic's entry requirements, as most Polytechnic's courses at that time were starting at level 5 on the NQF. In September 2004, GTZ pulled-out its support to the VET sector and WVTC could not sustain CIU. In October 2004 a project called Programme Management Unit for the Establishment of the Namibia Training Authority (PMU-NTA) was formed. It

was in the Ministry of Education reporting directly to the Director, Directorate of Vocational Education and Training. WVTC then handed all the materials developed by CIU to PMU-NTA.

When PMU-NTA took over the draft unit standards, they developed the related qualifications and submitted them to the Namibia Qualifications Authority (NQA) for registration on the NQF. The next stage was to develop curricula and assessment tools. This next stage called the PMU-NTA to go on a capacity development drive to train curriculum developers, module writers and test instrument writers. Along the same timelines, PMU-NTA contracted a South African company to train and certificate assessors and moderators. Polytechnic was also approached to assist in conduction the instructor training programme. As these development activities were taking place, PMU-NTA identified training providers interested in offering the CBET courses. The results were overwhelming, as both private and public training providers were interested in offering these CBET courses.

The overwhelming glut of request to offer CBET courses caused the PMU-NTA to indiscriminately recruit prospective institutions without checking on capacity and capability of these training providers, as well as the capacity of PMU-NTA to deliver the required quality training materials and quality assessment tools and instruments. The negative effects were felt in the second and third year after delivering the first level programmes. Issues of poor quality training materials, poor assessment instruments and procedures started to surface. The pass rate of the student on the CBET courses was not very encouraging and this was a major concern. Some trainees cited that the CBET courses were inferior and the previous modular courses there were being offered before and as a result this was affecting their Further Education and training with other higher institutions of learning. There was a big furore from trainees in a number of VTCs as they requested to have the CBET courses stopped and discontinued. Following this mass demonstration, some VTCs discontinued offering CBET courses.

These disturbances called for CBET implementation to be investigated. The investigation pointed out those major irregularities. In 2008 the NTA was established. In 2010, the NTA hosted a CBET review workshop to discuss the CBET Implementation problems and possible solutions and their side effects. The workshop resolutions shaped NTA's strategy to refine CBET implementation. NTA went back to the drawing board and implemented some of the workshop resolutions. This process bought NTA sometime in redressing its stakeholders' plight. In 2010 trainees came up with more demonstrations and disgruntlements. This prompted the NTA to conduct a study of how CBET was being offered and possible solutions to the problems dogging the NTA. The study was commissioned in 2014 and concluded in 2015. The key findings from the findings are as follows:

- While the NTA will be responsible for the quality assurance of all qualifications, the development and maintenance of vocational qualifications will largely be outsourced to specialist qualification developers working in collaboration with the relevant Industry Skills Committee.

- All vocational qualifications will include a compulsory set of technical, occupation-specific unit standards in Mathematics, English and Science. All qualifications at NQF levels 3 and 4 will also include an optional strand comprising unit standards in generic Mathematics, Science and English that align with the NIED programmes at Years 11 and 12.
- All new qualifications will be accompanied by two key supporting documents. These are a list of the essential resources and equipment required to deliver the qualification and a model-training programme for off-the-job training providers, such as Vocational Training Centres (VTCs) and community training centres, such as COSDECS, which shows how the qualification and associated unit standards may be translated into off the job, competency based training programmes, which include a period of job attachment, where relevant.
- The NTA will no longer produce or distribute support materials and the sourcing and/or production of support materials, including training manuals, internal assessment tools and curriculum, should be the responsibility of the training providers. Providers may choose to develop their own products or work in collaboration with other providers.
- The NTA will provide a 'minimum support package' for all vocational qualifications registered on the NQF. The 'minimum support package' comprises a list of training resources, including instructional material and essential equipment, to support the delivery of the qualification and a model-training programme that sets out how the qualification may be delivered in an off-the-job training context, including a period of job attachment.
- Under the proposed arrangements, assessment will be progressively devolved to NQA accredited training providers with the NTA being responsible for quality assuring these providers and developing the relevant national assessment tools.
- NTA Assessment and Certification Division will take responsibility for assessment, quality assurance and the provision of assessment services, including RPL, which will be offered through the NQA accredited training providers. In some cases, these providers may simply deal with their own trainees, whereas in others they may operate as assessment centres providing assessment services to a range of clients, including other training providers.
- The new assessment arrangements will include a system of graded assessment that will recognise higher levels of candidate performance.

It is expected that with this new dispensation, CBET implementation will be harmonised and university and other institutions of Further Education and training will be able to take-up trainees from VTCs, COSDECs and other training providers offering Technical and Vocational Training (TVET) training programmes below level 5 on the NQF.

Higher and Further Education

In Namibia in general there seem to be a perception that higher education is only offered at universities. As a result this notion has polarized the school leavers to consider university education as a first choice and TVET as a second or third choice. This perception is also shared with the parents and unfortunately some industries. For as long as this thinking reign in the minds of the youth, the attitude of trainees in VTCs, COSDECs and other technical training institutions would be difficult to mould. Some trainees belittle these training institutions, considering themselves as transiting and awaiting for admission to universities. It does not matter how much it is preached to the trainee that at the end of the training they will be employed or will start their own company and contribute to the economy, the trainee would be adamant and continue focussing on the university.

Universities on the other hand are not creating pathways for VTCs, COSDECs and other technical training institutions graduates to be admitted for Further Education. Engineering courses can be a glaring example where principles in the first year of university are the same principles in level 2 or level 3 in TVET programmes. Surely it does not make sense to labour a trainee, now student, to repeat what he/she would have done and passed. Recognition of prior learning (RPL) or exemptions should certainly be considered.

It is always interesting to see technocrats point fingers at each other and play a blame game when it comes to issues mentioned above on articulation. VTCs blame the universities that they do not provide pathways for their graduates while the universities say the VTCs graduates are weak in mathematics, science and other subject or modules. In this "tug of war" it is the trainee who is disadvantaged. It is advisable to create collaborations and synergies right from the development of curriculum. A project called Promotion of Vocational Education and Training (ProVET) assisting the NTA in a number of initiatives has been working with Polytechnic now NUST on development of unit standards and qualifications. This has worked very well and notable giant steps have been noted in two occupations namely Solar Installation and Maintenance as Well as VET Trainer and VET Training Manager. This cooperation is still going to continue in curriculum development and assessment instrument development. Unfortunately, there were no such success stories in Health and Safety, Firefighting and Rescue Operations. In these occupations, the relevant faculties insisted that the education and training is different and should remain separate.

Recommendations

A VET system cannot function well when one or more of its components is missing or not operational. The components of a VET system includes and is not limited to:

- Basic education (Primary and Secondary)
- Pathways (From VTC to work or to Polytechnic; From Polytechnic to work or to university)
- Tertiary education (Apprenticeships and Traineeships) and articulation arrangements
- Job attachments
- Industry engagements
- Conduct research in:
  - Labour market e.g. "skills for jobs"
  - Tracer studies of students and trainees
  - Training delivery, assessment and certification as well as quality assurance arrangements
  - Regional or Sub-Saharan qualification framework

A well-functioning VET system is not a one size fits all, it is contextual. It varies from country to country and also from institution to institution. Therefore there is need to:

- Continue dialogues and share success stories
- Copy, paste and adjust
- Develop and implement policies in VET
- Evaluate implementation and continuously improve
- Establish networks and twinning between institutions in Sub-Saharan.

The Challenge of Contextualization and Domestication of VET Reforms for Higher Education Staff Capacity in East Africa

Winston Jumba Akala

Summary

This paper examines the misty state of VET reforms in East Africa comparing how the perspectives of contextualization and domestication in Kenya, Uganda and Tanzania have impacted on Higher Education policy and practice in the region. Vocational and Technical Training are not a new phenomenon in East Africa. They had been a valued way of life for the African indigenous communities for many centuries until the advent of formal Western education. When colonial administration took charge in Africa in the second half of the 19th century, the modes of Vocational education and Training were thus significantly disrupted and/or modified. Technical and Vocational/industrial skills became associated with race by classifying them as suitable for African communities. All these are among factors that still ripple in today's effort to reform VET in East Africa. The East African countries of Kenya, Uganda and Tanzania have endeavoured to contextualize and domesticate the various aspects of curriculum as a strategy to reform VET. The inter-University Council for East Africa (IUCEA) was therefore founded in the year 1999 by the three countries to coordinate and regulate Higher Education in the region to ensure not only the quality but also to advance Vocational education and Training capacity at this level. However, in spite of there being a clear structure for collaboration in Higher Education for East Africa, IUCEA has concentrated largely on academic research and quality assurance with scarce attention to reinvigoration of VET in Higher Education. Accordingly, there is need to re-conceptualize and rejuvenate VET programmes in East Africa. This paper proposes continuous research and needs assessment among other measures to inform policy formulation and development of practical guides on how to enhance higher Vocational education and Training. This will help to fortify the already flourishing institutes and colleges with specific curricula for many crafts ranging from metal work, electronics, electricity, mechanics,

plumbing, carpentry, tailoring, and catering, among others. The significant challenge is nevertheless the funding and ailing nature of middle level Technical and Vocational Training institutions. This situation poses the challenge of quality and how higher Vocational and Technical Training can be anchored. This paper concludes that significant focus and emphasis on domestication and contextualization of VET in East Africa is likely to unlock the potential of this type of education in re-engineering homegrown industrialization in the region.

Introduction

Vocational and Technical Training are not a new phenomenon in East Africa and Africa as a whole. The apprenticeship model of VET is as old in Africa as the African communities themselves. It involved learning different crafts and skills on the job. Accordingly its entrenchment and contextualization to the uniquely different cultures and realities gave birth to conflict relating to appropriateness of crafts, pedagogies, and management. It split cultures between nation states that proceeded to pursue their own – often different – educational and political ideologies, disrupting indigenous VET systems. Furthermore, Technical and Vocational/industrial skills became associated with race by classifying them as suitable for African communities. Consequently, this school of thought advanced by the Phelps Stokes Commission in 1924, and implemented in Africa led to negative attitude towards VET. All these are among factors still ripple in today's effort to reform VET in East Africa.

Consequently this paper navigates the misty state of VET reforms in East Africa comparing how the perspectives of contextualization and domestication in Kenya, Uganda and Tanzania have impacted on Higher Education policy and practice in the region. The East African countries have made some steps to entrench the various aspects of VET in their curricula as a strategy to reform VET at the university level. The outcomes have been a bag of mixed and sometimes confusing policies and curricula. This paper comparatively and critically explores the ways VET policies, their implementation and the struggle to contextualize and domesticate have influenced the development of VET policy in East Africa, especially at the tertiary and university levels.

Technical and Vocational Education and Training (TVET) in Kenya

In Kenya, the Ministry of Education Science and Technology has three distinct sectors with clearly designated functions: Basic Education, Vocational and Technical Training, and Higher Education. Each of these sectors is headed by a permanent secretary referred to as *Principal Secretary*. The Vocational and Technical Training sector is clearly detached from the Higher Education aspect already indi-

cating that there is disconnect between the two sectors. Accordingly, the nexus between the two sectors is yet to be seriously fathomed and initiated in Kenya.

Currently, the universities set their own criteria regarding which Vocational and Technical Training qualification they would admit to Higher Education. Most of them are then admitted to Technical University of Kenya, Technical University of Mombasa, Masinde Muliro University of Science and Technology, Dedan Kimathi University of Science and Technology, and University of Nairobi. Here, they study academic courses such as Engineering (including Mechanical, civil, electrical, and electronic), building and construction, water, and mining technology, as well as chemical and petrochemical Engineering. The most spectacular aspects in these programmes are as follows:

- The programmes are extremely academic
- They are taught and supervised largely by faculty who have a strong tradition in the academic genre or track of education
- Since the Technical universities in Kenya are relatively young, 90 % of faculty in them come from a purely academic tradition
- The students from the Technical track learn together with those from the academic track in an integrated fashion; in spite of their distinctly different backgrounds.

Furthermore, some of the Vocational and Technical institutes offering certificate and diploma programmes in Kenya are not accredited by the Technical and Vocational Education and Training Authority (TVETA). As a result, the qualifications from these institutions are not recognized by universities that register VET graduates in largely academic programmes. For instance, in the year 2013, TVETA closed eight Technical institutions in Nairobi because they failed to meet the standards set by the TVET Act 2013. What is intriguing though is that TVETA as a regulatory body for VET in Kenya does not have any mandate to regulate university education! This function is independently carried out by the Commission for University education, which is extremely academic in its approach.

As a result, Vocational and Technical Training is neither the tradition nor the practice in what have been christened Technical universities in Kenya. The curricula in these universities have been largely borrowed from the incubating universities. For instance, the Technical University of Kenya, which until 2012 was a constituent college of the University of Nairobi, has borrowed significantly from the academic curricula run by the university.

As a matter of fact, these universities ferociously pursue the academic tradition bequeathed by their mother universities. The net effect is that there has not been any interest to innovatively develop new curricula to emerge with new Vocational and Technical oriented degree programmes at the Technical Universities. Furthermore, the Master and doctoral programmes at the universities are extremely academic leaving limited space and interest to capacity building for staff teaching in areas of Vocational and Technical Training.

Business, Technical and Vocational Education and Training (BTVET) in Uganda

In the Republic of Uganda, the Ministry of Education and sports is divided into six autonomous institutions one of which is the Directorate of Industrial Training. This arm of the ministry manages Vocational education and Training which offers a total of 35 Training programmes leading to production of artisans in the 35 different areas. None of the listed VET specialty areas is implemented at the higher university level from the VET perspective. As a matter of fact, the graduates from these programmes are not admissible to mainstream engineering or other professional areas of Training because these positions are filled by the applicants directly emerging from schools that run academic curricula.

Uganda's education structure comprises of 7 years at primary school level, 6 years at secondary level (divided into 4 years ordinary level and 2 years advanced level), and 3–5 years of tertiary and/or university education. There is also a three year VET programme rolled out in 2014 that caters for students who terminate their education at the ordinary secondary level. The VET programmes are handled under the sector referred to as Business, Technical and Vocational Education and Training (BTVET) which regulates VET activities and institutions at all levels of the education system. However, a scrutiny of the actual colleges and institutes regulated by this entity reveals that the mandate does not cover university level education, which is handled by the Uganda National Council of Higher Education (UNCH).

Vocational Education and Training (VET) in Tanzania

In Tanzania, Vocational education and Training is regulated by the Vocational Education and Training Authority (VETA) founded by an Act of Parliament No. 1 of 1994. VETA is charged with broad responsibility of coordinating, regulating, financing, promoting and providing Vocational education and Training in Tanzania (VETA 2016). VETA runs 27 Training centres and institutes in different parts of Tanzania and coordinates more than 600 private VET colleges and institutes countrywide. The institutions provide courses such as tailoring, masonry, carpentry, catering, plumbing, art and design, among others. VETA also carries out regular baseline and needs assessment surveys to determine the market situations in order to inform VET curricula and policy. For instance a special VETA report on achievements during President Jakaya Kikwete's regime reveals:

> *"To enhance employability of VET graduates, VETA continued to provide quality Training focusing on the demand of the labour market. The Tracer Study conducted by VETA in 2010 established that 66.1% of VET graduates were employed, whereby 43% of them had wage employment, 50% were self employed while 7% were employed without pay." (http://www.veta.go.tz/index.php/en#)*

A significant chunk of these achievements was achieved with additional support from GTZ, which made contribution to similar programmes in Kenya and

Uganda. However, in spite of the great strides made in VET programmes, VETA neither regulates nor coordinates higher Vocational and Technical Education rendering capacity building for teaching at the various institutes difficult.

Implications for Higher and Further Education in East Africa

The inter-University Council for East Africa (IUCEA) was founded in the year 1999. Among its objectives was the need to facilitate establishment and maintenance of internationally comparable education standards in East Africa so as to promote the region's competitiveness in Higher Education. However, in spite of there being the a clear structure for collaboration in Higher Education for East Africa, IUCEA has concentrated largely on academic research and quality assurance with scarce attention to reinvigoration of VET in Higher Education. As a result, the following realities now dominate the situation in Higher Education:

- Prevalent apathy towards Vocational and Technical education abounds which dates back to colonial era when Technical and Vocational skills were taught only to Africans. During that time, academic and professional fields were reserved strictly for the people of European and Indian decent (Sifuna & Otiende 1992). As a result, it is believed that students who fail to secure admission directly to university academic curricula are the ones required to join VET programmes. This has an underlying implication that they are not suitable for the rigors of university education.
- There is limited evidence of clear policy on development of VET in the East African countries. Even within each country, issues relating to VET are managed by several autonomous sectors whose policies sometimes conflict, especially those governing tertiary and Higher Education.
- Country-based initiatives remain largely academic with limited evidence of innovative VET curricula and practice.
- A look at the curricula covered in VET/TVET programmes reveals that there has hardly been any attempt to contextualize crafts and technologies to the Eastern Africa resource base and needs. Only in very limited circumstances one finds architectural designs and artistic impressions that are founded with the African realm. What remains unclear is whether the insatiable appetites for exotic perspectives is responsible for limited interest in domesticated and contextualized versions.
- The curricula also barely domesticate VET by developing and emphasizing the valuable indigenous technologies as reflected in the diverse cultures of Eastern Africa. The only situation where indigenous technologies can be observed is in Technical and architectural drawings that result in construction of buildings with some semblance of African culture.
- Distinct sectors handling Technical and Vocational Training at the tertiary levels operate autonomously granting terminal diplomas and higher diplomas

without any collaborative strategy with universities on how to provide further Higher Education in a commensurate VET approach.

Way forward in re-engineering VET in East Africa

In order to move to new heights in developing VET, there is need to re-conceptualize and rejuvenate VET programmes in East Africa. A baseline study in East Africa and perhaps the entire African continent is necessary in order to determine the status of VET with a view to developing policy framework to guide the following:

- Development of curricula for Further Education in the different special areas of VET
- Determining the nexus between modern VET content and methodologies on one hand and indigenous African lifelong learning skills and technologies on the other (Nyerere 1967; Akala 2006).
- Contextualization of technologies to local needs and realities. This can be achieved by ensuring that the technologies with strong western background are juxtaposed with indigenous African craft technologies with a view to creating hybridity. Perhaps this would then attract local African interest.
- There is need to review the mandates of the different sectors in the Ministries of Education in East Africa to emphasize closer interaction and sharing to ensure that cross-cutting educational issues especially between the middle level VET colleges and institutes are adequately represented in a VET track at the universities.
- Create model Technical and Vocational Education Training centres of excellence at universities with a view to turning them into centres of innovation in VET.

Conclusions

Already quite a lot has been done in developing VET at the middle college level in East Africa. A colossal number of institutes and colleges already exist with specific curricula for many crafts ranging from metal work, electronics, electricity, mechanics, plumbing, carpentry, tailoring, and catering, among others. However, the achievement of VET initiatives and programmes at middle level Technical Training and polytechnic institutions in East Africa will certainly remain a mirage as long as ingenuity, contextualization and domestication remain alien. Innovative strategies targeting the development of curricula that focus the need for Further Education on one hand and collaboration especially with Technical universities in the region are likely to change this trend and reinvigorate the quality of higher and Further Education in the various VET specialties. One innovative strategy that bears the potential to change trends is needs assessment and capacity building for the predominantly academic faculty at the various universities to enable them to review their curricula to accurately focus the Higher Education needs of the graduates from Technical Training institutes and Vocational Training colleges in East Africa.

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Session 3

What are concepts or conditions of success for a networked VET learning and teaching (oriented on competence, working practice, flexible, etc.) and especially for a networked Further Education system in VET?

Following the theoretical approaches of sessions 1 and 2, session 3 presents ideas and models for Further Education concepts that were tested in practice. They come from nine African universities and one German university. The authors provide supportive and obstructive factors for competence-oriented Further Education in VET.

The keynote for session 3 is on *Short cycle Higher Education programmes for Further Education of VET practice skills trainers*. **Piet Lem** from **The Netherlands** discusses alternative methods of Further Education for VET teachers.

In her presentation on *Understanding the English subject offered in the South African Technical Vocational Education and Training Colleges and its implications for the curriculum delivery,* **Mary Madileng** from **South Africa** outlines the importance and difficulties of designing a VET curriculum for English as a subject.

The relevance of partnership and links between university and TVET is the topic of **Esayas Alemayehu's** essay *A Review on TVET Programmes in **Ethiopia**: An Experience in Biomedical Technician Education*.

Daniel Dinis da Costa from **Mozambique** identified the mitigation of influential factors in running VET education in his work *From "the Chicken to the Egg" Technical-Vocational and Informal Training Story to Industry's Manpower, What Comes first? A Philosophical Study.*

How can competence-based assessment work in the African context? asked **Ethel Kyobe** from **Uganda** in her presentation *The concept of Competence Based Assessment in Vocational Education and Training.*

Christoph Bohne from **Germany** writes in *Shaping and Networking with Digital Media in Further Education: Strategic and Conceptional Considerations* about the importance of digital media in VET.

The article by **Nothemba Joyce Nduna** from **South Africa** – *Promoting effective WIL and RPL practices in the TVET Sector through Research* stresses the integration of research in VET education.

In *Learning and Exchange Platforms – An approach to professionalizing,* **Silke Partner** propounds that vocational educators should be trained through project-based learning. Partner stresses the importance of a multilevel national dialogue with all interest groups in **Namibia.**

In *Teachers Understanding of Entrepreneurship Education in Malawi*, **Feggie Mphasi** reports on her research into entrepreneurship at secondary schools. She concludes that entrepreneurship should be given more space in schools and on the curriculum, while teachers should be better prepared for this issue.

Gabriel Konayuma describes in *Design of current TVET system in Zambia* the structure of TVET in **Zambia**, emphasising the importance of Further Education in VET. This is the only way to guarantee the necessary quality in TVET training.

In *Competency Based Education and Training for the Training of Trainers,* **Lance Hauuanga** comments on competency-based education and training for trainers in **Namibia**. He sees TVET as an engine for transforming the Namibian economy. According to Hauuanga, the competence-oriented training programme and curriculum presented in the article lays the necessary foundation.

Key factors in the further development of VET systems are the professionalisation of vocational educators and curriculum development, says **Eric Wendkouni Sawadogo** in his article *Professionalization of Multipliers and curriculum development in VET system: Results of Survey, Practice and Challenges in Burkina Faso, Senegal and Germany.* Sawadogu tested a new, flexible model in **Burkina Faso** and **Senegal** that also includes the informal sector.

Guiseppe Tacconi and **Adula B. Hunde** study the professionalisation of TVET teachers in **Ethiopia** in their article *Professionalization of VET teachers in Ethiopia – the current practices, challenges and the way forward.* They recommend including internships in companies in the curriculum for VET teachers. The collaboration between universities, colleges and industry could form the basis for such a model.

Short cycle Higher Education programmes for Further Education of VET Practice skills trainers

An attractive alternative for VET trainers

Piet Lem
Fons Dehing
Cornelis van Dorp

Abstract

Although in the Netherlands the bachelor level (EQF-6) is required for teachers at VET schools, part of teaching staff does not meet this qualification, as a significant part of the practical skills training is provided by instructors, senior experienced technicians (EQF 4) without substantial further pedagogical or technical training. This development illustrates the complex dilemma with teaching staff in VET. On the one hand, we have the bachelor teacher who is theoretical educated for the engineering profession and consequently has (too) limited practical skills for the vocation. On the other hand, we have the skilled experienced technician from industry, who is vocationally skilled but has (too) little pedagogical knowledge. Upgrading the instructors in a Further Education programme to the level of teachers is preferable but proves to be difficult as instructors are not always eager or capable to do so.

An education level between the teacher (EQF 6) and the skilled technician (EQF 4) could be a feasible solution, not only to upgrade trainers in vocational education to a Higher Education degree and to improve pedagogical and didactical competences, but also to be able to differentiate between educators of different levels of pupils (huge differences in pupil capabilities in vocational education require different educational approaches!).

Both teacher training institutes and VET schools identified the EQF level 5 as an adequate level for Further Education of these instructors. Level 5 course duration typically is 2 years and offers a more feasible solution for both employers and instructors. The teacher training institute for technical teachers at Fontys University

of Applied sciences has developed the course with main characteristics: combined work and study, dual, and competence based. In this paper we report on the background and development of and experiences with this Further Education course for VET-trainers on this EQF level 5.

Problem statement [1]

Like in many European countries, the Dutch labour market requires more technicians while student enrolment in primary and secondary technical vocational education decreases At the same time, the teacher education system has difficulties in responding as the number of new educational staff does not keep pace with the retirement of old staff. In addition, the system demonstrates difficulties in developing improved educational and pedagogical preparation of teaching staff for pupils at the different levels of vocational education who require more specific care.

Although in the Netherlands the bachelor level (EQF-6) is required for teachers at VET schools, part of teaching staff does not meet this qualification, as a significant part of the practical skills training is provided by instructors, senior experienced technicians (EQF 4) without substantial further pedagogical or technical training.

This development illustrates the complex dilemma with teaching staff in VET. On the one hand, we have the bachelor teacher who is theoretical educated for the engineering profession and consequently has (too) limited practical skills for the vocation. On the other hand, we have the skilled experienced technician from industry, who is vocationally skilled but has (too) little pedagogical knowledge.

Upgrading the instructors in a Further Education programme to the level of teachers is preferable but proves to be difficult as instructors are not always eager or capable to do so.

An education level between the teacher (EQF 6) and the skilled technician (EQF 4) could be a feasible solution, not only to upgrade trainers in vocational education to a Higher Education degree and to improve pedagogical and didactical competences, but also to be able to differentiate between educators of different levels of pupils in vocational education.

1 Although the development described in this paper is linked to the Dutch VET situation and to the European Short cycle level-5 developments, it can be relevant for other VET systems too. This paper offers a number of notions for a wider application and discussion: First, the importance of providing appealing programmes (with feasible study horizon, enable career planning, status within the VET-teaching staff) that attract (senior) technicians from industry to become VET educators. Second, the design of training programmes for VET-educators aiming at lifelong learning. Third, differentiation in competencies in VET teaching staff, to establish a full spectrum of competencies for different levels of pupils. Fourth, to develop a clear national (or international) competence framework which provides competence descriptions for VET educators. Such a competence framework can contribute not only to a clear programme (and differentiations of programmes) for training VET-educators but also it contributes to a more relevant programme which includes needs of industry, pupils and educators. Last, but not least, the notion of the absolute required collaboration of VET-training institutions with industry as it can connect both closed worlds. Collaboration can contribute to overcome preservation of institutional independence to achieve a constant consideration of the needs to update programmes to ensure a better response to economic developments and needs.

Differentiation in teaching functions in VET school

In Dutch secondary vocational education, pupils (age 14−18) are prepared for a wide range of occupations. The demand for skilled workers on all levels is expected to increase. To meet pupils differences in developmental capacities, courses prepare four different training levels − equivalent with the EQF −, leading to a specific job qualification. The levels are: 1) assistant training; 2) basic vocational training; 3) professional training, and 4), middle-management training. The courses take up to four years (level 4). The level 1 and 2 pupils are perceived as vulnerable, often special needs pupils, and therefore they require a special pedagogical and educational approach. Groenenberg and Hermanussen (2012), call teaching level 1 and 2 pupils 'a special art'. Consequently, not all of student teachers are capable, willing or ready to work with these groups as the focus is mainly on practice training instead of teaching technical concepts. In secondary vocational education, approximately 50 % of the pupil population is mainly a practice trainer domain group (EQF level 1 and 2) and the remaining 50 % is typically a 'teacher domain' group (EQF level 3 and 4). So, the huge differences in pupil capabilities require different educational approaches! Given the specific characteristics of the pupil population in VET education, the question can be asked if bachelor teachers should be the only applicable staff for all groups of VET pupils. In fact, the value of the instructor in this sense has already been recognized. But also their deficiencies in pedagogical and didactical competencies compared to teachers have been recognized.

Recently, employers in education and the government have agreed on widening the spectrum of teaching professions beyond the current dichotomy of instructors and teachers. The Associate degree level (EQF 5) became available as intermediate teaching qualification: the practice trainer. The practice trainer for the lower level vocational students is characterized by strong pedagogical competences and with an understanding of, and an open mind to, the needs of these pupils. The practice trainer is a technically and pedagogically skilled and devoted educator who can make a difference. Moreover, the development and implementation of Associate degree programmes improve the flexibility of the Higher Educational system in supporting Further Education in VET and lifelong learning in Higher Education.

Towards an associate degree programme (EQF-level 5) for practice trainers

In 2013 after a pilot period of 5 years, the EQF level 5, the so called 'associate degree' became part of Dutch Higher Education system facilitating teacher training institutes to develop a Higher Education programme for training of practice trainers in VET schools. On the national level, the learning outcomes of the associate degree in education have been defined as a subset of the learning outcomes of teachers.

Already for many years, the technical teacher training institute of Fontys University of Applied Sciences has been collaborating with VET schools (senior secondary vocational education) in the Further Education of instructors. The development of an associate degree programme was a natural next step. The instructors programme is pedagogically and didactically focussed. The instructors are not technically further trained as they mainly perform as instructors with groups of pupils in practice training situations in close collaboration with and under supervision of the teacher (Lem, P., Laar, R. van de & M. van de Ven, 2008). Although of great value, these instructors are not officially certified, and the status within the teaching staff in many cases is not very high; they are often considered as 'helper'. The reality, however, is that the instructor has a lot more responsibilities than just 'helping' the teacher. They focus on developing, preparing and carrying out educational programmes in practice situations, on and off the job. In many cases they have a great responsibility in teaching practice skills and in pedagogical guidance. So, the instructors experience a large degree of uncertainty about their role and tasks. According to Adams (2013), this confounds the professional identity of these educators and affects the recognition that instructors are afforded for their role. Role recognition appears to be key to building professional identity. The development of a clearer professional identity is essential if educational preparation is to be tailored more specifically to the needs of those undertaking a practice trainer role.

In contrast of the instructor programme, the associate degree programme for practice trainers aims at both pedagogical and technical further training. In addition to this higher level, the programme also aims at improving the positioning of the practice trainers in schools. Clarification of the roles and tasks of the practice trainer contributes to a necessary mind shift (Figure 1): 'thinking out of the hierarchical box' towards a perspective of an education team with relevant educators, all with their own specialties and all together focused on the development of the pupil.

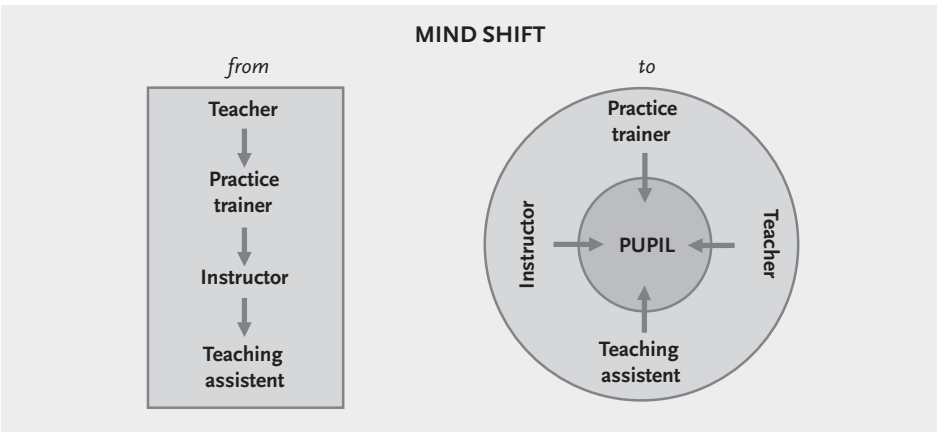

Fig. 1 A mind shift in professional identity

For the Further Education in VET, this new associate degree programme (Ad.) offers an achievable study horizon in the sense of an acceptable time frame and also an opportunity for dual, competence based learning. However, it doesn't mean it is an easy job for VET instructors to complete this Further Education route. On the contrary, many of them (like Hans and Rob, see intermezzo), have to re-invent studying! The Ad is a Higher Education programme which demands high levels of studying texts and writing papers, of conceptual thinking, of working in groups, of doing practical research etc. As developers of the programme, in all the enthusiasm and plea for lifelong learning, we must underline the importance of the programme design. Knowledge bases, competences, curriculum: it is only one part of the design. An even more demanding part is the design of a 'safe, warm bath' in which the adult student does not drop out of the 'new life of continuing learning'.

In figure 2 the Ad is positioned in the educational possibilities next to the bachelor.

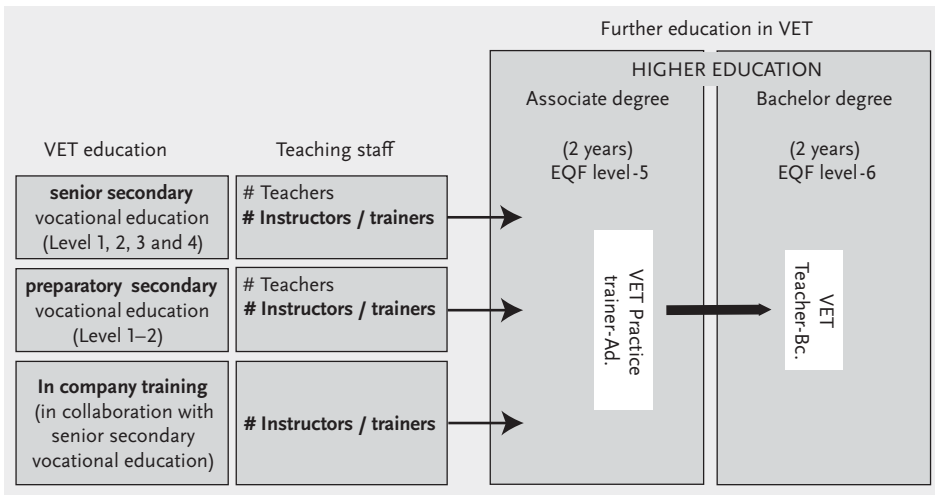

Fig. 2 Further Education possibilities for VET educators

Intermezzo: The further education for VET trainers Hans and Rob

Hans, a 34 year old technical trainer at a big shipyard in the Rotterdam area is a professional welder. He trains personnel in welding. Also he trains, guides and supervises pupils from a senior secondary vocational school in their internship at the yard. The company is very eager to have higher qualified in-company training personnel. Also, the senior secondary vocational school in their expanding collaboration with companies prefers working with qualified colleague educators within those companies. A few years ago, Hans, as an unqualified trainer, wanted to attend the engineering teacher training programme. Both for him and for the company, the Further Education programme was not very appealing. Except from the duration (4 to 5 years), it also was not clear if Hans could hold up with the bachelor level.

In September 2015 Hans started the level-5 Higher Education programme to become a certified engineering practice trainer. In July 2016, Hans completed the study with a diploma.

There is an interesting thing happening now. Hans is seriously considering the Further Education of the engineering teacher programme. The level-5 associate degree allows him without constrains to continue his Further Education into the bachelor programme. He has in a way re-invented himself. He discovered that he is able, willing and ready for continuing learning. What is more, he discovered that continuation offers him even more career possibilities in both the company and the VET school. For Hans, the continuing study has become less risky. After all, he has a diploma on level-5!

Rob is a 49 year old colleague student of Hans and works as an electronics instructor at a ***preparatory secondary*** *vocational school. A couple of years ago, Rob attended the course for VET instructors at Fontys. Because this is not an official Higher Education diploma, the schools puts pressure on Rob to further educate himself as a practice trainer. Rob never wanted to become a theory teacher. He loves his job with the kids in the practice setting of the learning process. Rob is a great pedagogue. Rob is married and has 5 children. The level-5 programme is a great opportunity for Rob within his possibilities and motivation to become a certified practice trainer in his VET school. For him, just like for Hans, the 2-year programme offers a viable horizon. Also Rob succeeded in July! For now, he is not ready to continue in the teacher training. Maybe he never will.... But, even after a few years he has the opportunity to step into the bachelor programme.*

The development and implementation of a pilot Ad-course for practice trainers

With the development of Ad, we aim at solving the dilemma on teaching staff. We have bachelor teachers for the theoretical subjects and the upgraded skilled engineering technicians from industry for the vocational skills training.

Next we describe the pilot Ad-course for practice trainers. The course was developed by the teacher training institute of Fontys University of Applied Sciences in cooperation with regional VET schools. The description is in terms of design requirement, course design and implementation and evaluation.

Design requirements

We concluded that the further training for instructors to the level 5 practice trainer should respond to the needs of the educational vocational levels 1 and 2 as well as the specific pedagogical needs care of pupils. We were able to define ten design parameters for this level 5 training (Dorp Van, Lem and Dehing, 2015).

- a feasible study horizon of two years, attractive for both employers and employees;
- focus on relevant pedagogical-didactical skills. Create sound pedagogical competence to serve different vocational skill levels and special needs care of pupils;
- focus on extending relevant technical and managerial skills;
- prepare practice trainers in VET for a multi-facetted professional identity, capable of training in a variety of practice situations, with varying roles, tasks and responsibilities;

- responsive to (professional) labour market requirements such as adaptability and flexibility;
- enable awareness in career planning in line with one's professional development opportunities;
- allow for interconnected pathways in the education system (from level 4 towards level 6); the training solution is an intermediate qualification (EQF level 5;
- inclusive to adults returning to the Higher Education system

Course design and implementation

The training programme for practice trainers consists of two closely connected components: (1) an on-the-job programme at the workplace (VET-school or company), and (2) an off-the-job programme at the Fontys teacher training institute. After the first year (technical training and basic training in pedagogics and didactics), the student enrols in the final stage of the associate degree for practice trainers. This year differs from the second year of the teacher training.

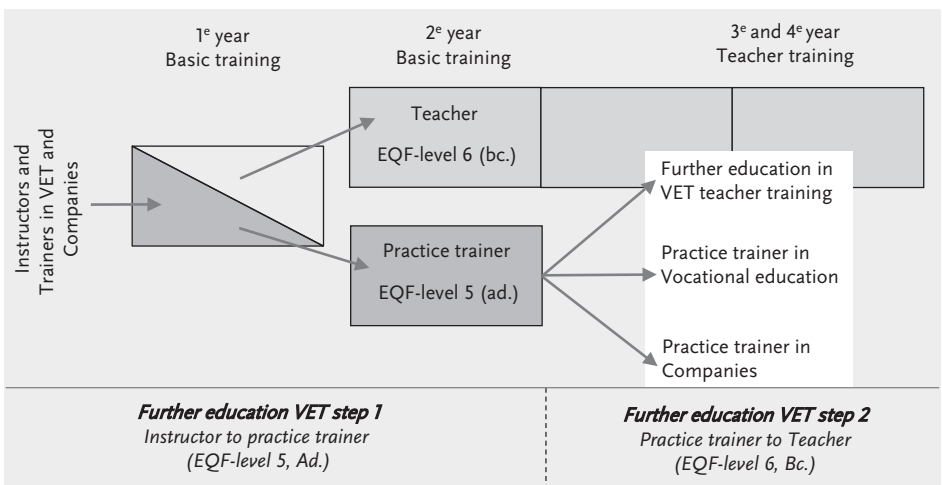

Fig. 3 Two-step Further Education for educators in VET

Although the same competences are developed, this training is much more focused on the educational setting of the practice trainer. At the end the student demonstrates by a final integrated project his competences. The project is developed, carried out and evaluated within the real educational setting of the student in vocational school or company. The project contains the development of an educational practice, for instance a 8 week new programme for welding for level 2 pupils. In the programme, the student demonstrates a variety of didactical forms and methodologies: direct instruction, demonstration, experiential learning, classroom conversation, excursion etcetera. Also the student demonstrates coaching and guidance competences, especially because practice trainers often teach in settings with special needs pupils, the pedagogical and didactical considerations

about the learning of these pupils are of great importance. Parallel to the project, the student carries out practical research. For instance, the student investigates in different schools and companies the comparable educational programmes and the way these schools deal with special needs pupils. In the end, the student has built a portfolio in which he analysis his competence development by reflecting on and referring to the project and all the different parts in the project.

During the training at the Fontys institute, the students are coached and workshops are carried out. An important element in the programme is the concept of 'the mentoring circle'. The programme considers the student as 'owner' and 'architect' of his or her own learning and development process. The students are involved in so called productive learning tasks: authentic learning projects defined by the student themselves. This basic assumption deserves, as a consequence, a trial in the 'empowering' of the mentoring and monitoring process. These student-trainers are coached by their coaches in their school or in the company and at the Fontys institute by the educator. Parallel to this formal coaching, another coaching/mentoring process is established. The mentoring process applies the social constructivist approach, with 'richness of learning environment', 'ownership of learning process', 'responsibility for results', and 'learning communities' (we learn together and we are responsible for each other). Small study groups of 4 students operate as so called 'mentoring circles', where mutual learning and mentoring is promoted. Every other week the students meet with their 'mentoring circle', taking care of each other, exchanging knowledge and ideas and sharing articles and instruments, visiting the schools of each other. They discuss the experiences in the mentoring circle. The Fontys educator supports, monitors and coaches the mentoring circles. (Lem, P., 2013).

Evaluation

The programme has been designed on the listed design requirements as on official (practice trainer) associate degree (2 year) programme. Successful conclusion of the programme leads to a level 5 qualification within the EQF. The programme is comprised of two components: an educational component and a techno-vocational component. Both are subdivided into parts that allow for the qualification objectives as prescribed by Dutch law, to be fulfilled. So as to provide for comprehensive learning, an integrated learning approach of both components is effectuated in the curriculum, including both competence and practice-based learning. The programme offers different specialisation routes: automotive, construction, metal, electro and installation, and catering and hospitality. The programme holds a particular favourable position in the Dutch education system. The programme is positioned on level 5 of the EQF and creates a bridge between EQF level 4 and EQF level 6. It provides an attractive pathway to progress up towards the Bachelor level. In European perspective, programmes at EQF level 5 are attributed much potential (CEDEFOP 2014a; CEDEFOP, 2014b).

The programme was evaluated in 2016. Some main points from the evaluation: the practice trainers underline that the study programme meets their world of

interests, skills and experiences, and, consequently the students were only very limited affected by a 'praxis-shock' in education. In this light, students also mentioned acceptance by the pupils and by staff leading to more confidence. As developers, we are glad with these remarks in the light of the importance of developing of a professional identity. Methodologically, the competence based programme was high rated. Students noticed that the programme offered all the opportunities to translate the content and competence development to their specific educational setting. For almost all students (and their family!), the 2-year duration was an extremely important aspect of the programme. The same remark came from their employers in VET-institutions and industry. One of the practice trainers mentioned another benefit for his company: *"The construction firm, where I work as an in-company trainer, uses my Associate degree for positive image and as an example of their quality insurance programme*." However, the students criticized the part of the technical subject programme. In general, they rated that part of the programme as too difficult and noticed that it was not always relevant for their job as a practice trainer. For us as developers, this is a difficult issue to tackle because the associate degree programme offers not only a readiness profile for practice trainers, but also a readiness profile for Further Education into a bachelor programme.

Conclusions and recommendations

In VET schools, the necessity of a relevant differentiation in educators has been recognized. Also it is recognized that the level-4 instructor has to be upgraded to a higher level on both the technical and pedagogical field. For Further Education of instructors in VET-schools and in companies, the (2 year) practice trainer (associate degree) programme has been designed. Participants, who successfully complete the programme, receive a formal (professional) Higher Education certificate: a (labour-market) entry qualification for practice trainer. Main objective of the Ad programme was to further professionalize VET instructors. The challenge was to provide the trainers with pedagogical competencies and technical modules to become more competent to educate level 1 and 2 vocational pupils. The participants perceived the 2 year duration of the programme and the part-time delivery mode as very appealing but, the combination study and work remained challenging. Additionally, participants were satisfied with the outline of the programme and especially with the spectrum of pedagogical competence they obtained. In contrast, participants were critical on the provided technical modules. It is assumed that this has to do with the 'struggle' to formulate and design the relevant technical knowledge base for level-5 practice trainers.

It was investigated whether the programme would effectively deal with the challenge of obtaining sufficient enrolment numbers. From the research, the authors conclude that the enrolment numbers need to improve for the programme to be really successful in face of market demand. They recommend measures to be taken within schools and industry to have the practice trainer be positioned more explicitly within the organisational function mix/map.

Authors conclude that although improvements within areas of the practice trainer programme are still needed, the programme is a necessary entry on the EQF level 5. The programme represents a formal training programme with particular strengths in terms of quality and responsiveness in view of labour (market) demand: providing a formal labour market (entrée) qualification. It holds the potential to attract (practice trainer) recruits both from vocational schools as from industry. Simultaneously, the programme caters for solutions in the short term for professionals: the perspective of managing a dual profession, working both in industry and school (part-time). Finally, new and flexible progression pathways in the Higher Education system are made possible with this new practice trainer programme: (1) by its position on EQF level 5; the programme provides (upward and downward) connectivity with both instructor and bachelor programmes, and (2) by its short cycle and part- time delivery mode; the programme allows alignment of professional career planning and manageable study horizons.

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Understanding the English subject offered in the South African Technical Vocational Education and Training Colleges and its implications for the curriculum delivery

Mary M. Madileng

Summary

Twenty one years after the South African democratic elections, vocational education which is envisaged as a critical role player in responding to the needs of industry and the labour market, is still faced with insurmountable challenges. Initiatives meant to bring about sustainable economic growth by opening ways for much wider participation in the economy, to reduce poverty and a range of related social ills and to enhance development of social mobility through vocational education, have not addressed the systemic challenges. This paper is premised on the notion that the perceived lack of quality of curriculum delivery in the vocational education sector is probably due in part to a lack of understanding of the nature of knowledge in vocational education. Furthermore, a curriculum which is looking both ways, to work and further learning; poor understanding of appropriate ways of teaching and ineffective assessment practices may also contribute to the perceived weaknesses in the vocational education sector. This article outlines the nature of knowledge and skills specified in the English subject offered in the TVET Colleges. The paper follows the English curriculum message as it starts from the production field where new ideas are created and modified, to the recontextualization field where curriculum designers produce written curriculum documents, to the reproduction field where English lecturers transform the curriculum in their classrooms. An analysis of this curriculum identifies strengths and weakness, highlights accomplishments, exposes faulty areas, and focuses on realistic policy alternatives for the TVET sector.

It helps identify gaps with regards to curriculum design, appropriate pedagogical practices and assessment practices in the TVET sector.

Keywords

Vocational Education; Outcomes-based curriculum; social mobility; social ills; National Certificate Vocational; official recontextualization field; pedagogical recontextualization field; reproduction field; pedagogic devise; pedagogical practices.

Introduction

This article examines the nature of knowledge specified in the English subject offered in the National Certificate Vocational (NCV henceforth) programmes and how lecturers of one Vocational Education and Training College interpret and understand the curriculum. Technical and Vocational Education and Training (TVET henceforth) in South Africa has its roots in the industrial and apartheid economic era from the 1920s to the 1970s. The history of vocational education in this country dates back to debates on issues of social order, educational inferiority and low intelligence (Badroodien 2004).

After the 1994 democratic elections, there was renewed enthusiasm from government, researchers and the general population for giving attention to the technical colleges. The technical colleges were transformed into Vocational Education and Training institutions. In 2007, a new curriculum called the National Certificate Vocational was introduced in TVET colleges. One of the aims of this curriculum is to serve, and enhance accessibility to, predominantly disadvantaged learners and to alleviate the shortage of skilled workers in South Africa which must be overcome if the country is to grow economically (Department of Education 2006). Furthermore, the NCV was conceptualized as an alternative route into Higher Education. The NCV curriculum aspires to address the life-long learning and developmental needs of individuals, organizations and economic sectors (Department of Education 2007). It aspires to present TVET college students with opportunities for a good general vocational education curriculum in a selected programme such as Business, Commerce and Management Studies; Manufacturing, Engineering and Technology; Physical Planning and Construction and Utility Services. TVET college students enrolled for these programmes study three compulsory subjects, also known as the 'fundamentals': English, Mathematics or Mathematical Literacy and Life Orientation. Each of these programmes also includes a minimum of four vocational subjects.

In examining the nature of knowledge specified in the subject English offered in the NCV programme, the paper utilises Bernstein's (1996) pedagogic device as a framework. The analysis follows the subject English curriculum message as it starts from the production and the recontextualization field where new ideas are created, modified and are put together to produce intended curriculum docu-

ments, to the reproduction field where English lecturers transform the curriculum into classroom teaching and learning. The study is premised on the notion that the perceived lack of quality of curriculum delivery in the Vocational Education and Training sector is due in part, to a lack of understanding of the nature of knowledge in vocational education, poor understanding of appropriate ways of teaching, and ineffective assessment practices. The next section briefly discusses how subject English is located with Bernstein's pedagogic device.

Locating English within fields of the pedagogic device

The pedagogic device is a social construct that enables understanding of how knowledge is converted into pedagogic communication. Bernstein (1996) suggests that this device constitutes the 'relay or ensemble' of rules or procedures via which knowledge is converted into pedagogic communication. According to Bernstein (2000) in order to understand how knowledge is implicated in the distribution of power and privilege within societies, analyzing how pedagogical texts are put together, the rule of their construction, how they are recontextualised and acquired would better enhance that understanding. This article used the concept of the pedagogic device to explore both the ways in which knowledge is recontextualised in the TVET college English curriculum design and how the English lecturers transform and reproduced this knowledge in their classrooms.

In allocating subject English within the fields of the pedagogic device to illustrate the nature of power relations within the educational process, I would say that in the process of designing subject English curriculum and its implementation process each sector such as language policy developers at government level and curriculum designers, researchers at universities, as well as lecturers in colleges, will exercise power of authority and forms of control within the educational process of deciding what knowledge and skills to select for inclusion in this subject, and what implementation strategies will be more appropriate and for who. The views presented in a curriculum design will be informed by the prevalent views shared by curriculum designers, specialists and practitioners in the language profession at that particular point in time. Subject English curriculum design has to be appropriate to the language curriculum, the language classroom and the learners, and to the ideologies, the purposes and the objectives of the institution and the society where it is being taught and learnt. In deciding on what knowledge to select for inclusion in subject English curriculum at different levels of learning, curriculum designers and textbook writers' selection will be done in terms of whether English is offered as a First Language, an Additional or Second Language, or a Foreign Language. Decisions will also be based on how content should be organised to ensure progression from one grade or level to the other, on allocation of appropriate teaching time for the subject per level, its sequencing and pacing and on how it should be assessed.

Literary theory debates do not explicitly locate English in the production field, recontextualization or reproduction field. This is because of the horizontal nature

of this subject and that evokes contestations about what is selected for teaching in subject English. These debates include what English is, what knowledge should be specified for English and what gets selected for the subject given the tendency of the subject to change over time. These debates brought about the contestations between a discourse of competence which is discipline specific knowledge and a discourse of social order in the subject English. I think these debates better explain why it is challenging to locate English within Bernstein's fields of the pedagogic device.

Research design and methodology

The paper examined how the intended curriculum for subject English is specified, which knowledge selections are recontextualised and how this is done. The research also examined how English lecturers at one vocational college understand the intended English curriculum. There has been minimal research done so far on curriculum and pedagogy in the South African Technical Training College sector.

Data collection

Data was collected from one South African TVET College in three campuses that have different NCV departments and programmes, Business Studies, Engineering Studies and Utility Studies. The choice of the research setting was informed by the fact that the three campuses offer different NCV fields and programmes and these differences could lead to enhanced in-depth understanding of lecturers' thinking about the intended English curriculum and why they transformed it in the ways that they do.

In analyzing the nature of English offered in the NCV programme, document analysis approach (McMillan and Schumacher 2006:448) was used as one method of collecting data. The intended English curriculum documents collected for analysis included subject guidelines for levels 2−4 prescribed to guide the lecturers in selecting content to teach in the classrooms. These are curriculum documents produced by curriculum designers and the ministry of education in the official recontextualised process. The study did not examine classroom practice, or how the lecturers implement the curriculum in the classrooms, but through semi-structured interviews, the lecturers' thinking and what guided that thinking about what the English curriculum is there for and how they transform it to benefit students in different NCV programmes was investigated.

Data analysis

The data collected in this study was analysed qualitatively (Babbie and Mouton 2001; McMillan and Schumacher 2006). Using a qualitative approach allows for an in-depth look at educational issues and also allows the researcher to gain under-

standing of the participants' relation to their contexts. In analyzing selected intended curriculum documents, focus was on content knowledge specification. Data collected from semi-structured interviews of the English lecturers was analysed in terms of the lecturers' understanding of the knowledge structure of subject English and their views about how they select, organize, treat, distribute and evaluate the acquisition of such knowledge in their classrooms with the aim of understanding what is really taught. Findings were presented in a form of responses to the two research questions:

a) *What constitutes the curriculum for English in the National Certificate Vocational curriculum?*
b) *How do lecturers interpret the subject English curriculum; what is their understanding of the curriculum?*

Summary of my findings and how they answered my research questions

What constitutes the curriculum for English in the National Certificate Vocational curriculum?

In response to the above research question, I made the following claim.

NCV EFAL curriculum is outcomes based and therefore has weak content knowledge coverage

Following the analysis of the NCV EFAL curriculum, the examination showed that it follows an outcomes-based design. An outcomes-based curriculum approach that was adopted in the design of TVET curricula was a politically driven approach which intended to meet the socio-economic, socio-historical as well as the socio-political needs of the country. Topics covered in NCV EFAL are the language skills: reading and viewing, writing and presenting, listening and speaking, and language and communication in practice. The curriculum statements under each of these topics present content knowledge in a form of a list of generic outcomes. I identified that these four linguistic processes are interrelated and that the generic outcomes that are vague and unspecified also set up artificial and blurred boundaries between these four topics in the NCV EFAL curriculum. The outcomes-based designed nature of the curriculum suggested that content knowledge of the subject English drew around the competency levels of students, and not on grounded knowledge of the subject and therefore what they should be taught. This signifies that the selection of content knowledge in the design of the curriculum does not foreground 'what is known' but 'who knows'. For Moore and Muller (1999), subjects that integrates knowledge forms such as outcomes-based curriculum design, tends to reduce knowledge to knowing and experience. This discourse of voice of the knower claims to represent the disadvantaged groups against dominant social

groups. However, according to Moore and Muller's argument, where grounded knowledge is not foregrounded, disadvantaged students are denied theoretical knowledge that is empowering.

The way in which this outcomes-based approach has been conceptualized in the NCV EFAL curriculum displayed serious omissions in terms of sequencing and progression of content. The curriculum statements tried to describe the progression process in the curriculum in terms of the contextual focus and purpose of the curriculum. However, content knowledge coverage in the curriculum does not explicitly indicate what to teach at each level and context. The progression process which is defined in outcomes-based terms does not show distinctive cognitive challenges at each level that will determine different levels of competence within and across these levels of the NCV.

The outcomes-based curriculum design therefore failed to provide guidance to the lecturers in terms of content selection to teach in the classroom, sequencing and progression of lessons. The outcomes-based curriculum design approach assumes that lecturers are experts who are able to select and teach knowledge in order to enable learners to achieve intended outcomes. Any methodology could be adopted, as long as it enabled the students to acquire the learning outcome. Vague and unspecified outcomes subjected the subject to vulnerability as what gets selected for teaching is subjected to individual lecturers' discretion.

I now turn to try and understand the lecturers' views about the curriculum they teach from. An examination of the TVET College lecturers' insights about their understanding of knowledge selected for inclusion in the intended curriculum and the examined curriculum is one of the poorly researched areas in South Africa. The lecturers' understanding of the curriculum they teach from enhances effective choice of content knowledge, resources, as well as teaching strategies. Therefore improved curriculum delivery is enhanced.

How do lecturers interpret the subject English curriculum; what is their understanding of the curriculum?

The question tried to examine how NCV lecturers interpret subject English curriculum and their perceptions about how do they recontextualise the curriculum into pedagogic practice. Transformation of the prescribed curriculum according to Bernstein's (1997) pedagogic device is the field of reproduction where teachers engage in pedagogic and assessment practice. In answering the question, how do NCV lecturers interpret subject English curriculum, I want to make the following claim to present my findings.

Lecturers had limited knowledge of the curriculum they teach from

The claim emanates from responses that explained how the English lecturers seemed to engage with the curriculum document and what they thought the cur-

riculum they taught from was all about. The lecturers felt that outcomes listed in the curriculum document were not helpful enough to guide content selection and sequencing of lessons. They instead found the textbooks more helpful to engage with rather than the curriculum statements. They seemed to follow very different criteria of sequencing, pacing and progression when selecting content to teach in lesson planning instead of following guidelines provided through the teaching plan and the progression process stipulated in the intended curriculum document.

Responses also suggested that the English lecturers were not familiar with communicative language approaches (Canale 1983, Canale and Swain 1980) that underpin the curriculum they teach from. None of the participants had an understanding of the theoretical underpinnings of the approaches. Their lack of understanding of the approaches was also evident in the ways they tried to describe theoretical underpinnings of the curriculum and the different categories that they used to explain communicative language approaches and how they thought the curriculum statements seemed to consider the students' contexts.

The findings demonstrated the short comings of an outcomes-based NCV EFAL designed curriculum and how its vagueness and lack of specificity affect the lecturers' understanding of the curriculum they teach from. The outcomes−based approach in the design of the curriculum also affected the lecturers understanding of the stipulated progression process outlined in the curriculum document. Lecturers devised other criteria for sequencing, pacing and progression in content selection and lesson planning.

Conclusions and implications

The subject English curriculum designed for the NCV programme is outcomes-based and therefore competence based. The curriculum does not explicitly outline content to be covered in the subject but presents a list of generic outcomes as content for English. Students are described as competent if they are able to apply specific knowledge, skills and attitudes in a given context rather than display any strongly defined theoretical position which might indicate rate of competence across well-grounded content knowledge.

Literature shows that outcomes-based curriculum design disadvantages the most disadvantaged communities in many countries including South Africa. Outcomes-based designed English curriculum for the NCV in particular which focuses on competence rather the mastery of grounded knowledge does not seem to benefit South African TVET college students. The curriculum does not provide a clear guidance to curriculum implementers of what knowledge to teach. I believe that South African vocational education English students would benefit from a curriculum that foregrounds the voice of grounded knowledge rather than the voice of the knower. Research findings provided evidence that English lecturers do not engage with the curriculum statements. Inability of the English lecturers to unpack curriculum statements compromises curriculum delivery in terms of content selection to teach, sequencing and progression, and assessment.

Given the above concerns, I argue that attempts to improve the quality of TVET education must include robust curriculum policy making decisions and curriculum design change which include models that are suitable for the South African context. Curriculum policy making should be informed by research that outlines educational, economical, and employment needs in South Africa instead of policy borrowing that is in most instances irrelevant and not addressing the needs of the country. Curriculum policy decisions guiding the design of the English curriculum specifically should also consider the different work-related programmes which students follow at TVET colleges and how relevant should the English subject be in that regard. Curriculum stipulations should explicitly show progression process from one level of the NCV to another in terms of cognitive difficulty of content knowledge so that the different levels of competence of students are clear enough for both vocational teachers and examiners.

Whilst my findings indicate pockets of success in the lecturers' transformation of curriculum statements, I suggest that proper vocational educator training programmes would be a better solution to the problem. Vocational education which faces both to education and work has a different purpose from that of the ordinary school education system. Vocational education educators need specific form of training to ensure that their products are competent enough and ready for work. Findings relating to Bernsteins' debates about the pedagogic device and the different fields of knowledge processing in the design of the curriculum, and the design of subject English curriculum in particular can be incorporated into the pedagogy course of the vocational educator training programmes. There should be a scope of innovation in that regard. For example, vocational educator professional development courses could be linked with research into ways to link development of teacher content knowledge to development of knowledge recontextualization and teaching strategies.

Vocational teacher education programmes should also include ESL development theories and theories that underpin the curriculum they teach from. In developing students' language skills such as reading, writing, listening and speaking, vocational teachers need to understand theoretical debates of ESL acquisition as well as what is involved in these skills and how they could be acquired. Pedagogical development courses should include ways of unpacking curriculum statements, select appropriate text and resources and decide upon appropriate teaching strategies when teaching selected topics. This way they would develop both the target teaching skills and the content knowledge about the selected topics. Vocational educators need to develop competence in context-related pedagogies and situational teaching approaches in ensuring effective utilization of communicative language teaching approaches. Such an understanding can enhance an overall understanding of the production, recontextualization and the reproduction process of knowledge in the design of subject English curriculum.

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A Review on TVET Programmes in Ethiopia: An Experience in Biomedical Technician Education

Esayas Alemayehu

Summary

Various policy documents emphasize the need for expanding both formal and non-formal technical Vocational Education and Training (TVET) programmes so that Ethiopia could emerge as one of the countries where its people enjoy economic prosperity and improve their life conditions. Among different programmes demanded at the TVET level, biomedical technician programme is number one since the type and complexity of the biomedical equipment available in Ethiopian healthcare facilities is expanding. However, this is confronted with a number of challenges that seek solution. This desk study is attempted to cover the art of review of the status of Technical and Vocational Education and Training in biomedical technician disciples in Ethiopia. The focus is to review strengths, weaknesses, opportunities and threats (SWOT) as well as lessons learned and options for supports for the sectors. Reviewing the available documents on TVET was one of the measures taken in generating data for this study. Furthermore, lessons learned through partnership activities.

The availability of clear policy direction is a good opportunity for extending both formal and non-formal TVET programmes for all those who would like to run the business. Measures taken by the government indicate that there is willingness to meet all policy gaps. Trainers available at TVET centers are lacking practical competency. Alleviating the situation requires serious practical training for existing trainers. Care has also to be taken in the recruitment and deployment of trainers. Well-developed training manuals are also lacking in biomedical technicians center as well as other TVET centers. This is due to trainers' inability to prepare their own training materials. Trainers need training and coaching in the development of training materials. In this regard the Ministry of Education (MoE) and TVET Agency should take the leading role. Linking TVET provision to local and international stakeholders could also solve the problems of seed money, revolving fund, coaching, etc. as proved through the Partnership. The plan for attaching the biomedical

technicians programme to hospitals and other health related institutions has not fully materialized. The cause problem is mainly lack of cooperation of the employers as they were not consulted during the planning process. Solving this problem requires further advocacy work. Facilitating and equipping the biomedical technician institute with up to date training gadgets is also essential. These are areas in which stakeholders could give support. As conclusion, studies made on TVET programme are insignificant. Documentation, research and evaluation outputs appear to be neglected. This needs to be the concern of all governmental and non-governmental stakeholders.

Introduction

Background

The Ethiopian government has recognized the importance and the need for establishing a large number of technical vocational educations and training (TVET) institutions in the effort to promote economic and technological development in the country. The vision of TVET as stated in the national Technical and Vocational Education and Training document (MoE, 2008a): *TVET in Ethiopia seeks to create competent and self-reliant citizens to contribute to the economic and social development of the country, thus improving the livelihoods of all Ethiopians and sustainably reducing poverty.* It is with this vision as well as to provide options for the increasing number of school leavers, the Government embarked upon a massive expansion of TVET since 1993. Within a short period it has managed to increase the number of TVET centers from 15 in 1994 to 388 in 2007 (MoE, 2008b). Among different centers demanded at the TVET level, biomedical technician center is number one since the type and complexity of the biomedical equipment available in Ethiopia healthcare facilities is expanding.

However, the growth in capability to manage or maintain medical equipment lagging far behind the rate of deployment of equipment and the situation risks running out of control. Capital investment is being wasted while quality of care suffers. To be part of the long term solution to these problems, Tegbare-id Polytechnic College (TiPC) took the initiative to launch the first TVET biomedical technician programme in Ethiopia. The programme was launched with the main objectives of alleviating the challenge of biomedical equipment management, and thereby improving the quality of health care in the country. The programme is aimed at alleviating the challenge of biomedical equipment maintenance and thereby improving quality of health care in the country. In order to strengthen the teaching learning activities at the department, the American International Health Alliance (AIHA) Twinning Center has launched Biomedical Technician Training Capacity Building Partnership (BTCBP) with two Ethiopian institutions: TiPC and Jimma University, Jimma institute of Technology (JiT), and two US based institutions Rice University and Texas Children's Hospital in Huston, Texas (Alemayehu, 2013). Through this partnership, the department equipped with latest biomedical

equipment which really enhanced the practical knowledge and skill of the students.

In the past, there have been attempts to investigate the status of TVET provisions in Ethiopia by different groups and individuals (Dibaba, et al., 1992; MoE, 2005; CINOP report, 2008). It has been more than a decade since these insight full findings were reported. Recently another study was made on TVET mapping in Ethiopia (EF, 2009) whose findings have been incorporated in this study. In such case, this study is another attempt to cover the art of review of the status of formal and non-formal TVET in the country with special focus on biomedical technician training. Thus, the overall objective of this study is to investigate strengths, weaknesses, opportunities and threats (SWOT) of TVET in Ethiopia as well as lessons learned through BTCBP and options for supports for the biomedical technician programme. Reviewing the available documents on TVET was one of the measures taken in generating data for this study.

Research Design and Methodology

Design: A cross-sectional research design was employed to investigate the strengths, weaknesses, opportunities and threats (SWOT) of TVET in Ethiopia.

Sources of Data and Sampling: In order to investigate the SWOT of TVET in Ethiopia, data were collected from both primary and secondary sources. Policies, strategies, curricula, reports, and previous researches were the secondary sources of data, whereas the TVET – biomedical equipment maintenance documents obtained from the Tegbare-id Polytechnic College (TiPC) and BTCBP were used as primary sources of data. A total of 12 documents were reviewed. In addition, the Head of biomedical technician, Coordinator of the biomedical partnership, Knowledge Resources Center (KRC) coordinator, and five TiPC graduates were purposively selected for interview.

Method of data collection and analysis: Data were collected using two methods namely document analysis and interview. Document analysis was used as a main method of data collection. A checklist consisting of closed ended questions was used to extract data from the documents. The interview was used to augment data collected through document analysis. The major components of the interview were mechanisms in place in the TiPC to evaluate the status of biomedical technician training programme in the newly established partnership. Hence, the data obtained through the checklist was described using frequency and percentage.

Findings

TVET in Ethiopia: Facts and figures

After the introduction of the Education and Training policy in 1994, the number of formal and non-formal TVET provision centers has mushroomed (Table 1). Of these, over 30 % were trained in non-government TVET institutions. Around 60 %

of formal TVET is provided in the form of regular programmes and 40 % in evening classes. Table 1 shows the growth of enrollment in formal TVET institutions as reported by Ministry of Education (MoE), Annual Statistical Abstract (MoE, 2008b).

Tab. 1 Students enrollment in formal TVET centers*

Year	Number of students (Male; % of females)	Average annual growth rate
2002/03	72,162 (M = 37,377; %F = 48.2)	–
2003/04	87,158 (M = 45,798; %F = 47.5)	30.2
2004/05	106,336 (M = 51,940; %F = 51.2)	24.6
2005/06	123,557 (M = 61,415; %F = 50.3)	27.6
2006/07	191,151 (M = 107,327; %F = 43.9)	30.0

* The actual enrollment data could be higher than that shown in the table above since data from four regions (Afar, Somali, Gambela and Harari) was not included.

The table shows that there has been steady increase in the number of students enrolled in formal TVET training institutions. Despite the enormous expansion of formal TVET programme, it only caters for less than 3 % of the relevant age group (EF, 2009). Furthermore, the study made by Edukans Foundation (2009) came up with more detailed 2006/07 enrollment data in TVET centers by region (Table 2).

Tab. 2 Distribution of TVET 2006/07 enrollment by region

Region	Number of TVET centers	Total Enrollment	Number of Teachers	Teachers–Students ratio
ADDIS ABABA	98	45,195	1,742	1:26
AMHARA	61	29,830	1,238	1:24
BENSHANGUL GUMUZ	14	3,707	188	1:20
DIRE DAWA	9	4,208	130	1:32
OROMIA	103	52,596	1,768	1:30
SNNP	63	36,198	1,155	1:31
TIGRAY	40	19,420	862	1:23
Total	388	191,151	7,083	1:27

The number of TVET institutions owned by the government and private sectors was also reported to be more or less equal.

The Non-formal TVET provisions in Ethiopia

By definition, non-formal TVET (NF-TVET) means training based on well-defined curricula, either within or without an institution, with or without guidance from teacher or trainer (MoE, 1998). According to the previous studies (Dibaba, *et al.*, 1992; MoE, 1998; EF, 2009) reports, NF-TVET differs from formal TVET in the following respects:

- The educational background of the target group is different and very diverse;
- Teachers/trainers/instructors are so far usually not certified or examined;

- There are no standardized curricula to be used in NF-TVET provision;
- The duration of training is usually shorter and varies widely;
- NF-TVET is more cost effective than formal TVET.

In Ethiopia, some of the known trades given in NF-TVET centers included woodwork, metalwork, tailoring, embroidery, weaving, typing, computer training, driving, etc. These trades have been given in institutions like community skill training centers (CSTC), prisons and other government institutions. However experiences vary across regions in the country and in other countries regarding the types of trainings given and the modality under which it is given.

The recent NF-TVET mapping survey report showed that NF-TVET is provided in over 400 government, private, community and non-governmental organizations (EF, 2009). The number is expected to be much more than this. However, the NF-TVET system has not been able to fully meet the training needs of the increasing number of youths and adults, Primary and Secondary school leavers, drop outs illiterate adults. This is further threatened by the deep rooted traditional attitudinal outlook towards crafts and craftsmanship. The latter is known as the main cause's underutilization of NF-TVET in particular CSTCs. Resources shortage is also reported (Dibaba, et al., 1992; EF, 2009) as a critical issue in the centers run by the government. Lack of adequate place of work and running costs are also the major challenges. It is also affecting the quality of training provided. In addition to government and NGOs support, training centers themselves have to generate their own fund.

SWOT analysis of TVET provisions in Ethiopia

The major SWOT facing the formal TVET programmes have been well studied by Edukans Foundation (2009). With some little modifications, the core ones are elaborated in sub-sections 2.3.1, 2.3.2, and 2.3.3.

SWOT analysis of TVET Policy

A number of policy documents related to TVET training are available. Some of these are the Plan for Accelerated and Sustained Development to end Poverty (PASDEP) (TVETS, 2006), and the TVET strategy and the Education and Training Policy (TGE, 1994a). The SWOT facing TVET Policy is summarized in table 3. It implies that the government has issued useful policy documents necessary for development and implementation of both formal and non-formal TVET programmes. This leadership role has to continue in consultation with stakeholders.

Tab. 3 SWOT: TVET Policy

Issue	Policy
Strength	Available
Weakness	–
Opportunities	Government commitment
Threats	Lack of conducive environment
Proposed intervention	Conducting studies on policy implementation

SWOT analysis of TVET Curriculum

More than twenty broad vocational areas have been identified for the TVET programme by the MoE. Over 163 trades were also intended under the twenty vocations (MoE, 1998; MoE, 2008a). The number of trades is not yet exhausted, more could be identified. Occupational standards were developed for all the trades being provided in formal TVET institutions with the involvement of stakeholders.

In the reformed Ethiopian TVET-System (TVETS, 2006), Curricula and Curriculum development play an important role with regard to quality driven TVET-Delivery. Curricula help to facilitate the learning process in a way, that learners acquire the set of occupational competencies (skills, knowledge and attitude) required at the working place and defined in the Ethiopian Occupational Standards (EOS). Although there have not been documented evaluative studies ever since the new occupational standards have been implemented, the SWOT facing TVET Curriculum is briefly summarized by Edukans Foundation (EF, 2009) in table 4.

Tab. 4 SWOT: TVET Curriculum

Issue	Curriculum
Strength	Availability of occupational standards
Weakness	Lack of competency for preparing training materials at the grassroots level
Opportunities	Readiness to improve the occupational standards with the involvement of stakeholders
Threats	Lack of skill in developing training materials
Proposed intervention	Providing training to trainers on training materials development

The major problem observed in curriculum development was also indicated by Edukans Foundation (2009) i.e. 'the continuous change made in it. At the beginning, all training materials prepared centrally and used by all institutions with similar inputs and processes. That was changed shortly by occupational standards which were prepared for 10 + 1, 10 + 2 and 10 + 3 programme. Lately, the development of the occupational standards has been re-categorized into five levels i.e. Level 1, Level 2, Level 3, Level 4 and Level 5 packages. This has created a feeling of discomfort on both developers and implementers, and is seen as wastage of time and other resources.

Lessons learned from biomedical technician curriculum development

Presently MoE-TVET Reform came up with the guide to curriculum development in the area of Advanced Biomedical Equipment Servicing Management

(TVETCDM, 2011). The programme is designed to develop the necessary knowledge, skills and attitude of the learners to the standard required by the EOS. The expected outputs of this programme are the learners' acquisition and implementation of **Competence** in Advanced Biomedical Equipment Servicing Management (ABESM). Each unit of Competence has its own specific **Learning Outcomes** with defined duration. Table 5 shows an example:

Tab. 5 ABESM Unit of Competence with the Learning Outcomes and specific duration

Unit of Competence: Module code & Title	Learning Outcomes	Duration
Manage Biomedical Equipment: EEL BES4 M05 Managing Biomedical Equipment	• Plan and prepare management of servicing operations • Keep inventory of biomedical equipment • Manage and monitor servicing operation • Evaluate and document servicing system • Improve work process and staff	50 hrs

Based on the descriptors elaborated on the Ethiopian TVET Qualification Framework (NTQF), the qualification of this specific Programme is "**Level IV**". The learner can exit after successfully completing the modules in one level and will be awarded the equivalent institutional certificate on the level completed. The learner can also exit after completing any one learning module. However, only a certificate of attainment or attendance (this is institutional discretion) will be awarded.

The programme will have a duration of 500 hrs including on the job practice or cooperative training time and civic education. The teachers conducting this particular TVET Programme are **B Level** and have satisfactory practical experiences or equivalent qualifications on biomedical equipment.

The mode of delivery is **co-operative training**. The TVET-institution and identified companies/Hospitals have forged an agreement to co-operate with regard to implementation of this programme.

- The proportion of time spent for theory and practice (30:70) seems sounding. However, one doubts its practicality since most of the trainers tend to make the training more theoretical since they lack practical skills. This could be amended by the apprenticeship programme provided it is coordinated and made effective.
- The other challenge with regard to TVET training is the lack of opportunity for Practicum. There are no adequate number of institutions, factories, production units and other opportunities for attachment. The few that are available are not willing to provide attachment opportunities.

It is said that many of the government TVET training institutions are well equipped and furnished. Facilitating and equipping the institutions with up to date training gadgets is essential. This is an area in which stakeholders could give support. It has been reported that the partnership supports has made the TiPC biomedical technician department in good condition (Alemayehu, 2013).

Moreover, trainers available at both formal and non-formal TVET centers are lacking practical competency. Alleviating the situation requires serious practical train-

ing for existing trainers. Care has also to be taken in the recruitment and deployment of trainers.

In practice, a number of short term training has been organized through the partnership to capacitate trainers. The government has also made efforts to bring expatriate trainers who could bridge the gap. Yet many feel that care be taken in the selection and deployment of expatriates and more efforts be done to continually upgrade the capacity of local trainers.

Furthermore, developing training materials has become a challenge for all TVET institutions. This is due to trainers' inability to prepare their own training materials. To curve the problem, model training materials have been developed and disseminated. However, training institutions are seen using old materials and the model materials without much change (EF, 2009). In this regard the MoE should take the leading role and other stakeholders should provide supporting in the form finance, availing trainers, etc.

Summary

Based on the present study, the following conclusions were drawn:

- The government has issued useful policy documents necessary for development and implementation of both formal and non-formal TVET programmes. This leadership role has to continue in consultation with stakeholders.
- The non-government organizations, bilateral and multilateral organizations supporting the TVET programmes are few in number. In this regard, the MoE needs to carry out intensive advocacy work and win their support.
- Hospitals, industries, production units and other health institutions are not committed in providing apprentice services to trainees. This may require introducing incentive mechanisms to apprenticeship providers and employers. Financial and other ways of providing incentives based on the experiences of other countries need to be introduced.
- The TiPC TVET center has not been able to fully meet the biomedical technicians' needs of the increasing number of hospitals and other health related institutions in the country. This makes it necessary to establish, facilitate and equip more and more TVET centers. In this regard, NGOs and the private sector need to play more role as the government has budget limitations.
- Most curricula used in formal TVET were not developed based on occupational standards. There have not been documented evaluative studies ever since the new occupational standards have been implemented. The lack of adequate and appropriate quantitative and qualitative information on biomedical technicians labour market needs has created a gap in the generation of information that could have been used for improving practice and policy.

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From "the Chicken or the Egg" Technical-Vocational and Informal Training Story to Industry's Manpower, What Comes first? A Philosophical Study

Daniel Dinis da Costa

Abstract

This study reports on an investigation of Technical Vocational Education Training (TVET) graduates on 'on-job' and 'self' trained employability in Mozambique. From these two perspectives, so a chicken-or-egg situation, the research seeks to understand how youth enter or stay aloof in the world of working as it increasingly lacks of qualified manpower. TVET is thought of as a kind of instruction that is designed to empower individuals with professional skills and critical knowledge which the industry needs for production. However, there is a technical-and-vocational education that can be obtained out-of-college; hence in an informal setting which counts, so to speak of, as an invaluable 'asset' for the industry's manpower. As an ongoing research study, 33 participants are part of the inquiry of which eight Mozambique Aluminum (MOZAL) self-instructed workers were selected for a semi-structured interview for data collection. The results seemed to indicate that respondents' perceptions towards TVET graduates' employability and entrepreneurships are fivefold: (i) Policy making decisions; (ii) Resources; (iii) Curricula; (iv) Research; and (v) Industry. As this study has aimed to investigate the underpinning factors for working in industry and self-employment, it has strived to understand what makes employers to consider 'on job' and the self-learning as 'good prospect' for their industry with hope that it could use it to find out whether or not these two types of training adequately prepare young people for a whole range of company's challenges. The study provided a synopsis of possible factors and hindrances which might inform and influence employability and/or entrepreneurship.

Keywords

TVET graduates, On-job training, Residential/self-instruction, employability, entrepreneurship

Background to the study

This study reports on an investigation of Technical Vocational Education Training (TVET) graduates on 'on-job' and 'self' trained employability. Historically, TVET in Mozambique falls under two separate state portfolios: the first one was/is overseen by the Department of (Higher) Education and the second one that is run by the Department of Employment, Labour and Social Welfare. The research analyses the latter as it seeks to grasp the (real) picture of how youth enter or stay aloof in the world of working as well as job market lack of qualified manpower needed for the country's economic sustainable growth and long-term development. It is known that the labour sector struggles to attract local young professionals because either there is a shortage of TVET institutions' leavers to fill available job positions at job markets, or companies tend to recruit expatriates who are more qualified and handsomely paid than the local ones. World-class, capital-intensive, internationally business-bound companies in Mozambique's provinces of Cape Delgado (Anadarko, ENI and ENH on gas exploration), Nampula (Northern railway corridor and Nacala Port serving landlocked Southern African nations such as Malawi, Zambia and Zimbabwe), Inhambane (Sasol gas pipeline Mozambique-South Africa), Tete (Hydro-Electric power dam to South Africa, Zimbabwe and Malawi) and Maputo (Mozambique Aluminium/MOZAL) rely on the latter. If locals are employed, then they are supposed to undergo 'in-plant', 'on-job' or 'offshore' training which is mostly in-country certified by the Instituto Nacional de Emprego e Formação Profissional (INEFP) for professional/vocation and labour studies (INEFP, 2016). The professional institutes and colleges under INEFP act 'now' as 'player'/provider' and 'referee' and INEFP has sought to adopt international certification by a London-based certification company for 9000 ISO. The launch of a new National Authority for Professional Education (ANEP) aims to be a regulator to tackle prevailing issues such as 'the competence based training' debate, training of instructors, levels and acquired competences, confusion in not/forming separate qualifications to TVET and Universities and the role of Polytechnics. This regulatory body should ensure that these capital-intensive industries are assured of proper training standards, geared to technological advancement and producing well-qualified professionals.

Aim of the study

As this study aimed to investigate the underpinning factors for TVET system in Mozambique, this paper strived to understand what makes employers consider 'on job' and 'self' trained ones as 'good prospect' for their companies with hope

that these companies could use to find out whether or not these two kinds of training prepare adequately young people for the whole range of companies internship/leadership programmes. This brings us to the question: *How is the TVET system in Mozambique organized to respond to the world of work?*

Research questions

The study research questions that were proposed are as follows:

- To what extent do policy making decisions inform and influence technical and vocational education at college, 'on job' and 'self' training routes?
- In which way the college, 'on job' and 'self' training routes programmes 'de facto' curriculum/Pedagogy of TVET lead to high standard training?
- How resourceful are college, 'on job' and 'self' training routes, in order to meet the required training standards set by regulatory agencies, companies and professional associations?
- Is there a possible comparability measure between college leavers, 'on job' and 'self' trained in terms of their employability?

Conceptual Framework/Theoretical assumptions

Ontologically speaking, technical Vocational Education and Training is thought of as a kind of instruction that is designed to empower individuals with professional skills and core and critical knowledge which the industry needs to develop intended technologies, derive new work processes and bring about production through product development as well the well-being by reducing poverty. TVET stands for shared vision and complexities. Lester Smith (1970) sees vocational education as bound to industry development. This definition drives the Mozambique Employment, Labour and Social Welfare Ministry's new policy scheme that abides both TVET institutions and the industries. Historically, the TVET institution still viewed in this millennium differently and treated mostly as separate 'rather dodgy' route to excel in life as opposed to secondary schooling. As a result of this underestimation, technical education in Mozambique lacks behind and is seen as second-rate education for young underprivileged, impoverished, from poor parenting/parenthood and from minorities' and also from suburban and peripheral settings, side-lined and hence those deprived from state or private educational resources. There is also another 'chicken and an egg" story concerning what subsystem actually does well in providing manpower between technical schools/colleges (seemly scholastic) and vocational/professional training (practice-oriented). What distinguishes these two subsystems seems to lie at the perceptions' level rather than the quality of training, learning outcomes or skills developed. The industry is keen to recruit who it feels is the best 'value for money' and happened to be the latter case. Thanks to recent legislation that regulates apprenticeships and learnerships programmes approved by the Mozambican Parliament, it is possible now that the Government eases up revenues and levees for those companies that

allow 'in-plant', 'on-job' and collaborative training so that apprentices and learners are updated in new technological advances and be fit for works and jobs to come within industry. However, the establishment of technical schools and institutes of technologies within the higher education brings about a new realm in the Vocational Education and Training as the Government of Mozambique (tries to) use(s) these to curtail strongly-held beliefs that technical and vocational education is tawdry as it is regarded as 'second choice' and 'last resort' when it comes to choose the 'right [path for] education'. This leads us to theoretically assume that for those who do not choose to [go for] neither secondary education nor for technical and vocational education, their choice may likely be vocational training as well as at work place. Work-place vocational training is so to speak of a kind of training undergone whilst the trainee works. Depending on the kind of contractual ties there may be or not remuneration. Besides, there are employers who on understanding of trainee social situation, they may offer as they work or at end a small or handsome grant. The multimillion dollar companies MOZAL and Anadarko/ENI may have chosen to conduct different work-place vocational training approaches due to their core business: Gas and petroleum. MOZAL conducts in-plant training and in partnership with INEFP (Da Costa, 2013) and the latter after admissions seeks to grant scholarships for appropriate professional training offshore. This will lead us also to a belief that there may be many out there in entrepreneurship activities. As entrepreneurs, the youth engage in a 'self-learning', 'self-empowering' and 'professional-oriented' instructive mechanism that can therefore be 'any given time' and 'anywhere'.

Research approach/Materials and methods

To carry out this research, the study subjects were college leavers from Instituto Industrial de Maputo (IIM) who completed their third year in civil engineering, mechanics and industrial chemistry. 'On job' trained subjects were the newly employed and experienced workers from Mozambique Aluminum (MOZAL) who have undergone in-plant training programmes. The 'self'-training subject are taken as entrepreneurs who may choose to get their training whilst at work or attend forms of residential face-to-face tuitions. As an ongoing research study, 33 participants are part of the inquiry of which eight Mozambique Aluminum (MOZAL) self-instructed workers (INEFP graduates) were selected for a semi-structured interview for data collection.

The findings and discussion

The results seemed to show that the influences on TVET system and provision of TVET education are fivefold: (i) Policy making decisions; (ii) Resources; (iii) Curricula; (iv) Research; and (v) The Industry.

Policy making decisions

From the emergent data, the respondents' views on policy making decision show that:

> [...] Technical-Vocational Education and Training **(TVET) is not the authorities' priority** (R6). "It **doesn't see it; doesn't recognize [its] importance**...(R1). Furthermore "...there is lack of commitment [...] but (...) **the country's development is TVET-based** (R7). Notwithstanding these, "there has been an attempt to equate TVET to general education. However, **TVET needs a large capital investment**. (R3). The **Integrated Programme to Professional Education Reform** (PIREP) has brought about new realm of a **competence-based training**. Many see it as advocating TVET provision without academic qualifications (R5). In 80s, the State Secretariat for Professional Education (SETEP) and Ministry of Labour pursed the policy use to demand that TVET be exclusively of **practice-orientated** only. This has led many to shy away from the TVET subsystem to general education (R8). It was also suggested that "the policy for TVET can be implemented under the following *sine-quanon* conditions: (1) A **good and sound training model** of TVET; (2) Good **investment policies** to allow equipping the training institutions with 'state-of-art' **infrastructure and lab facilities**. Under the current TVET reforms **continuous in-service training of instructors** is envisaged (R4). There is [then] a need for a policy that institutes that the curriculum should comprise two fundamental parts: (i) The **knowing** [philosophical and/or theoretical aspect of training]; (ii) the **knowing-know** [competency-based training taught through Standard Units of competencies] to be able to do professionally an activity (R7). [It is practicable] to allow all interested **stakeholders to have a say and play a role in the policy making decisions** so that in the implementation phase it be easier to adopt needed changes (R2).

Under a memorandum of understanding between the Universidade Pedagógica and the University of Magdeburg, the Prof. Jianeven (2013) proposed that "there is a need of establishing a forum in which the Industry, the University and colleges, as well as employers come together to discuss matters that are relevant to TVET" in order to eventually come up with a joint training agenda and policies that can inform what type of training should take shape within the training institutions so that the world of work gets graduates who are trained within the agreed scope.

Resources

The data show that as well as financial, the material resources are the most important undertake for a sound TVET provision:

> The PIREP's reform was chief to provide the necessary **infrastructure, equipment and labs facilities** were deployed for both public technical and vocational education institutions (R3). [Indeed] equipment, infrastructure, labs and **workshops** are part of reform implements (R6).

Most respondents have indicated that 'laboratories' and 'training facilities' make up an important 'asset' for a functioning TVET institution. The findings corrobor-

ate with UNEVOC standing that are supportive of the vision that a shared use of training institutions' resources such as labs, lecturers and students mobility and partnering in doing research activity and community interventions.

Curricula

The evidence arising out from data shows the TVET curricula as portraying the following:

> As it can be seen, the **curriculum is neither good nor bad**. Because it lacks its philosophical [knowledge] part (R2). The **curriculum doesn't give the same qualifications as those of 12th grade leavers** (R1). TVET leavers do not prescribe the requirements to enter the university studies, but **good for the world of the work demands** (R8). The **curriculum does not teach the theories**. The trainee does not know how, what and for what [insights] on competence-based training (R3). Knowing-how doesn't make it necessarily adequate for what is needed to do, so one in some degree **needs a theoretical approach** [knowledge] (R4; R2). The curriculum places more emphasis on **execution** (competence-based) that are needed in big companies. It is actually for **occupational work than professional one** (R5). Just to realize how far we went with these two TVET courses: **Industrial Mechanics** and **industrial electricity (**R1). To be able to manage this curriculum, you need **qualified trainers** for a **sound TVET programme** (R1; R6).The graduate will not get **professional autonomy** (R7). [Nor she/he will excel in the] **entrepreneurship** [world] fully with this curriculum (R1). (...) To who PIREP went to get an advice on the current curriculum? Obviously the **big companies** are the ones who benefited most from the PIREP consultation; 'forgetting' the **small businesses** (R2).

The results show that the curriculum and curriculum development 'see' instructors' training as significant element/step towards any successful 'management of TVET institutions'. Most interviewed stressed that there should be curriculum 'strands' that are 'strongly enough to buy in' by the industry. The industry 'knows' what 'quality' of 'instructors', 'curriculum content' and 'trainees profile' it wants to attain results which cater for its needs and demands. The Government new rules and incentives (GoM, 2015) ease up doors for more participation and partnership in constituting what should be laid down rather than a simple prescription of the curriculum content, the actual 'subject matters' and the competence-based skills as well as the continuous training of instructors.

Research

Looking at the emerging data, TVET research results are as follows:

> The system of TVET in Mozambique relies on **inventors and innovators**. The colleges and institution of professional training also organize **exhibitions (displays)** (R1). There is also a scarcity of **research activities** (R3) (...) need for the **research training** (R7) (...) therefore, if there is **no investment, no research** (R1). [One prevailing situation is that] there is a **lack of motivation** among trainers and other players to do research in the system (R6). **Resistance to change and apathy** go hand-in-

hand in the process of implementing the new curriculum (R1; R8; R4). [It seems that] **applied research** is the way forward. Most research conducted in the TVET field is commissioned rather than being part of the process of training and learning (R4, R5). There is therefore the need for **maximizing time for labs work; experiments**, **joint applied research,** etc. (R1).

The evidence indicates the 'scarcity' of that research activity and publishing at higher education sector and TVET institutions. These has led to GoM's (ibid.) legislative scheme in 'funding of higher education' policy and fiscal incentives, and also looks at where to allocate financial resources: The number of students to be enrolled, the graduation rates and type and number of scientific articles produced. The implementation of these measures poses a serious challenge to TVET institutions because its 'academic' staff lack of training in managing research.

The Industry

The industry system and in its relation with TVET institutions to optimize synergies for the workers profile it needs is screened through the following data:

> The industry has **rigorous criteria**. The **graduates under PIREP reform meet industry's criteria** (R6). Workers on the early stage of their careers are subject to **on-job training**. TVET institutions provide tools only to them. The reform stresses on-job training to meet the industry rigorous demands (R3; R2). In addition, the **curriculum** *per se* is developed with **industry participation** (R6). DINET (The Nation Directorate for Technical Education) and the industry agreed that professional training should entail: **40 % theory and 60 % practice** (R4). [Studies on TVET graduates'] **employability** need to be conducted (R1; R8). Large industrial employers demand area **experts/specialists and new technologies** (R1; R5). However, the way training is undertaken; specialist-based, makes the industry's work expensive and the **small businesses struggle to catch up** (R7, R5, R2).

Generally it was found that there is a 'missing' link between the industry' demands and needs of the 'management at school level', as the colleges and industry fail to recognize and build a common vision and ground for the trainees' profile to be designed together, for mentors from industry to intervene in the TVET institutions, lecturer to get acquainted with the industry developments, and the industry itself arrange for apprenticeship and leadership programmes. The way forward is, so to speak of, for setting and forging a 'new contract' of possibilities under a win-win smart partnership to pursue and tackle ways for technological advances together as both excel in it.

Concluding remarks/Conclusions

The study provided a synopsis of some possible TVET factors and hindrances which inform and influence employability and entrepreneurship in Mozambique. As it has been realized the TVET system is twofold: one technical education (with sound theoretical approaches), another vocational which is practice-oriented type

of training. However, the whole system is held responsible for producing a 'good employees' and a "bad entrepreneurs" (Barca, 2015). The results seem to point to future studies on TVET laws, regulation and rules; the strengthening of the ANEP role and resources-sharing particularly those making practical/professional training meaningful and relevant to the world of work as well as demands of the industry. Although these results capture only the perceptions respondents hold over the TVET system and in-service training, quantitative data need to be collected to measure the strength and pitfalls of the work-force and their contributions to the world of work.

Acknowledgements

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The Concept of Competence Based Assessment in Vocational Education and Training

Ethel Kyobe

Globally, Vocational Education and Training (VET) has been addressed differently with three (3) distinct models around the world. The developed countries have been able to customize the Vocational Education and Training curriculum to specifically address the demands and requirements of their own environment.

There are three (3) distinct models worldwide;

- The liberal market economy model, its supply reflect the demands of the private market *(Great Britain and Australia)*
- The state regulated bureaucratic model where National education systems define, provide and finance Vocational Education and Training *(France, Italy, Sweden and Finland)*
- The dual system model strong public-private collaboration, enterprises finance apprenticeship training and state agencies finance the TVET schools *(Germany, Austria, Switzerland, Denmark and Norway)*

However, developing countries are struggling to adapt Competence Based Education and Training (CBET) in order to reform their education and training systems to include and introduce skills training. There is an effort to establish a Technical Vocational Education and Training (TVET) system to balance academic grades and skills in Competence Based Education and Training. The provision of TVET is viewed as a necessary intervention that attempts to empower people, reduce poverty and realize the Millennium Development Goals. It is argued that, if people, especially the youth, are equipped with employable skills with which they can access labour markets, then the incidence of unemployment, poverty and other undesirable consequences of social-economic exclusion would be reduced. The International Labour Organization congress held in Geneva 2012 resolved that TVET has emerged as an important conduct for confronting and resolving the global "youth employment crisis".

TVET is a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and

related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupants in various sectors of economic and social life. Its framework includes Governance, Industry engagement, Competency Based Standards, Qualifications Framework, Quality Standards for providers, Delivery and Assessment.

The African Union (AU) recommends a TVET system that is based on a solid foundation of a social general education with a possibility for specialized technical and credit transfer to Further Education training.

TVET contains 3 main organization components;

- General education – considered as the foundation for Technical Vocational Education and Training
- Initial Training Systems is often referred to as "Vocational Education"
- Continuing Training System concerns life-long vocational training – new direction of TVET globally

Vocational Education and Training is quite rooted in general education and little attention is given to research. Understanding the complex interplay between learning at work and learning at school is then urgent. Action research is one tool which analyses the interplay and can easily evolve into real production. This gives the new direction of TVET globally, which includes Life-Long Learning.

The continuing training system concerns life-long vocational training. Research has shown that true work ethics and authentic labour market competences for economic development can only be attained through learning by doing at the workplace. Competence is the ability to demonstrate a set of skills, knowledge/understanding and attitudes required to do a job or to perform tasks and duties successfully. Competences can be measured against well-accepted standards and assessed against provided evidences at work location. "Human competency is the ability to perform, knowledge alone is of little value" said William Blank.

Concept of CBET is based on several principles which include flexible training or training/learning modules, assessment and certification, recognition of prior learning, work place learning and self-paced learning.

The prescription for CBET has the following parameters;

- It is industrial led and demand driven.
- It focuses on competence based outcomes with transparent assessment system which has positive certification.
- It encourages life-long learning with recognition of prior learning and a credit transfer system.

Competency Based Assessment (CBA) is emphasized in occupational assessment as a measure of occupational competence of individuals to support occupational learning. The assessment types include norm referenced and criterion referenced. In CBET system, criterion assessments are used. It is prudent to observe the features of a good assessment – validity, reliability, objectivity, efficiency, transparency, effectiveness and differentiation. The learning domains cognitive and psy-

chomotor domain allows us to differentiate the levels of complexity in terms of competence. Blooms Taxonomy of cognitive domain demystifies the skills at different levels. Competence Based Assessment calls for a comprehensive assessment system including theory, practical and oral items.

In order for a worker/trainer to carry out a standardized labour activity, he must be formally assessed and verified to prove that he is competent.

The certification of competencies refers to the formal recognition of the proved competency (thus, assessed and verified) of an individual in order for him to carry out a standardized labour activity.

The issue of a certificate implies that there has been a prior process of competency assessment. In a standardized system, the certificate is not a diploma that certifies prior studies. It is rather a proof of a verified competency and it is obviously based on a well-defined standard. This offers much more transparency to standardized certification systems since it allows workers to know what is expected from them, employers to be aware of the competencies that are being required by their enterprise and training entities to be aided in their curriculum design process. The certificate is a guarantee of quality concerning what the worker is capable of doing and the competencies he/she have to do so.

In designing a framework, care should be taken that only measurable components are included. It is important to restrict the number of competencies required to be acquired for any particular role and arranging them into **Modules or Units of Competency** containing like (similar) topics to make the framework more flexible and accessible to the users (Modular arrangement). The framework should contain definitions and/or examples of each competency.

The Module or Unit of Competency is formed by a group of **Elements of Competency;** it has a clear meaning in the work process and therefore it has value for the work itself. The Module/Unit not only refers to the functions that are directly related to this job's objective, it also includes any other requirement connected with health and safety, quality and relationships at work.

Element of Competency includes the competencies required to be acquired by a person in his/her occupational environment. Therefore, it refers to an action, a behavior or a result that a worker needs to demonstrate and thus it is a **Task** that is carried out by one individual.

The Element of competency includes the description of a Task that should be carried out by workers/trainees in their occupational environment. Therefore, it refers to an action that a worker needs to demonstrate and thus it is the ability to carry out a Task by an individual.

Vocational Qualifications Vs Academic Qualifications

Academic qualifications are addressed by an examination type of evaluation where several procedures are followed. It is a summative assessment in a formal setting used as the main (sometimes) form of assessment. Examinations are held at the end of the term or end of year, it is norm referenced. The examination type of evaluation is norm referenced, comparing a student's performance with other students as an indication of final ranking and for placement/selection. The emphasis is majorly knowledge and recall of memory of content.

Vocational qualifications are addressed by a competence based assessment which is formative and informal assessment. It requires and involves continuous assessment and criterion referenced.

The case of Uganda

The Ministry of Education and Sports (MoES) embarked on reforming Business, Technical and Vocational Education and Training (BTVET) in Uganda. In 2000/ 2001, a multi-stakeholder Task Force prepared a Strategic Plan to establish a "Uganda Qualifications Framework (UQF)". A BTVET Sub-sector Review conducted in 2002 recommended *to* start with the establishment of a "Uganda Vocational Qualifications Framework (UVQF)", and to reform BTVET along the lines of "Competence-Based Education and Training (CBET)".

In February/March 2003, the Strategic Plan for UQF (Task Force) was reviewed/ updated and the establishment of a UVQF was integrated into the BTVET Subsector Reform Strategy/ESIP. The key element of this BTVET reform was the development of a Uganda (Vocational) Qualifications Framework (UVQF) based on a Competence-Based Education and Training (CBET) approach.

The foreseen advantages of CBET include improved access, equity and relevance of BTVET, reduced unit costs of training, Recognition of Prior Learning (or on-the-job-training), among others.

As the Ministry executes its obligation of ensuring quality in training standards, the public-private partnership is being strengthened to improve occupational competence of the country's workforce without gender bias.

Further to efforts to link Education and Training to the real world of work, the Ministry set up the UVQF Secretariat in 2004 to facilitate the anticipated UVQF design and development/piloting of its instruments and mechanisms leading to re-configured BTVET in Uganda.

In December 2008, the BTVET Act 2008 was launched in which UVQF is established by Law.

Why establish a UVQF?

- Lack of the right competencies of the workforce limits productivity and thus competitiveness of Ugandan economy
- BTVET courses do not sufficiently reflect the requirements of the real world of work in Uganda (relevance of certificates and diplomas is questionable
- Access to BTVET is denied for the majority of young people
- Unit cost of BTVET is too high

Purpose of UVQF is to define

- Occupational standards in the world of work
- Assessment standards
- Vocational qualifications of learners who meet the set standards of the different studies provide guidelines for modular training

In establishing the Uganda Vocational Qualifications Framework (UVQF), there are three (3) main stages of development;

1. Occupational profile development
2. Training modules development
3. Test item development

These are compiled in what is called an Assessment and Training Package. These packages act as a guide to both the instructors and institutions of Vocational Education and Training.

By definition, a Qualifications Framework is a unified system of linked national qualifications highly visible, quality assured national system of educational recognition which promotes life-long learning and a seamless and diverse education and training system. The Uganda Vocational Qualifications Framework in essence is a mechanism to define the occupational skills requirements in the world of work (occupational Standards).

- Assess learners against these standards (open-access assessment)
- Award vocational qualifications (certification) to learners who prove that they meet standards
- Provide pathways for progression

Competence Based Assessment

It is a formative and informal assessment which includes continuous assessment as an integral part of the teaching and learning process. It is criterion referenced, which compares students performance against pre-determined criteria/standards to provide feedback and improve performance. The emphasis is placed on outcomes of the learning process.

The Directorate of Industrial Training has been implementing CBA since 2007 with the introduction of CBET which bases on modular training and embraces non-formal/informal training. The Directorate of Industrial Training conducts Competence Based Assessment in two forms;

1. Modular assessment
2. Occupational assessments

The methods used include;

1. Oral questioning
2. Written tests
3. Direct observation
4. Record of continuous assessment
5. Skill demonstration

The assessors are trained to conduct competence based assessment using both written and performance test items, with marking guide which controls any variations in the final awarding of marks.

In competence based assessment there are dimensions characterizing the execution of work which include scope of work, context, complexity, predictability and team work. On the other hand, there are also dimensions of leadership, autonomy, resource control and creation of new concepts.

In order to determine the competence level of an occupation, the dimensions are applied to give a level descriptor. For example for the scope of work in terms of duties and tasks Level 1 is narrow range, Level 2 is moderate range, Level 3 is broad range while Level 4 is full range of the occupation.

In competence based assessment, emphasis is put on both the assessor and assessment instruments. The instruments are developed by a team of practitioners plus the instructors in the particular occupations. In the test item, the criteria for assessment, scoring guide and maximum score are clearly indicated for guidance.

There are specific guidelines that have to be followed to the detail of a performance test such as preferred venue, tools and materials and remarks to both the assessor and the candidate. At the end of the day, the given marks are showing a measure of "How well" the candidate can do the job.

The test medium of communications varies to include local languages. The Directorate awards several types of certificates following the UVQF, Transcript, Worker's PAS, and Certificates for Levels 1, 2, 3. The instructors and managers of vocational institutions are awarded both certificate and Diplomas level IV & V of the Uganda Vocational Qualification.

According to the statistics, in 2009, 3736 candidates were assessed, in 2010, 16,581 candidates were assessed, in 2011, 23,758 candidates were assessed and in 2012, 26,208 candidates were also assessed. A total number of 124,947 candidates were assessed between 2009 and 2014. This shows an increasing demand from skills assessment.

Challenges

1. Generally, there is low quality of training which is attributed to the following
   – poorly equipped training institutions
   - Lack of tools and facilities in institutions
   - Inadequate number of qualified instructors
   - Instructor absenteeism
   - Abuse of internal quality assurance mechanisms affecting validity of accrediting assessment centres
2. Lack of harmonized interpretation of Competence Based Education and Training
3. Lack of harmonized interpretation of the legal framework (BTVET Act 2008)
4. There is a weak Public-Private-Partnership resulting in less participation of industry and private sector in skills development
5. Training levy legislated under the BTVET Act of 2008 not implemented
6. Misalignment of skills training to the labour market demand
7. Defining the pathways that ensure vertical progression
8. At present, facilities conducive to support UVQF assessment from Level III and above can only be accessed in industry support to People with Disabilities in the assessment system i.e. few assessors in sign language, blind etc.
9. Need special attention during assessment to allocate extra time in both practical and theory
10. There are training and infrastructure barriers
11. Inadequate funding to the Directorate to conduct competence based assessment

Shaping and networking with digital media in Further Education: Conceptional and strategic considerations

Christoph Bohne

Abstract

To fulfil the growing challenges on the German labour market in Vocational Education and Training (VET), shaping competence-based and networked teaching and learning is needed. Despite all efforts in vocational science and politics, teaching and learning is still dominated by refresher trainings in a lot of VET institutions. Moreover, there is a lack of full-fledged VET networks. Frequently, learners are not included actively in teaching and learning processes.

The digitalization has entered nearly all areas of society. Although a huge range of digital tools already exists, the implementation in VET proceeds slowly. The use of digital media depends on infrastructural conditions as well as didactic methodical possibilities of educators. Digital media are often used passively for obtaining information or unsystematically. But they do have potential for improving shaping competence-based teaching and learning.

The essay describes basics of shaping competence-based and networked teaching and learning. Potentials of digital media in VET are presented. A media-supported Further Education network for VET educators will be outlined.

Introduction

The great importance of the dual system of VET in Germany's education system and economics is undisputed (BMBF, 2015a, 2016; Hoeckel and Schwartz, 2010). The entire VET system offers several vocational training programmes. About 1.36 Mio. adolescents in 327 professions are trained in the dual VET system (BIBB, 2016, p. 108, p. 119). Apprenticing companies, VET schools and other training centres are involved in apprenticeships. In their empirical analysis, Ebbinghaus

and Krewerth (2014) figured out that the coordinated interaction between the places of learning is in deficit. The interlinking between theory and practice is supposed to qualify apprentices for vocational tasks and participation in society. Further Education should support skilled workers in shaping work and society. Companies are confronted with the challenge to ensure to have enough young skilled personnel.

VET educators who are able to teach and train shaping competence-based, especially in connection with digital media, are needed. Educators have a strong influence on the learning success of learners. It is obvious that teacher training influences the quality of teaching and learning (Kurtz, 2014, p. 251). Qualified and competent VET educators in companies, schools, and other places of learning are essential.

The digitalization is continuing worldwide. According to that, the use of digital media increases in the education sector. Software and hardware products offer a wide range for supporting teaching and learning as well as networking processes. That's why it is recommended to qualify VET educators with digital media and for using them in teaching and learning processes.

Shaping competence-based teaching and learning

A view into the (German) VET practice shows that there are still a lot of refresher trainings. Experiences from the research and development projects *EMAG* (Eicker and Bohne, 2015) and *LAGL* (BMBF, 2015b, p. 55) confirm this. That's why it is urgently necessary to establish further training for VET educators based on shaping competence. This is to meet the high requirements on skilled workers in the world of work and society.

Shaping competence-based teaching and learning is based on a constructivist position and was primarily marked by Heidegger and Rauner (Heidegger and Rauner, 1989; Heidegger *et al.*, 1988; Rauner and Weisenbach, 1984). Since then, shaping orientation and competence have intensively been discussing. Shaping competence always evolves from the shaping space of work, education, society, and politics. Interdependencies between these four corner pillars must be considered with regard to VET and the related vocational science (Fig. 1). In technical domains, the aspect of applied technology enlarges the shaping space. Applied technology means user-oriented technology in VET. Work describes the accrued work in a field of work or in a profession. Education describes the whole teaching and learning processes of educators and learners. Society means the democratic living together with individuals in a region or country. Politics sets up frameworks which regulate the other parts (e.g. Working Conditions Act, Vocational Training Act). In this shaping space learners must (co-)shape. To achieve this shaping process shaping competence is needed.

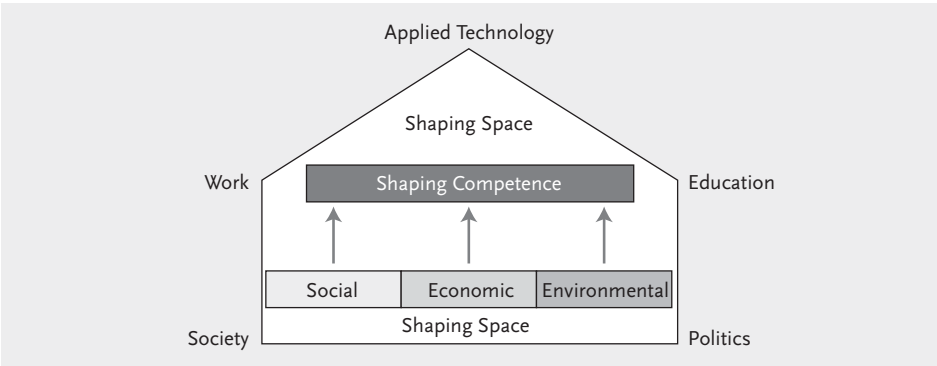

Fig. 1 Shaping Space. Source: Own.

Following Richter and Meyer (2004, p. 23) shaping competence means a targeted influence of the personal, vocational and social environment through own actions. Shaping competence is defined as a polyvalent possibility which solves complex tasks. In the context of social, economic and environmental aspects, learners should weigh up alternatives and consider possible consequences. They should be able to decide for a solution of the task and justify it. Learners are supposed to (co-)shape working and business processes actively. Learning situations and corresponding learning tasks for the development of shaping competence have to be arranged.

In this discourse, the triad *social-economic-environmental* has already been considered, but not explicitly under the mask of VET for sustainable development (BMBF, 2014; Kuhlmeier *et al.*, 2014). Frequently, the word sustainability is unclear and used inflationary. The aim is to create a social, economic and environmental compatible consciousness respectively attitude leading to responsible and reflective (co-)shaping. In the *Brundtland-Report*, sustainable development is defined as "[...] a development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 41). In short with the words of the *German Council for Sustainable Development*: "Today not at the expense of tomorrow, here not at the expense of elsewhere" (Bertelsmann Stiftung, 2014, p. 2).

Networked teaching and learning

Networking can promote shaping competence-based teaching and learning. VET networked teaching and learning is attached a great importance. Jahn and Goller (2015, p. 185) describe the necessity of cooperation in the dual system. Thereby, regional structures should be strengthened and learning processes be supported. Networks are a possible answer to permanent change processes in VET (Kremer, 2004, pp. 82−86). In this context, informal and collective learning are of great significance. Furthermore, learning environment, interests, and experiences of VET players are central (Diettrich, 2015, p. 166).

Networking goes further than cooperating. In a cooperation, each institution respectively individual works separately for itself. Information and knowledge are shared with single institutions. In networking all institutions work together. They feel an advantage and follow a common goal. Accordingly, they must have an intersecting set in their usual working and learning tasks. Based on market demands and chances, tasks have to be determined and justified. VET players must be willing to reorganize their consisting internal working and learning organization/behaviour, so that outward-directed connections can evolve. A network initiator and moderator is required (Eicker, 2009, p. 124). This moderator primarily fulfils network and administrative tasks (Elsholz, 2015, p. 180).

Because of the variety of network typologies (Diettrich, 2015, p. 168; Elsholz, 2015, p. 172) the term *Further Education Network for VET Educators* (FEN-VET) is proposed in this context. Such a network stores informal qualification potentials for competence development. This raises the question how networks have to be shaped for working permanently and improving professional VET actions. Efficient networks have a high interactive intensity. They are also characterised by a relationship of trust between the VET players and strong self-organizational skills. The network and its learning concept have to be dynamic, flexible, and attendee-oriented (Diettrich, 2015, p. 168).

Potentials of digital media

Digital media can promote shaping competence-based and networked teaching and learning. E-learning is often attributed to self-determination of learning time, place of learning, learning speed, and learning style (Erpenbeck *et al.*, 2015, p. 1). One disadvantage is the missing personal contact and social exchange. As a result of the pilot project *FuTEx*, Littig (2015, p. 247) establishes that physical phases are essential. Thus, future-oriented blended learning (Pachner, 2009) has been attested the highest priority in organizational learning (mmb-Institut, 2016). Both formats have in common that a didactic methodical analysis as well as a teaching and learning concept are needed. Important for the success of learning is the linkage of current skills and experiences (Erpenbeck *et al.*, 2015, p. 7). Relevant working tasks have to be transferred to shaping competence-based learning tasks. Thereby, user generated content plays a major role.

Howe and Knutzen (2013, pp. 18–35) identified possible applications of digital media in technical vocational apprenticeship. They show six categories accompanying working and learning tasks with the help of digital media:

1) *Provision of information and contents*

   Educators and learners have the possibility to provide working and learning relevant materials in the internet.

2) *Visualize, animate, and simulate*

   Working and business processes could be visualized realistically in videos in real time. Animations can present complex or not visible processes in a simplified way. Simulations enable to steer technical machines safely by influencing parameters.

3) *Communicate and cooperate*

   With the help of tools like weblogs, forums or chats, educators and learners are able to communicate and cooperate independently of time and place.

4) *Structure and systemize*

   The high density of information and the complexity of the world of work and profession make structured and systematic processes necessary. Tools like *Evernote* enable to integrate digital artefacts and lead learners to a structured system.

5) *Diagnose and testing*

   Audience response systems are suitable to check the stage of learning anonymously via the learner's own tablet or smartphone. As a result, educators can influence the steering of the learning process. Moving images and simulations can be implemented as the basis of shaping-based exams.

6) *Reflection*

   Portfolios facilitate to reflect the learning process. Diverse artefacts can be uploaded and tagged. This leads to linkages and with it to a chain-like reflecting process.

The categories above were modified for a FEN-VET. Digital media enrich a FEN-VET by considering working and learning tasks including contents as the central elements of the network. Digital media are established on a macro and a micro level (Fig. 2).

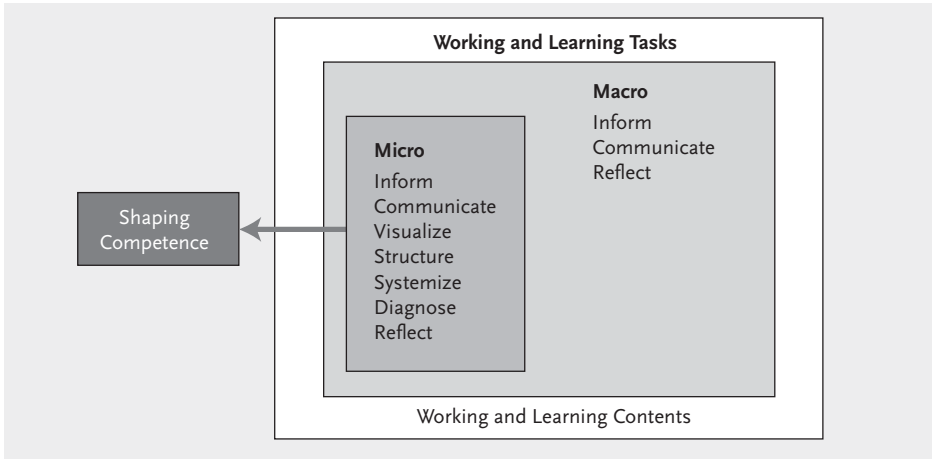

Fig. 2 Digital media in a FEN-VET. Source: Own. Referring to Howe and Knutzen, 2013, pp. 18–35.

The macro level serves networking. VET players mainly inform, communicate, and reflect their actions. To get to the micro level, the macro level has to work fundamentally. The micro level serves possible connections of digital media in teaching and learning processes. This level addresses VET educators and learners. Both levels contain media supported processes. Digital media should be tested and evaluated in the network in own learning processes. VET educators develop 'VET media competence', which can be re-examined in VET practice. Learners always have to be involved in the learning process for developing shaping competence.

Networked Further Education with digital media

With the contained multi-professional consolidating competence of VET players, a FEN-VET can lead to a higher quality of teaching and learning. With the help of shaping competence-based teaching and learning, individuals are able to develop shaping competence. This process can be enriched with digital media (Fig. 3).

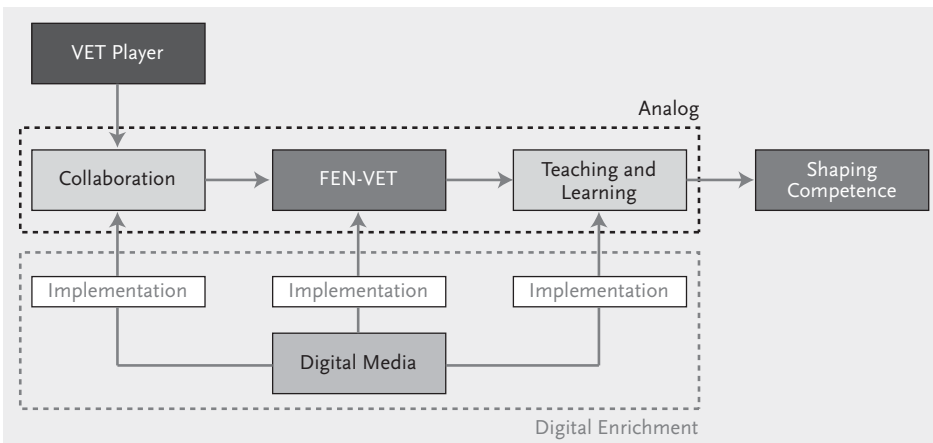

Fig. 3 Digital Networking. Source: Own.

To initiate a FEN-VET, a strategy is needed. Complex network-related teaching and learning processes have to be planned, executed, and evaluated. At the beginning, potential VET players are present who work and learn isolated from each other. A network initiator is required. He or she has to overtake the implementation of the network proactively. Regional conditions have to be examined. Experiences show that especially in companies, competitive thinking exists. Therefore, an initial analysis has to point out the benefit of a collaboration towards an isolated working. Moreover, the connection with current networks and interfaces has to be considered. The connection to a current regional VET player team is useful (e.g. schools, companies, universities). Initiators must be convinced of the implementation of a FEN-VET and prepared to collaborate according to their possibilities. Thus, a mutual benefit must be available. This advantage is mainly present in the

informal Further Education of VET educators and in the increasing quality of VET practice. Potential VET players have to be approached strategically and they should benefit of a FEN-VET. Common contents, interest, and tasks motivate the union. From the beginning, potential VET players have to feel an individual advantage. A high commitment, long-term engagement, and openness are necessary. Competences of the network initiator are requested.

Initial communication processes arise by acquisitioning new VET players. Digital media is useful for informing and communicating. Fundamentally, digital media have a positive effect on the publicity of the network initiative. Moreover, they facilitate the search for potential VET players. A FEN-VET information site could be linked in VET portals. A representative website with required information about the FEN-VET is helpful. Simple websites can be realized without the knowledge of programming with the help of open-source-software like *Jimdo* or *WordPress*. If long distances between VET players exist in rural or structural weak regions, personal contact is difficult. Ways of communicating are reduced to phone and e-mail. For the initial contact, communication via phone is recommended. If something new is initiated and uncertainty exists, an informative website contributes to union. Potential VET players often prefer a *(digital) picture*.

If some potential VET players have already shown their interest and assured their collaboration, intensive communication and collaboration processes take place. Collaboration means networked interactions of VET educators in vocational working and learning. At this stage of development, it is not an efficient FEN-VET but a basis network. As soon as central aspects of network acting have been agreed on, organizational steps derive from it. A platform for network-related professionalization of VET educators should be worked out and justified. A lot of open educational resources like the learning management systems *Moodle* or *ILIAS* are available. Useful structures have to be created. From the technical perspective features like extendibility, interoperation, and scalability should be paid attention to. Besides the following main categories, it is reasonable to post latest news on the home page. This includes the option to subscribe a newsletter.

- Latest events (workshops, conferences, congresses, seminars)
- Tasks (relevant working and learning tasks including teaching and learning practice)
- Contents (education policy, vocational scientific and vocational educational contents)
- Staffroom (contacts to FEN-VET-members, private discussions)
- Publications (a list of relevant publications being linked or uploaded as PDF)
- About FEN-VET (presentation of the network, central idea, members, contact).

Sub-categories are, of course, possible. The platform pursuits a practical holistic Further Education process. It is important to emphasise that different competences cannot be developed isolated. Shaping competence-based teaching and learning can also lead to an adequate quality without digital media. *Digital learning* which does not focus on shaping competence is usually from a lower quality. That

means, the basis for *digital learning* must be shaping competence-based. Above all, the process from working to learning has to be justified and reflected. With reference to working and learning tasks vocational scientific and educational contents have to be worked out, analysed, and reflected. Digital media *only* offer the possibility to enrich this learning with the help of different tools. Experiences from the research and development projects *EMAG* and *LAGL* have shown that the satiety of tools and contained functions often complicate the selection and use of digital media. Digital media open up new possibilities in teaching and learning (e.g. with the help of augmented reality and wearable computing). The consideration which tools and functions are able to contribute to a shaping-oriented solution of a task should be prioritized.

Digital media, which have been used as realization and shaping tools and proven effectiveness, are recommended in a FEN-VET. Intuitive operable tools with the option to deactivate not useful functions are prioritized. For example, in a forum you can discuss about documented learning situations and worked out learning materials. By means of web-based app sharing, learning situations can be developed in real time. In a webinar, new technical artefacts in companies can be presented. Scientists could produce a podcast with *Garageband* containing their central findings of empirical research. Curricula at schools could be elaborated and discussed in a *wiki*. E-portfolios provide the opportunity to document and reflect the learning process of VET educators. Following Wiesenhütter and Haberer (2015), a network-opened and practical MOOC (Massive Open Online Course) with the topic 'VET for sustainable development' might be useful. Digital media should be tested and discussed in the network before implementing them into VET practice.

The integration of media-supported learning in VET institutions is a measure of organizational development. This means a change process. Usually this process does not run without resistance. Hence, possible resistance and conflicts have to be discussed and solutions have to be found as soon as possible. In the past, it has often been shown that digital media could not be implemented in practice. Reasons were insufficient media competence, inadequate digital infrastructure, poor usability, missing interest, insufficient advantage, and the opinion that digital media means an additional workload. Individuals will seldom be able to establish an innovation. Thus, it is recommended to form coping groups (Erpenbeck *et al.*, 2015, pp. 18−23). With the implementation of digital media, the interests and preferences of learners must be considered. If this does not happen, learners could become afraid of reforms, loss or competence deficits. Therefore, a FEN-VET should offer support, e.g. in form of blended coaching (Bohne, 2014). At least three regional or national presence meetings are suitable. The VET players should get the opportunity to meet each other personally. This strengthens the FEN-VET. Besides VET educators, skilled workers, and apprentices should also participate. These people are able to bring in valuable feedback from the perspective of learners.

Conclusion and prospect

Initiating a FEN-VET is a challenge, especially if competitive thinking or even discrepancies exist. The FEN-VET's aim is to achieve a wide-changing in the learning culture leading to a new quality in teaching and learning in VET institutions. A FEN-VET is suitable for practice-oriented learning and lives from the give-and-take of the VET players. Due to the persistent dynamic in VET, lifelong learning and with it media-related learning is omnipresent. The huge workload and missing learning time of VET educators leave room for improvement by employers and politicians.

To prove the effectiveness of a FEN-VET, empirical evidence is needed. Benefits of e-learning and blended learning with regard to learning efficiency and profitability could be proved in the development cooperation. Inter alia, the Further Education programme *ELDI* has been developed in Namibia and is offered worldwide (f-bb, 2011). In Sub-Saharan Africa, a FEN-VET could promote vocational teaching and learning across country borders, and also across continents. Finally, apprentices should be prepared as best as possible for the outlined shaping space. Every individual who participates in VET has to invest openness and engagement to achieve a change in the learning culture.

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Learning and Exchange Platforms: An Approach to professionalise TVET trainers in Namibia?

Silke Partner

Abstract

The acute shortage of skilled labour in most sectors in Namibia is linked to inadequate access to and poor quality of training programmes, often related to lack of practical skills of trainers. This shortage is affecting the growth potentials of the Namibian economy. The Namibian Government has recognised the existing gaps and is working within the framework of the National Development Plan (NDP 4), to develop a high quality technical Vocational Education and Training and training of trainer system.

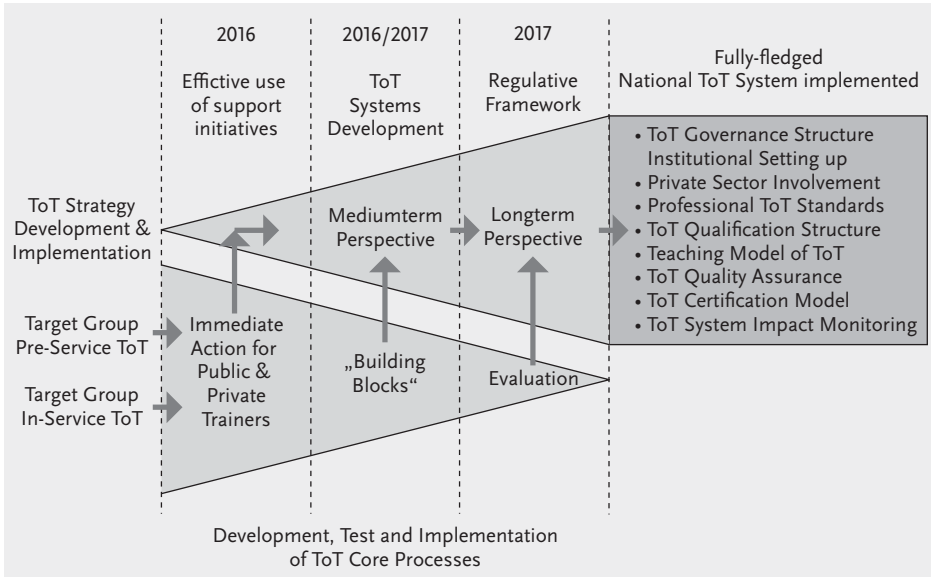
The results of a needs analysis and competency assessment of in-service TVET trainers conducted by the Namibian Training Authority (NTA) shows a lack in mainly technical skills and industry exposure. Trainers are currently systematically taking part in national, regional and international programmes to improve their technical skills, coupled with trade specific pedagogics, industry exposure and cross-cutting issues.

The NTA supported by GIZ-ProVET Programme on behalf of the Federal Republic of Germany has introduced learning and exchange platforms to create more favourable conditions in the process of building capacity in the TVET sector. Trainers use them to share their learnings from those programmes, including reflections on technology, teaching techniques and reform recommendations with other trainers in the field. This way, the trainers themselves take ownership of their learning process and become responsible for their continuous professional development as they establish communities of practice. These platforms enhance the impact of the upskilling programmes leading to a TVET system focused on the teaching and learning processes related to the workplace and its effectiveness. Subsequently the trainee is assumed to acquire better workplace related skills and occupational competence.

Background

Although Namibia is defined as upper-middle income country (according to the World Bank), almost one third of the population of 2.1 million lives below the poverty line, with 4 % living in extreme poverty. One of the main factors related to poverty is the high unemployment rate, which officially stands at 27.4 % (LFS 2012), with women and young people being mostly affected. At the same time, there is an acute shortage of skilled workers in most sectors due to inadequate access to and poor quality of training programmes. This shortage is also affecting the growth potentials of the Namibian economy as well as the sector's contribution to facilitate the transition to a knowledge-based economy. The Namibian Government has recognised the existing gaps in Vocational Education and their impact on the economy. It is working within the framework of the National Development Plan (NDP 4), to develop a high quality education system in order to achieve the main targets of employment promotion, sustainable economic development and a reduction of income inequality (2012/2013 – 2017/2018).

The National Skills Development Plan, commissioned by the Namibian Training Authority is the guiding framework for investing in skills development priority areas. It identifies occupations in high demand for each industry sector which are necessary to create a demand-driven TVET system. One major constraint for a quality delivery of high quality and demand oriented training programmes at public and private training providers however remains the level of current trainers related to the changing demand and technology development of the labour market. They lack technical skills, industry experience and knowledge of recent reforms within the vocational training system in Namibia, e.g. with regard to the introduced competency based training and assessment approach. At present there is no pre-service or in-service training programme that is designed to meet the skills development needs of trainers in Namibia. Up-skilling of trainers and strengthening the management capacity and the quality of the VET system therefore remain priorities of the current reforms and are currently organized in ad-hoc responses to short term needs.



Training of Trainer (ToT) system development approach in Namibia (own source)

Learning and Exchange Platforms

Improving the quality of TVET means improving the delivery and therefor the quality of training of trainers in TVET (ToT). A national ToT system in Namibia is currently being developed according to national priorities within the current TVET reforms such as the NTA VET expansion plan, revision of the VET Act as well as the funding of priority needs through the recently introduced VET levy. Short-term trainings are being supported for trainers utilizing international and regional partnerships and procured from Namibian and regional training institutions. Often these are stand-alone initiatives and trainers are being sent back to their workplaces without being able to translate the content of such training into their everyday work or the opportunity for lessons learnt to be fed into the development of a ToT system.

In February 2016, 12 practical TVET trainers in the field of automotive (Auto-Mechanic & Auto-Electric) have attended a six week training programme outside of the country. In order to evaluate the training and organise the debriefing of the trainers, NTA together with GIZ-ProVET Programme on behalf of the federal republic of Germany has introduced the "Community of Practice for Automotive Instructors" (CoP) for all Auto-Mechanic & Auto-Electric trainers.

As part of NTA's overall objective to promote exchange, cooperation and collaboration between stakeholders through capacity building support, the workshop was one of several interventions aimed at promoting an environment that enable learning and exchange.

Even though expected results of learning and exchange platforms can vary, they should follow certain ground rule:

- it is a place to learn
- it is a place to exchange relevant information
- it is being used to share information and to analyse information and develop operational plans
- it is being used by staff members of the NTA to gain field information and stakeholder engagement
- it is beneficiary to all participants in regards to expand knowledge and competence
- it is introducing a learning network for trainers in specific trade/occupation

To organise this particular debriefing following steps have been used based on the GIZ management tool Capacity Works and has since then been adapted by the relevant NTA divisions.

1. Establish why the debriefing workshop is being carried out and identify the issue to be examined

The scope and structure of a debriefing workshop will depend on the reason why it is being carried out and the issue to be examined. Therefore, you should clearly state the benefits of debriefing in the invitation, so that all participants are clear about its purpose. There may be a particular issue that the workshop needs to address. The more clearly you communicate the reason for the workshop and the issue it will examine, the more productive the debriefing process will be.

2. Collect successes and problems

The individual participants recall successes and problems that occurred in the course of the project and each participant then writes these down on cards. In complex projects, you can carry out debriefing for parts of the project (e. g. lines of action, work packages). When they pin up their cards, you should give each participant an opportunity to comment on the successes and/or problems in front of the plenary group or to pin them up without comment, or hand them to the moderator anonymously for him/her to pin up. Alternatively, have the moderator collect the participants' feedback by email prior to the workshop. This step generates a revealing map of successes and problems that already highlights critical phases or events at a purely visual level. It also reveals whether the participants perceived the same events as key successes or problems.

3. Cluster successes and problems and define lessons learned

In this step, the moderator pools the successes and problems into similar categories together with the participants.

4. Draw conclusions and define activities

In this step, you ask yourself what approach the project needs to take in order to meet the needs of the objectives system. The aspects discussed in the previous

steps allow you to document recommendations for the project's steering (structure) in line with the five success factors. It is useful if you map these recommendations on a pin board, focusing on the objectives and results. Try to cover all five success factors. Based on the outcomes achieved so far, you now invite all participants to discuss and develop activities and recommendations.

5. Document lessons learned

In this step, the moderator documents the lessons learned and hands them over to the project. They serve as a basis for deciding on the project's future orientation and for learning from the experiences, successes and problems of the past.

Debriefing has always an operational and educational component. Thus this could be used to be beneficial to all topic related trainer in the country. Hence an exchange platform (community of practice) could be used for the purpose of debriefing and knowledge exchange between NTA operational staff members, respective trainers and the individual trainer who went on a training intervention.

Out of this first debriefing process a community of practice (CoP) for automotive mechatronics trainers in Namibia has been formed. The CoP with support of ProVET and NTA has up engaged into a partnership with a German training institution that avails trainers to Namibia in intervals to give input theory and practice training based on project work over a longer period of time. In between the automotive trainers themselves overcome shortcomings of the current curriculum and material with establishing peer-learning and peer-coaching sessions. They learn to reflect on their role of a trainer, their responsibilities and how to set up and tackle real issues from workplaces in a project-based approach, which they can then also apply in their teaching environment.

Feedback from the trainings in the community of practice has been positive:

"It was good to bring up this idea of Learning and Exchange Platform for the first time."

"It was a good lesson. I have learned and I will bring that practice back to my centre."

"Sharing of information on how to improve the system."

"Good of sharing the ideas from the ToT."

"Such platform must take place as it helps people to see in which direction we are going or want to go."

"The discussion platform was very good because it allows everyone to participate."

"The training was productive; I learnt a lot to improve my training skills."

"The programme was perfect, I have learned a lot from the others."

"The World Café was good, first of its kind, train the trainer – good stuff."

"Organize trainer interventions periodically."

A next CoP has been set up for electrical general and plumbing with always one vocational training centre taking leadership in hosting the CoP.

The Namibian Training Authority has since then taken full ownership of building communities of practice among their TVET Trainers and organizing learning and exchange platforms in various ways in order to become even more effective and identify national master trainers, who in future can coach and train trainers in Namibia.

> *Communities of Practice are a non-hierarchical, practical form of learning for sharing knowledge and experience. Individuals with shared interests exchange information on a training intervention and a defined area of specialisation and generate new knowledge together. A community of practice (CoP) is a group of individuals who share an interest in a common field and join forces to actively exchange practical knowledge and experience over a long period of time and to generate new knowledge together. Participation is voluntary and cannot be delegated. CoP trigger collective learning processes that generate knowledge and experience that is continuously developing.*

Conclusion and recommendations

For the relatively small number of technical TVET trainers in Namibia, the exposure in short term trainings has been very successful, when they are well prepared and followed up. Especially for specialised, newly introduced and innovative trades, short term interventions and/or the use of regional training programmes to upskill the trainers will remain an integral part of the training of trainer initiatives in Namibia. The debriefing process together with the forming of communities of practice, initiating peer learning processes and finding a hosting institution for a specific trade has proven very useful and will therefore be continued as part of the Namibian Training of Trainer system. TVET trainers in Namibia are the backbone of practical training while the country is developing workplace-based training approaches. Therefore the role of the trainer, his/her professional development process as well as better networking and cooperation between trainers and vocational center management has to be well defined and used in order to ensure professionalization of training staff of the country.

The common purpose, composition of the CoP and the feedback of results into a national dialogue on professional development of TVET trainers has to remain key to all learning and exchange platforms. If the outcomes of training programmes are communicated within the respective institutions and followed up, resources are allocated in advance in order to ensure participation of all stakeholders and Training institutions can become even more responsive to requests to offer training programmes for TVET trainers in the country.

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Promoting effective Work Integrated Learning (WIL) and Recognition of Prior Learning (RPL) practices in the TVET sector through research

Nothemba Joyce Nduna

Abstract

There is a growing interest in increasing research capacity in South African public Higher Education Institutions (HEIs) in general and in Universities of Technology (UoTs) and Technical and Vocational Education and Training (TVET) Colleges in particular. As part of its strategy to increase research capacity, the Education, Training and Development Practices – Sector Education and Training Authority (ETDP SETA) has established six Research Chairs in six public HEIs. This article introduces the work of the Research Chair for Work Integrated Learning (WIL) and Recognition of Prior Learning (RPL) that was established by the ETDP SETA in August 2015. The purpose of introducing the work of the Research Chair is to explore possibilities for research collaborations and partnerships with a variety of stakeholders at local, national and international levels. The article is divided into five sections. The first section is an introduction which provides the context, focus and purpose of the Research Chair. This section also highlights the need for research into WIL current practices and WIL staff development needs and advocates for the development of WIL related HEQSF qualifications in the TVET sector. The second section provides an overview of literature on WIL and RPL and relates the work of the Research Chair to the 2013 Policy on Professional Qualifications for lecturers in TVET and *the 2015 Draft RPL Policy for the Higher Education Qualifications Sub-Framework (HEQSF)*. The third section deals with the research methodology that covers the research questions, intended outcomes and data collection processes that were involved. The fourth section discusses the research findings and enabling factors for the Research Chair. The final section provides a summary of the findings and calls for research collaborations.

Introduction

Research Chair's Context and Background

Effective and efficient WIL and RPL practices have never become more critical than the present time when South Africa is faced with challenges that include high unemployment rates, alarming youth fallout and drop-out rates in the education system, low levels of skills, declining economy and declining quality of the education system. These challenges have resulted in a growing interest in increasing research capacity in South African public Higher Education Institutions (HEIs) in general and in Universities of Technology (UoTs) and Technical and Vocational Education and Training (TVET) Colleges in particular. As part of its strategy to increase research capacity, the Education, Training and Development Practices – Sector Education and Training Authority (ETDP SETA) has established six Research Chairs in six public HEIs. One of the Research Chairs that was established by the ETDP SETA in August 2015 is for Work Integrated Learning (WIL) and Recognition of Prior Learning (RPL). The ETDP SETA Research Chair Initiative (RCI) is therefore a knowledge and human resource development intervention aimed at strengthening and improving the research capacity of the ETDP SETA to produce high quality research and post graduate students for the Education, Training and Development (ETD) sector and to provide technical research support and capacity to the ETDP SETA to deliver on sector focused research.

The challenges mentioned above have also resulted in the development of several national policy documents that highlight the need for economic growth and social development (Department of Higher Education, 2011). Such need requires an adequate supply of graduates that have appropriate attributes and work-related competencies (Department of Higher Education and Training, 2014). This means that the role of Post-School Education and Training (PSET) institutions (TVET colleges, private FET, Community Colleges and HEIs) is crucial (Fraser, 2014). These institutions are expected to demonstrate responsibility and commitment to socio-economic development through developing programmes that are responsive to economic, social, political and cultural needs of the country (Department of Education, 1997). Central to the development of graduate attributes and students' work related competencies, is staff capacity development in terms of WIL and RPL through partnerships with industry, universities, government departments (Setas) and other relevant stakeholders.

Focus and Purpose of the Research Chair

The target population for the Research Chair is staff that is involved in WIL practice in the Technical and Vocational Education and Training (TVET) sector. The intention is to identify WIL and RPL staff needs as well as staff WIL practices and challenges and investigate how an attempt can be made to address such needs and challenges when formal HEQSF aligned qualifications that have a WIL component, are developed and implemented in partnership with industry and other

relevant stakeholders. The need to develop such qualifications is documented in the 2013 Policy on Professional Qualifications for lecturers in TVET which will be implemented from 2017 (RSA, 2013). The purpose of the Research Chair is to facilitate a planning process that will enable the implementation of this policy and other RPL policies that are related to WIL by 2018.

The Research Chair therefore aims at building knowledge about the TVET sector, and in particular, the contribution of WIL to the training that the sector offers. This includes the role of WIL in preparing staff to engage meaningfully with the world beyond the TVET College. Understanding the relationship between academic study and learning within the world of work is key to building knowledge in the field of work integrated learning. The Research Chair also aims at formulating recommendations towards transforming the TVET sector and providing staff development opportunities through formal qualifications. It is envisaged that the Research Chair would also benefit the staff and students of other partners involved in the project, in terms of research capacity development.

The need for WIL and RPL research

Research into WIL staff development needs and interventions that include the development of formal WIL-focused qualifications needs urgent attention. Effective WIL staff development could enable staff to plan, implement, assess and monitor WIL, manage WIL partnerships and conduct WIL research effectively and efficiently. Students that benefit from receiving such high quality WIL, could develop employability skills and attain graduate attributes that could make them employable and even self-employable. Employable graduates could raise the productivity of the formal and informal sectors and have a contribution that could have a significant impact to socio-economic growth and social development. Research on the development and implementation of WIL staff development programmes and qualifications as well as on alternative access to WIL staff development programmes and advancement of staff within WIL qualification programmes is therefore necessary. It is against this background that the Research Chair for WIL and RPL is operating. The work of the Research Chair is introduced to explore possibilities for research collaborations and partnerships with a variety of stakeholders at local, national and international levels.

Literature overview on WIL and RPL

Research Chair's Definition of WIL

The Research Chair's definition of WIL is drawn from the WIL definitions of both the Council on Higher Education (CHE) and the Higher Education Qualifications Sub-Framework (HEQSF).

The Council on Higher Education (CHE, 2011), defines WIL as an umbrella term that describes curricular, educational and assessment practices, across a range of

academic disciplines that integrate formal learning and workplace concerns. The integration of theory and practice in student learning is seen as occurring through a range of WIL approaches. Examples include: action-learning, apprenticeships, cooperative education, experiential learning, inquiry learning, inter-professional learning, practicum placements, problem-based learning, project-based learning, scenario learning, service-learning, team-based learning, virtual or simulated WIL learning, work-based learning, work experience, workplace learning, and so on. This means that WIL can be practised in different ways for different contexts and purposes.

With the introduction of the revised National Qualifications Framework as a single integrated system comprising of three sub-frameworks, work-integrated learning is also included as an integral component of various vocationally oriented qualifications (CHE, 2013:16, 27, 28, 29, 32) in the Higher Education Qualifications Sub-Framework (HEQSF).

Work-integrated learning in the HEQSF is defined as follows:

> WIL is characteristic of vocational and professionally-oriented qualifications, and may be incorporated into programmes at all levels of the HEQSF. In the HEQSF, WIL may take various forms including simulated learning, work-directed theoretical learning, problem-based learning, project-based learning and workplace-based learning. The selection of appropriate forms of work-integrated learning depends on the nature and purpose of the qualification type, programme objectives and outcomes, the NQF level at which the WIL component is pegged, institutional capacity to provide WIL opportunities, and the structures and systems that are in place within professional settings and sites of practice to support student learning. Where WIL is a structured part of a qualification, the volume of learning allocated to WIL should be appropriate to the purpose of the qualification and to the cognitive demands of the learning outcomes and assessment criteria contained in the appropriate level descriptors. (CHE, 2013:16)

WIL is seen as an important element in the learning repertoire as it provides key opportunities to explore the world of knowledge at the nexus of theory and practice (CHE, 2011). It contributes to graduate maturation and work-preparedness, and in the South African context it improves employability.

Research Chair's Definition of RPL

The Research Chair's definition of RPL is drawn from the draft RPL Policy developed by the CHE in March 2015 to guide the implementation of RPL in higher education. The CHE defines RPL as the "process through which non-formal and/or informal learning are measured, evaluated and "translated" into their perceived formal equivalents for recognition across different contexts. The intended outcome is the recognition of such prior learning for the purposes of alternative access and admission to higher education learning programme, or for advancement within qualification programmes. The draft policy further states that RPL processes and

Credit Accumulation and Transfer (CAT) and/or articulation are all closely related to assessment practices and together, these three elements enable individuals to move within and between non-completed qualifications on the HEQSF as envisaged in the NQF Act 67 of 2008. RPL is seen as the process for facilitating access to, and mobility and progression within education and training and career paths, (section 5 (1) (b) of the NQF Act); and also for accelerating the redress of past unfair discrimination in education, training and employment opportunities (section 5 (1) (d) of the NQF Act). RPL is therefore viewed as a process for providing alternative access and admission to higher education learning programmes, or for advancement within qualification programmes.

Policies that inform the Research Chair

The work of the Research Chair for WIL and RPL is underpinned by the following policies:

The Policy on Professional Qualifications for lecturers in TVET

This is the policy on Professional Qualifications for lecturers in TVET **that has been published by the Department of Higher Education and Training (DHET) in 2013.**

According to this policy, the lecturers are central to the educational activity in institutions that offer TVET. Sufficient, appropriately qualified and competent lecturers, who understand and have expertise in both the academic and work-related dimensions of TVET, are needed if the institutions that offer TVET programmes are to make the critical contribution expected of them (RSA, 2013: 3).

This policy takes into account the following:

- Lecturers are needed for all the subjects offered in TVET and lecturers need to be able to teach across the different NQF levels within their subject or field.
- Lecturers who teach TVET courses need to be competent in both the theoretical and practical aspects of the courses that they teach.
- A strong workplace component must be built into lecturer qualification programmes for programmes that prepare lecturers to teach the practical or workshop-based components of programmes, in order that lecturers are able to prepare learners for the demands and requirements of the workplace.
- Curriculum offerings in TVET institutions change as workplace demands change (for example, in response to the development of new technologies). Qualification programmes must also be able to respond flexibly and dynamically to industry-driven change. (RSA, 2013: 8)

According to this policy, lecturers' certification and professional development should include WIL both in teaching settings and industry-based settings (RSA, 2013: 15).

The policy places emphasis on the importance of integrating and applying different forms knowledge when the lecturer qualifications are developed. Such forms

include disciplinary learning, pedagogical learning, practical learning, situational learning and fundamental learning.

It is further stated that All TVET lecturers need to have up-to-date knowledge of the application in, and relevance to, the workplace of the subjects they teach ... to match developments in the field (RSA, 2013: 10).

With regard to RPL the policy states that:

Many of the students, who will enter TVET programmes, will be already practicing as TVET lecturers and/or have other prior qualifications and/or have gained substantial experience as a result of learning/practicing in the workplace. It is possible to recognize relevant prior learning that is already in place. A key principle that must inform RPL practice is that learning outcomes must not be compromised as a result of RPL practice. It must also be noted that, in terms of credit accumulation and transfer (CAT), not more than 50 % of the minimum credits contained in the new qualification can be recognized as prior learning (RSA, 2013: 14).

The 2015 Draft RPL Policy for the Higher Education Qualifications Sub-Framework (HEQSF)

The RPL related activities of the Research Chair will also be guided by the RPL Draft Policy that is being developed by the Council on Higher Education (CHE) to guide the development and implementation of RPL across the post-school education and training system, and across all levels of the NQF. The CHE (2015) provides a number of guidelines for the application of RPL within higher education.

At the moment, the Research Chair is guided by the policy on Professional Qualifications for lecturers in TVET **that** provides the following guidelines for RPL practice:

- For prospective students holding **relevant** prior qualifications, it is possible to provide recognition for credits earned in the prior qualification, provided that there is equivalence between the learning for which credits have been achieved in the prior qualification and the learning that will be 'credited' in the new qualification, both in terms of the learning content and the NQF level at which it is pitched; taking into account that what is recognized does not exceed 50 % of the credits in the new qualification.
- Prospective students who have completed the [30-credit] Vocational Education Orientation Programme (VEOP) can be given recognition for the credits making up the VEOP for similar learning in the new qualification.
- Prospective students who have undergone substantial learning in the teaching workplace or the industrial workplace as a result of meaningful workplace experience can present themselves for Assessment of Prior Learning (APL), against learning outcomes stipulated in the qualification for which they wish to register. Students cannot in this way be granted recognition for more than 50 % of the credits for the qualification for which they wish to register.

Importance of Partnerships

Literature indicates that there is enthusiasm around the world for greater participation and active involvement of the wide variety of interest groups in order to address the social and economic needs of the people (Teichler 2000; Foster and Stephenson 1998; Garrick and Kirkpatrick 1998; Teichler 1998; Birch 1988). Such enthusiasm stems from a belief that co-operative generation and application of knowledge and expertise could contribute to finding solutions to local, national and international demands. It is believed that higher education in partnership with communities, local and provincial governments, the private sector and international partners could play a major role in socio-economic development.

A review of research from Canada, United Kingdom and New Zealand also indicates commitment of the various governments in establishing sustainable partnerships for effective economic growth and community development (Craig, Dashfield and Thomson 2003). In Canada, the Community Access Programme (CAP) recommends that partnerships should be active, stable and multiple-source funded. In the United Kingdom, the government has committed to partnership with community groups and in New Zealand, the government has recently committed to working closely with the community sector (Craig, Dashfield and Thomson 2003).

Research methodology

Theoretical Framework

The Research Chair adopts the key theoretical constructs that underpin the notion of WIL. These include constructs that theorise the transfer and recontextualisation of knowledge as it moves in complex ways between university and workplace settings (Eraut 2004). The work of Activity theorists (e.g. Engestrom 2001) is used to enhance an understanding on how work and academic knowledge may be integrated as a platform for WIL in the process of developing WIL staff related qualifications.

Research phases or projects

- Understanding current WIL practice and WIL staff capacity development needs (including RPL) in the TVET sector (September 2015 – July 2016).
- Investigating Curriculum Development Processes, Partnerships and Policies for WIL staff related qualifications in the Post School Education and Training (PSET) sector (August 2016 – July 2017).
- Understanding RPL Policies and assessment practices and processes for Early Childhood Development (ECD) and Community Development Qualifications in the TVET sector (August 2017 – July 2018).

Research Questions for Work Integrated Learning (WIL)

The Research Chair will seek answers to the following research questions:

1. To what extent are TVET lecturers currently prepared for teaching WIL in industry settings in their particular TVET context? (i.e., in terms of curriculum, teaching, learning and assessment)
2. What are the existing practices with regard to the implementation of WIL in industry settings in the TVET context? (e.g., placement practices, partnership management, workplace accreditation, monitoring and evaluation)
3. What are the specific educational and workplace needs of TVET lecturers?
4. What is the current capacity of TVET lecturers to conduct educational research/evaluation in a WIL context?
5. To what extent are current TVET practices aligned with industry/workplace concerns, practices and needs?
6. To what extent are educational technologies used to enhance WIL practice in TVET?

Research Questions for Recognition of Prior Learning (RPL)

The activities of the Research Chair will contribute to national processes and procedures that have been planned to provide answers to questions that include the following:

1. What are the specific RPL needs of TVET lecturers?
2. Which prospective students (students could be practicing TVET lecturers) have other prior qualifications and/or have gained substantial experience as a result of learning/practicing in the workplace?
3. Which prospective students have completed the [30-credit] Vocational Education Orientation Programme (VEOP) that can be given recognition for the credits making up the VEOP for similar learning in the new qualification?
4. Which prospective students have undergone substantial learning in the teaching workplace or the industrial workplace as a result of meaningful workplace experience that can present them for **assessment of prior learning** (APL), against learning outcomes stipulated in the qualification for which they wish to register?
5. What progress has been made in relation to RPL implementation across the TVET sector?
6. What is the quality of RPL implementation?
7. What are the barriers to RPL implementation?
8. How can RPL be further developed and implemented effectively and efficiently on a wide scale across the TVET sector?

Intended outcomes of the Research Chair

The following outcomes are intended to be achieved as a result of the research currently underway.

1. To contribute to knowledge in vocational and professional education through RPL and WIL partnerships.
2. To formulate recommendations towards transforming the TVET sector and providing opportunities for TVET College staff to facilitate WIL effectively and efficiently.
3. To add insights and depth to knowledge of WIL in TVET curriculum and practice, and contribute to national plans for TVET college staff development through formal qualifications.
4. To benefit the staff and students of other partners involved in the project, in terms of research capacity development.
5. To build knowledge in the field of RPL and WIL in order to enhance an understanding of the relationship between the academic world and the world of work.
6. To strengthen partnerships between UoTs, TVET Colleges, workplaces and other stakeholders in terms of WIL and RPL.
7. To encourage collaborative action for the promotion of WIL and RPL within higher education institutions, and at regional, national and international levels.

Data collection methods and processes

The following section describes data collection methods and processes that relate to Project 1 which aimed at understanding current WIL practice and WIL staff capacity development needs (including RPL) in the TVET sector. The data collection methods were in line with the research design of the Research Chair which is characteristic of both quantitative and qualitative approaches.

Designing research instruments with TVET Colleges and related stakeholders

To ensure that there was a collaborative discussion process for designing, and revising research instruments, a workshop was organised to discuss the questions with representatives of the six TVET colleges in the Western Cape, the Western Cape Education Department (WCED), the South African College Principal's Organisation (SACPO), the ETDP SETA and CPUT staff at a workshop held at Granger Bay on 12 October 2015. The TVET College staff participated actively in revising, adapting, and adding questions. The involvement of the TVET staff in refining the research questions was an attempt to ensure relevance and applicability of the research questions to the TVET context and to clarify that the research journey was collaborative, co-owned and beneficial to all those involved.

Data collection and analysis

The questionnaire which was revised and developed further was set up on Survey Monkey and distributed to more than 1000 TVET staff in all the provinces of South Africa as an on-line questionnaire. The questions for the focus group interviews were piloted at a DHET-TVET WIL forum meeting held on Thursday, 17 March 2016 in the Western Cape. The responses to the questionnaire were followed with 18 focus group interviews (i.e. 2 focus group interviews in two colleges per province). The collected data was analysed quantitatively and qualitatively.

Research findings and enabling factors for the research chair

Research findings

The following research findings only relate to data that was collected by means of a survey. The focus group interviews are still in an analysis stage. The research findings that are presented below only relate to an understanding of WIL and RPL staff capacity development needs.

Education and training needs of WIL practitioners

Respondents were asked to identify their needs as a WIL practitioner in terms of education and training. Overall respondents highlighted that they wished to gain additional skills and training relevant to their areas of specialisation. Needs were also largely centred around keeping up to date with changes in industry. For example, respondents noted the following:

> *The techniques and information development changes often. We need to be able to keep up with new ideas and information development.*
>
> *Is to understand the changes of the industry compared to what the students are studying in schools currently.*

Specifically, the need to know about changes with regards to technology was emphasised:

> *I need to integrate latest industry technology into our syllabus.*
>
> *Gain more exposure to the industrial sector in order to keep up with new technology at industry.*
>
> *To be capacitated and equipped in different industries technologies and processes.*
>
> *More exposure to work places and technological training to align myself with modern technology.*
>
> *Being placed in the workplace to be exposed to the most current technological developments.*

Staff also noted the need to have training to allow them to become better teachers in their subject areas:

WIL will help me become a better educator, it is useless to teach our students the curriculum without the knowledge of what the industry need from them. With WIL I am able to integrate my teaching with the work place.

Staff need to be exposed to the industry so that they can relate this knowledge to the syllabus.

Understanding the industry better and the ability to link knowledge gained in the industry with the classroom knowledge.

In particular, 12 % of respondents also noted the need for more practical exposure to learning content, and work experience for both teachers and students so that they are able to link theory with practical experience, for example:

Place students to expose them to business environment before they finish their studies as to realise the importance of ethics and code of conduct etc in the workplace and also to see the bigger picture as a whole while studying. Combination of Theory and Practical.

To give me an inside of the connection between what is taught in business studies with what is happening in the real business out there.

Exposure to practical application of subjects in business and industry.

Practical exposure in water treatment L2, beer industry L4, electronics L4.

Practical work for marketing, for example, design a product, or promotional strategy.

To do the practical job to see if the theory can be practiced.

I need hands on learning in industry in order to transfer that in my classroom.

A further 7 % of respondents highlighted the need for management skills, specifically in project management, coordination, financial management, negotiation and facilitation, for example:

How to approach Companies

Making presentations, networking, how to do Service Level Agreement with employers. SSACI (Swiss South African Cooperation Initiative) has already helped us with the basics like how to recruit students, prepare them for WIL, prepare employers, etc.

How to comply with companies that place our students for training in their industries.

Additionally, 3 % of respondents indicated the need for training around how to implement WIL, for example:

How to link up with the different workplaces to ensure that WIL takes place as it should.

Two respondents noted the need for training in teaching methodology (to improve their teaching skills), and 4 % highlighted a need for training in their area of speciality, for example,

I need training in my field of specialist Economics.

As an electrical engineering lecturer I need the following: PLC (Programmable Logic Controller) training, Oscilloscope training, DC (direct current) machines training, Single-phase motors, etc.

Specialised baking courses to refresh.

Latest trends in Mathematics with specific emphasis on how to catch up basic skills which students do not know from the primary grades (e.g. fractions).

Another important training area identified was in regard to developing assessment skills, with nine respondents highlighting this need:

To assess the learner on both the formative as well as the summative assessment, by monitoring and evaluating the student at all times, to determine the progress and the relativeness of the job and the field of study.

Assess the learner, both formatively and summative against all unit standards as relevant to this Work Readiness Programme.

Training in Monitoring and Evaluation.

Assessor and moderator training.

Further, 3 % of respondents specifically noted that the WIL placements need to be directly relevant to what they need to learn:

Placement RELEVANT to improving my skills as a Mathematics lecturer. To observe bookkeeping or SARS or a bank really will not make me a better lecturer. I teach Engineering students. If an Engineer at a large company could show me the application of mathematics in the industry that would be useful, but we get no guidance or assistance on relevant placement.

Lecturer's should be send for courses that are relevant for their needs, or their shortcomings they might have.

Only 10 % of respondents were able to highlighted specific education areas they wanted to improve, for example:

Getting a teachers qualification (PGCE).

I want to further my studies in the Education field for Masters in Education.

Diploma in ODETP.

Preferably a qualification that is in line with either business or engineering studies and strong administration and communication skills.

Certificate in Business to business marketing, Human Resource Certificate, Project Management Skill.

Of these 10 %, a quarter highlighted the specific need for project management skills.

Acknowledging Recognition of Prior learning (RPL)

RPL presence and implementation at colleges

Respondents were asked whether RPL was implemented at their colleges. Only 18 % of respondents indicated that RPL is implemented at their college. However, there were disparities noted within colleges, where some respondents indicated that RPL was implemented while others indicated that it wasn't. This may be attributed to lack of understanding or familiarity with RPL.

Previous experience relevant to RPL

Respondents were asked whether they have any experience and knowledge gained from informal learning that they think should be recognised (as part of RPL) towards their qualifications or promotion. Almost a third (31 %) noted that they do have previous experience that is relevant to RPL. When asked to explain their responses, some were able to substantiate their responses, noting the experience that should be recognised, for example:

I worked for more than 25 years in industry on the mines and at hospitals where I gained a lot of experience and I feel that knowledge helps me a lot in the classroom.

I have so much experience in agriculture and have acquired informal qualification.

Retail industry experience and banking experience especially in customer care management.

I have been working for 13 years in the Business world before teaching at the College.

I have a qualification in project management and it is not recognized in terms of my salary payment.

Enabling Factors for the Research Chair

Through its focus on WIL, RPL and development of new WIL-related qualifications for TVET staff, the Research Chair is well-placed to initiate discussions, stimulate debate, strengthen partnerships, and encourage communication and collective action with a variety of interest groups at regional, national and international levels. The processes for developing and implementing HEQSF aligned and WIL-related qualifications as well as RPL practices will involve a wide range of stakeholders that will have to communicate and take action collectively. Such stakeholders include industry, government, SETAs, Quality Councils, TVET Colleges and universities.

In addition, the following factors provide an enabling environment for the Research Chair to create platforms for discussion forums:

Existing MoU between the South African Technology Network (SATN) and the South African College Principals Organisation (SACPO)

South African Universities of Technology have a well-coordinated network that signed an agreement with SACPO. Consequently, there are collaboration initiatives that are taking place between the TVET sector and the UoT sector. Such initiatives relate to articulation and joint programme offerings.

SATN National Committee on Programmes and Qualifications with its national WIL Task Team

SATN promotes communication and interaction through its national committees. One of its committees is the Programmes and Qualifications Committee that has a dedicated national task team for WIL. The task team is composed of WIL directors that liaise with all the Faculties and facilitate WIL at an institutional level).

Through the national WIL Task Team, it is possible for the Research Chair activities and research partnerships with TVET colleges to be discussed and implemented at national level.

The Department of Higher Education and Training (DHET) and SACPO support for the research

In its ethics approval letter, DHET expressed an interest in and support for the research. SACPO offered assistance for the Research Chair to get buy-in and support in the TVET sector and also expressed an interest in playing a monitoring and evaluation role. In addition, some of the TVET College Councils granted permission for the research to be conducted.

Feedback on presentations and discussion forums

The Research Chair activities were presented to the TVET Chamber and the Provisioning Chamber of the ETDP SETA on 7 and 14 March 2016 in Johannesburg. A presentation on the Research Chair activities was also done at the TVET- HE Research Colloquium which was organised by the ETDP SETA on 16–17 March 2016 in Johannesburg.

Summary

The Research Chair's aims of providing knowledge and insight into WIL practice and staff development needs in terms of RPL, curriculum design, WIL facilitation, WIL assessment, WIL partnership management and WIL research, are presented. Also presented are the research findings that relate to WIL and RPL staff capacity development needs in the TVET sector. Such identified needs have to be addressed through the development of a range of WIL related qualifications which are stipulated in the Higher Education Qualifications Sub Framework (HEQSF).

The development of WIL related qualifications requires robust partnerships between relevant stakeholders. It has been argued that an integrated approach that allows for greater participation of a wide variety of interest groups is key for the success of any intervention. Such participation encourages communication, constructive feedback and collective action that in turn ensure quality, effectiveness and efficiency. The Research Chair for WIL and RPL adopts this approach with the purpose of promoting effective and efficient WIL and RPL processes during its process of developing and implementing WIL related qualifications. It is against this background that the Research Chair calls for partnerships at regional, national and international levels.

The Research Chair also adopts an approach to research that encourages research for action with the aim of contributing to WIL staff development, development of necessary graduate attributes through WIL, graduate employability, development of WIL partnerships, socio-economic development and South Africa's economic

growth. This type of research is in line with the National Development Plan and therefore needs the support of a wide variety of interest groups.

An argument is put forward that for students to receive meaningful WIL and become employable citizens that contribute to their country's economic growth, they need qualified and competent staff that is able to facilitate and manage WIL effectively and efficiently. The planning and implementation of WIL is a complicated process and it should be understood that WIL involves curricular, pedagogical and assessment considerations that differ from those of general programmes. It is therefore necessary to develop WIL related qualifications that are of high quality and credible. Such credibility can only be guaranteed if all relevant stakeholders are included in the planning, implementation and evaluation processes.

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Teachers understanding of Entrepreneurship Education in Malawi Secondary Schools

Feggie M. Mphasi

Abstract

Education programmes in entrepreneurship are a new phenomenon in Malawi. The onset of the new Secondary School Curriculum Assessment Reform (SSCAR) has seen entrepreneurship topics introduced in technical subjects such as Agriculture, Metal Work, Wood Work and Technical Drawing. Despite introducing entrepreneurial concepts in the above subjects, the teachers of the subjects have not had prior training in entrepreneurship. Knowing that a successful education system is critically dependent on the quality of the teaching involved, research into teacher education therefore remains a priority. While teacher content knowledge is crucially important to the improvement of teaching and learning, attention to its development and study has been uneven in the Malawian setting and internationally. Debates have focused on how much preparation teachers need in the content strands rather than on what type of content they need to learn.

This study used focus group discussions and interviews with key persons. The focus of the study was to find out how the teaching of entrepreneurship concepts in technical subjects in Malawi secondary schools is affected by the teachers' entrepreneurial content knowledge and what should be done to improve entrepreneurial PCK. More especially, the paper has examined the entrepreneurial reasoning, insight, understanding, and skills required for a person to teach entrepreneurship.

Based on preliminary literature review and entrepreneurship report analysis, the article reveals lack of support and disorganisation of the process. The article concludes that the perplexity is as a result of lack of appropriate teaching pedagogy and support leading to poor governance. This article will help entrepreneurship education policy advocators to understand how best to implement entrepreneurship education by first training the implementers; teachers in this case.

Introduction

The Ministry of Education, Science and Technology (MoEST) in Malawi introduced a new Secondary School Curriculum Assessment Reform (SSCAR) which has incorporated entrepreneurship. The SSCAR has been implemented in the 2015−2016 academic year in all Malawian secondary schools. The SSCAR has included topics on entrepreneurship in all subjects. However, in order to attain the SSCAR objectives, teachers of entrepreneurship need to possess not only general pedagogical skills, but also content skills in entrepreneurship together called pedagogical content knowledge (PCK). Despite this, the training of the teachers to acquire entrepreneurship knowledge has not been emphasized. Pedagogical content knowledge (PCK) is one of the seven knowledge domains for teaching (L. Shulman, 1987). The study aimed at assessing the entrepreneurial reasoning, insight, understanding, and skills required for a person to teach entrepreneurship. Specifically, the study aimed to: (1) investigate technical education teachers' content knowledge of entrepreneurship, (2) find out teachers' views about entrepreneurship education, and (3) examine entrepreneurship teacher preparation.

Entrepreneurship education in Malawi schools

Entrepreneurship education includes all activities aiming to foster entrepreneurial mindsets, attitudes and skills and covering a range of aspects such as idea generation, start-up, growth and innovation (Arasti, Falavarjani, & Imanipour, 2012; Fayolle, Gailly, & Lassas-Clerc, 2006b). In an effort to improve the relevance of education in order to meet the needs of the students, potential employers and the nation and to strengthen the need to equip the youth with skills necessary for the survival regardless of attainment of tertiary education or not, the Malawi government has revised its secondary school curriculum to equip the youth with knowledge and life skills (Ministry of Economic Planning, 2002; Ministry of Education Science & Technology, 2002). In addition, the national goals of education, among other things, include the promotion of occupational and entrepreneurship skills, practical skills and ethical and socioeconomic skills (Ministry of Education Science & Technology, 2001). This can thus best be achieved through formal teaching and learning of entrepreneurship from the grassroots level. However, Ministry of Economic Planning (2002) observed that the provision of entrepreneurial schools cannot just happen overnight across Malawi owing to lack of qualified teachers to teach the subject and that this may in the long run defeat the whole purpose of the government's goal to take Malawi from the doldrums of poverty by the year 2020. Still more, despite this observation by Ministry of Economic Planning (2002), the SSCAR curriculum was still introduced before entrepreneurship teachers were trained. This has resulted in teachers without any or with little knowledge of entrepreneurship education teaching concepts of entrepreneurship in schools.

Currently, entrepreneurship has not been included as an independent subject, but rather as mere topics in different subjects. The topics are taught by teachers of

the specific subjects, the majority of whom do not know anything about entrepreneurship. This has resulted in lack of knowledge about the purpose for teaching entrepreneurship in secondary schools (Grossman, 1990; Magnusson, Krajcik, & Borko, 1999). The "knowledge of purpose of teaching the subject matter" indicates the knowledge about the purposes for teaching a subject in horizontal and vertical views. The horizontal view refers to the general principle of teaching a particular subject, whereas the vertical view refers to the goal of teaching a subject at a particular level. This knowledge is regarded as the most important PCK component (Grossman, 1990; Magnusson et al., 1999) because it guides teaching reasoning and instructional decisions. This knowledge guides teachers to reconstruct subject matter knowledge and to represent the subject matter knowledge in a comprehensible way. It filters the subject matter knowledge of teachers through teaching reasoning, which distinguishes teachers from content experts. Besides the holistic understandings of subject matter knowledge, teachers should also understand and decide what to teach and how to teach.

Consequently, the lack of the right people to teach entrepreneurship has led to disorganisation of the teaching of the concepts as well as poor governance of the same in Malawi.

Concept of PCK

According to Shulman, PCK is a special combination of content and pedagogy that is uniquely constructed by teachers. It represents the blending of content and pedagogy into an understanding of how particular topics, problems, and issues are organised, represented, and adapted to the diverse interests and abilities of learners. Cochran, King, and DeRuiter (1991) agrees with L. Shulman (1987) saying that PCK is the transformation of subject matter knowledge and general pedagogical knowledge. Kuratko (2005) however, argued that PCK is a separate category fuelled by subject matter as well as pedagogical and educational context knowledge. PCK can thus be said to be a concept that combines the knowledge of the content, for instance entrepreneurship, and metalwork; to the knowledge of the pedagogy, for instance, how to teach entrepreneurship or how to teach metalwork, giving insights into educational matters relative to the learning and teaching of a topic.

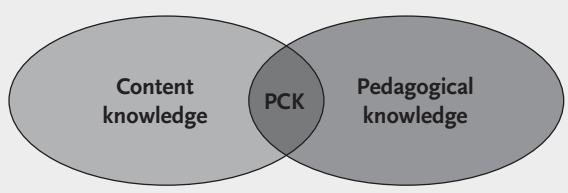

Fig. 1 Pedagogical content knowledge (adapted from Mueller et.al, 2014)

Despite the lack of consensus, researchers agree that the unique qualities of PCK are important in understanding teaching and education. This therefore means that

the lack of knowledge in entrepreneurship by teachers of technical and Vocational Education (TVE) subjects in Malawi is bound to bring a lot of challenges to them as teachers and to the attainment of the whole goal of introducing entrepreneurship in secondary schools. It should be noted that entrepreneurship education was mostly introduced in secondary schools to help learners develop a high entrepreneurial self-efficacy that will help them to venture into establishing own trades using skills attained in TVE subjects. Bae, Qian, Miao, and Fiet (2014) pointed out that entrepreneurial self-efficacy can only occur if the teaching of entrepreneurship is done in the same manner like the other subjects such as mathematics; where only those who are trained as mathematics teachers are supposed to teach mathematics.

Against this background, the paper is looking at the nature and extent of the pedagogical content knowledge among Malawian secondary school TVE teachers as they are required to teach entrepreneurship concepts for the first time. The discussion will be based on a modified model based on ideas of Shulman (1986; 1987) regarding pedagogical content knowledge. Shulman first introduced the PCK concept into the educational realm after he had noticed that policies that dealt with teacher competency in the 1980s ignored content and focussed largely on basic pedagogy. He also realised that there was a gap in research regarding subject matter content and that research literature on subject matter content teaching was lacking. The missing content became a matter of serious concern such that after a study on knowledge growth in teaching, they focused on content knowledge.

Methodology

The study used a qualitative paradigm where, focus group discussions (FDGs) and interviews with key persons were used to ensure validity and reliability of the findings. Altogether, three FGDs and two interviews were conducted. In addition, records indicating submission of lesson plans were also checked with the school authorities.

Discussion of the Findings

Technical education teachers' content knowledge of entrepreneurship

The study found that most teachers were lacking in entrepreneurship content knowledge as indicated from the responses in the FDGs. For example one teacher said that:

> "I have never learnt anything called entrepreneurship before, the only time I ever heard of it is when I saw the topic in the book"

Another one had this to say:

> "I thought entrepreneurship is business? So I just tell the learners to start businesses"

Such sentiments from teachers of the subject show that learners are not taught the concepts of entrepreneurship as spelt out in the various curricula. This therefore indicates that teachers fail to understand and transform subject matter knowledge for teaching purposes (Shulman, 1986). The transformation of subject matter knowledge involves a series of actions from the "preparation" of materials, "representation" of the ideas in various forms, "instructional selections" of teaching methods to "adapting" and "tailoring" instruction to specific learners and context (Shulman, 1987, p. 16). Furthermore, an effective teacher needs to master the subject matter knowledge of the subject that he or she teach, as well as the pedagogical knowledge related to the subject (Sipon, Pihie, Rahman, & Manaf, 2015). One key interviewee blamed the lack of knowledge on the hasty way entrepreneurship was introduced in the secondary school curriculum which led to teachers not being trained in the concept of entrepreneurship. However according to government records (Ministry of Economic Planning, 2002; Ministry of Education Science & Technology, 2002), there was ample time to allow for training of teachers from the time the idea was first hatched to the time entrepreneurship concepts were implemented in the syllabus. This shows a lack of support to teacher training by the government which has consequently led to lack of teachers' content knowledge of entrepreneurship, a vital component of PCK as asserted by Shulman (1986, 1987).

Teachers' views about entrepreneurship education and curriculum

Curricular knowledge represents the fundamental pedagogical feature of PCK (Magnusson et al., 1999) and relates teachers and students in school to the education goals. Knowledge of curriculum by teachers, mostly, indicates teaching objectives in school context are met, and also can help teachers, especially novice teachers, to develop their teaching style (Johns & Iredale, 2010). In the case of Malawi, most entrepreneurship teachers are novice teachers because almost all of them have never taught entrepreneurship before.

The study found that teachers have embraced entrepreneurship education in all VET subjects in secondary schools simply because they are supposed to ensure its implementation. However most of them do not know why it has been included in all subjects in secondary schools owing to their lack of knowledge of the Malawi curriculum despite every syllabus highlighting the curriculum at the beginning. All of the participants of the FDGs and the key persons interviewed were of the view.

Design of Current Technical and Vocational Education and Training (TVET) System in Zambia

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Abstract

The paper discusses the design of the current Technical and Vocational Education and Training (TVET) system in Zambia by considering the organisation, policy and legal frameworks and regulation of the sector. Also discussed is the national qualifications framework and the learning pathways are the institutional arrangements (ranging from Ministerial to Training institutions) and levels of training. The relationship between the Science, Technology and Innovation (STI) and TVET in Zambia is described. Challenges of TVET are also described. Recommendations are made on how to strengthen this relationship for the benefit of the TVET sector and citizens in the Southern African Development Community (SADC). These recommendations are made on STI and TVET sectors having regular interactions and exchange of information, SADC nations having greater networking and sharing of information, key stakeholders in the TVET sector interacting much closely and regularly.

Keywords

Technical and Vocational Education and Training; Science, Technology and Innovation; Southern African Development Community.

Country context

Zambia is a land-linked country with eight neighbouring states. The estimate population is: 14.5 million with 10 provinces and 100 districts. There are 73 tribes with 7 local languages used on electronic media and taught in schools. The official language is English. The economy comprises a mixed economy consisting of a modern urban sector and a largely rural agricultural sector.

Current TVET system

The Government of Zambia, through the Ministry of Higher Education has been working on reforming its system of technical education, vocational and entrepreneurship training (TEVET). This has been done through Policy Review, enactment of new legislation and adoption of strategies to implement the TEVET Policy. In 1996, the Government issued a policy document, i.e. Technical Education, Vocational and Entrepreneurship Training (TEVET) Policy. This policy underwent some review in 2008 and is still undergoing some review. The review is being undertaken in order to address changes in the socio-economic set-up of the nation.

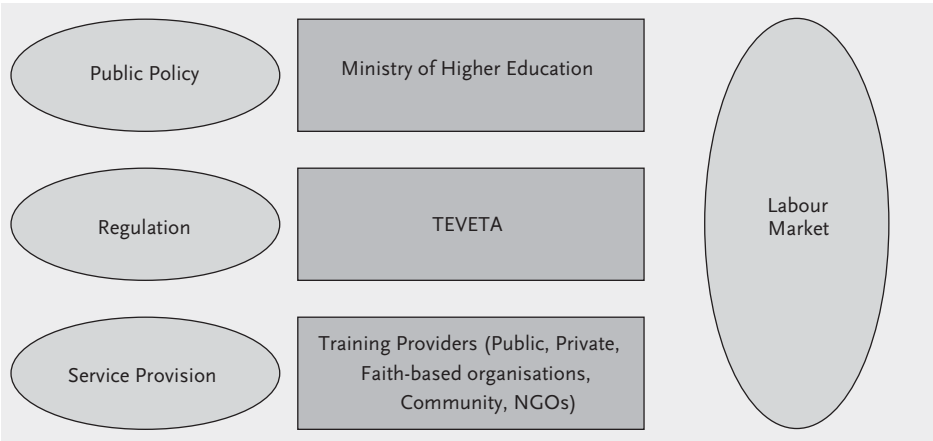

Fig. 1 Functional Structures of the TVET system in Zambia

Regulation of TEVET

The TEVET Act also led to the creation of the Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA). TEVETA's function is to regulate and monitor Technical and Vocational Education and Training (TVET) in Zambia. TEVETA does this through inspections carried out by part-time inspectors in all the provinces and through full-time staff based at its' headquarters in Lusaka. TEVETA is also responsible for the development and review of national curricula. It facilitates the development of local curricula for training institutions. The TEVET Act of 1998 has since been reviewed with the TEVET Act No. 11 of 2005 having since been enacted.

Department of Vocational Education and Training

In 2000, the Department of Technical Education and Vocational Training (DTEVT) was dissolved. In its place TEVETA was established. With the dissolution of DTVET, the 23 institutions which it managed, were placed under management boards. The Department of Vocational Education and Training (DVET) in the Ministry of Science, Technology and Vocational Training was created to formulate,

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monitor and evaluate the TEVET Policy. The department also promotes TEVET and also assesses the impact of TEVET programmes. Another function of the department is to increase stakeholder participation in the provision of TEVET. Before the current TVET reforms that started in the nineties, TVET provision was mostly done by public institutions. Currently TVET provision is done by private institutions, faith based organisations, trusts and community based institutions. The department has two units: Entrepreneurship and Skills units.

Entrepreneurship and Informal Sector Training

The TEVET Act led to the creation of entrepreneurship and informal sector training. This was meant to address the shrinking formal sector. Many African nations have experienced shrinking formal sectors. This has been due to embracing economic reforms. These reforms have been characterised by privatisation of parastatals, reduction of the formal sector through retrenchments. The shrinking formal sector has led to the growth of the informal economy (Konayuma, 2006:3).

Organisation of TVET

The TVET sector is organised into three major parts: policy making, regulation and training provision.

- The Ministry of Higher Education (MoHE) through DVET is responsible for TVET policy making and monitoring of the sector.
- TEVETA is responsible for regulation of the TVET sector.
- Registered training institutions offer training. Public institutions are under TVET sector ministries such as General Education, Community and Social Development, Higher Education, Tourism, Environment and Natural Resources. These ministries in addition to Labour and Social Security and Commerce and Industry belong to a TVET Inter-Ministerial Committee which discusses issues of common interest and concern in TVET. Apart from the Committee, the Chief Executive Officers of these ministries are supposed to meet at least twice a year.

The table below shows the distribution of training institutions by province:

Tab. 1 Distribution of Training Institutions – 2014

Province	*Number of institutions*	*Percentage of training institutions*
Central	14	5 %
Copperbelt	76	26 %
Eastern	12	4 %
Luapula	11	4 %
Lusaka	110	38 %
Muchinga	5	2 %
Northern	5	2 %
North – Western	12	4 %
Southern	35	12 %
Western	8	3 %
TOTAL	288	100 %

Source: TEVETA (2014).

Levels of Training

Training in TVET sector in Zambia is offered at the following levels:

- Trade Test
- Craft
- Technician
- Technologist/Diploma.

Entry requirements into these levels differs. Trainees come from primary, secondary and other training institutions. The general education system which feeds into the TVET system follows a 7–5 system. Primary education is 7 years and secondary education is 5 years. Secondary education has two years of Junior Secondary School and three years of high school. Tertiary education ranges from 1–7 years. The TVET sector enrolls about 35,124 learners (2015) in 300 institutions. A two-tier system has been introduced where students in selected secondary schools in grade 10 do both academic and vocational subjects. This is to enable such students fit into a vocational career path and be self-employed after secondary school. The TVET training levels are part of the Zambia National Qualifications Framework as shown in this diagram:

ZQF Level	Schooling	Technical and Vocational Education and Training	Higher Education
10			Doctorate Degree
9			Masters Degree
8			Post-Graduate Diploma
7			Bachelors Degree
6		Diploma	
5		Advanced Certificate (Technician)	
4		Certificate (Craft)	
3		Trade Test Certificate	
2	High School (Grade 12 Certificate)		
1	Basis Education (Grade 9 Certificate)		
Quality Assurance Body (Appropriate Authority)	Ministry of Education	TEVETA	Higher Education Authority (To be established)
Co-ordinating Body	**THE ZAMBIA QUALIFICATIONS AUTHORITY (ZQA)**		

Fig. 2 The Zambia National Qualifications Framework (Source: UNESCO, 2016)

Learning pathways

TEVET is currently based on six learning pathways i.e.

1. Institutional Based Traditional Face-to-face training
2. Secondary School Vocational System (Two-tier system)
3. Learnership System
4. Work-based Training System
5. Open and Distance Learning (Flexible and Blended Learning)
6. Recognition of Prior Learning (Assessment Only)

In-service training for teachers and other staff in vocational training

TEVETA requires that all lecturers in vocational colleges undergo pedagogical training apart from their professional qualification. Lecturers or trainers without pedagogical training undergo pedagogical training mainly at the Technical and Vocational Teachers' College in Luanshya. This training is normally short-intensive training that takes places during vacations or long term training that extends from 1 to 3 years. In-service training is also done for staff to improve their professional skills. This training is done locally or internationally and is supported by funding

from colleges, the Government, co-operating partners and international organisations. The training ranges from full-time, distance learning and online learning. Challenges of in-service training are that the numbers of trainers requiring training in various skills is larger than can be trained at any given time.

Issues and concerns of the Zambian TEVET system

The main issues and concerns of the Zambian TEVET system are quality, access and equity.

Quality

TEVTA carries out inspections in order to ensure that training offered in institutions meets its minimum standards of training. Some institutions do not register with TEVETA and thus offer unsuspecting trainees poor quality training. MSTVT through TEVETA is making every effort to ensure that the quality of training offered to trainees is of high quality and produces trainees that are of good quality. In 2008, more than 100 institutions were de-registered due to not meeting the minimum standards of training. Training institutions often face the challenge of offering quality training vis-à-vis quantity training. There is need to strike a proper balance. Institutions need to have relevant curricula that satisfies the needs of the trainees and industry.

Consultative meetings among key stakeholders are used to improve the quality of training. Signing of performance contracts and disbursement of funds (TEVET Fund) to support training also play a big role in improving quality training. Relevant curricula that satisfies the demands of industry also helps in enhancing quality. Learning outcomes of TVET curricula is supposed to match occupational profiles in industry. Curriculum design in TVET in Zambia is done using a mix of TVET trainers, staff from industry, professional associations and staff from Technical Education, Vocational and Entrepreneurship Training Authority (TEVETA) and government ministries. The curriculum is designed for various programmes ranging from Construction, Tailoring and Design, Information and Communication Technology, Carpentry and Joinery, Hospitality and Tourism etc. New programmes are developed when a training need is identified by training institutions, communities or industry. Existing programmes are reviewed in a similar manner.

Currently, TEVETA manages the curriculum design and review process by supervising the curriculum development teams and providing guidance. The curriculum is developed by developing occupational profiles for various skills levels of training. These are then used to develop curricula indicating the learning outcomes expected of trainees after the end of each learning programme (Konayuma, 2007: 4). Consultative meetings, inspections, articles in the media are some of the ways being used to improve training quality. MoHE organises consultative fora with TVET stakeholders every year. During the Stakeholders Consultative Forum,

the Minister reports on activities that the ministry has undertaken in the previous year. The Forum is also a planning meeting for the coming year. Resolutions are made on activities that various Stakeholders will undertake in the coming year.

Access

Ensuring that various types of persons access the TVET system is a big challenge. Efforts to address this challenge are being addressed by encouraging various stakeholders to be involved in training provision and encouraging distance learning. Distance learning however is only provided by 2 % of registered institutions. The ministry, TEVETA and TVTC (a leading provider of distance learning among TVET providers in Zambia) have planned various strategies to promote the introduction of distance learning by other TVET providers. Recognition of Prior Learning is also seen as another way of increasing access to those that could have previously disadvantaged into entering TVET institutions. In 2007, Zambia hosted a Commonwealth Association of Polytechnics in Africa Conference where best practices in Recognition of Prior Learning were shared. The conference also shared steps that some African nations had made in establishing qualifications frameworks in their nations. Further collaboration is required to ensure that nations can benchmark their practice against best practices within the Continent and outside. Then African nations will "ensure that the learning needs of all young people and adults are met through equitable access to appropriate learning and life-skills programmes" (UNESCO, 2005: 1).

Equity

The government and some training providers have introduced bursary schemes in order to address the issue of equity. Policies for gender, disability and HIV & AIDS have been developed and are being implemented. In a joint study that Botswana and Zambia did in 2006 it was noted that some TVET institutions had made significant progress in implementing effective HIV & AIDS programmes.

Linkages

The Ministry of Science, Technology & Vocational Training has noted the importance of strengthening linkages between TVET and Science & Technology. This is because both sectors are inter-dependant and complement each other.

Other issues are:

- Learner dropouts due to unethical work behaviour by some learners.
- Some training institutions expect to reap great financial benefits from employers that they have signed agreements with;
- Employers having a predefined learning material and learning instruction when there is a curricula that already exists in Zambia;
- Shifting goal posts when the training/learning programme has already commenced.

Reflection

The modes of training that have been outlined help to enhance the quality of the learning environment since learners have access to modern training equipment and facilities. Therefore, the learners have greater familiarity with the work environment in a chosen career and these training methods provide a way of networking between training providers and industry.

Future Plans

a) Legal Framework-Revision of the Apprenticeship Act to specify the roles which the key players will perform. In the interim, a framework and guidelines on implementing the Apprenticeship programme will be developed.

b) A National Skills Gap Survey is being undertaken by the Ministry of Labour together with stakeholders which will inform us of the missing skills that contribute towards socio-economic development of the country. The outcome from the survey will form part of the indicators for curriculum review and development by TEVETA.

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Competency based education and training for training of trainers in Vocational Education in Namibia: A curriculum evaluation

Lance P. Hauuanga

Abstract

An education programme is closely related to the economy and society and vocational education is achieving great prominence in Namibia. Namibia's Vision 2030's goal to become an industrialised and knowledge-based economy has emphasised the need to strengthen Vocational Education and Training (VET) and to align it to serve the current and emerging needs (ETSIP, 2006).

I became aware of the increasing number of people who are acknowledging that qualified VET trainers are needed in the country to reform and develop Vocational Education and Training (Formal debate on the Implementation of CBET in Namibia: 2010). The quality of vocational education greatly depends on the quality of its training force within the various institutions. In April 2016, the Namibian government has introduced an action plan the " Harambee Prosperity Plan(HPP)" towards improving the quality of the training staff and to increase the number of qualified VET trainers from 15,000 in 2015 to 25,000 by 2020 (HPP, 2016:45). Research has shown that there is mounting interest worldwide in the potential of developing qualifications for Vocational trainers that support attempts to improve trainer quality, enhance the relevance and industry acceptance of recognised training and bolster skill development within the broader economy.

The rationale to prioritise and invest in VET is strong and convincing and stems from the recognition of VET as a source of skills, knowledge and technology needed to drive productivity in knowledge-based and transitional societies for the twenty-first century (HPP, 2016:44). A higher quality of Vocational Education and Training is necessary in any country in order to supply a high quality labour force. In Namibia, the quality of vocational education will greatly depend on the quality of its training. "Developed economies were not built by PhD holders, but by craftsmen

and artisans. We cannot expect development without these requisite skills" (HHP, 2016:44). It is evident from the afore-mentioned statement that the role of qualified trainers will play a vital role in every society because they produce artisans and craftsman needed to develop and enhances the country's economy.

Summary

Historically, the Government of Namibia, through a financing agreement with the European Commission for the Namibia Human Resource Development Programme (NHRDP), designed and established Vocational Instructor training programmes at the then Polytechnic of Namibia (PoN) in 1998. The initiative was launched in 2001 and the Instructor Training Programmes (ITP) have been offered at the institution since then. The training programmes that were accredited by the Namibia Qualification Authority (NQA) as academic qualifications aimed at the development of pedagogical skills of individuals pursuing a career as an instructor in VET in Namibia. The targets for these qualifications are pre-service and in-service vocational instructors. The qualifications were developed to cater for instructors operating in a Competency Based Education and Training (CBET) system.

To provide these training programmes, a Department of Technical and Vocational Education and Training (DTVET) in the Faculty of Engineering was established in the then Polytechnic of Namibia. This department was established to develop structures and processes and create professional development opportunities to ensure the optimum alignment of the NTA requirements to the broad industry needs.

In early 2008, the Programme Management Unit for the establishment of the Namibia Training Authority (NTA) and the Ministry of Education (MoE), appointed foreign consultants to review the ITP that was offered by the then Polytechnic of Namibia (PoN) and it was intended that this review would be future orientated and focus on the relevancy of the course content, the structure and duration of the programme, the delivery methods, course assessment and the target groups of the programme.

Based on the review of the ITP, it was agreed with the recommendations from the consultants to replace the ITP with Unit Standard Qualifications for VET trainers that are consistent with the policies and procedures of the Namibia Qualification Authority (NQA) and articulate with the relevant Technical and Higher Education qualifications under the Namibia Qualification Framework (NQF). With these recommendations as point of departure, DTVET commenced with the curriculum process to develop a set of Unit Standards (USs) provided by the NTA and to present it to the major stake holders in VET at the end of April 2009.

The following training programmes based on USs were developed and registered on the Namibia Qualification Framework (NQF):

- Certificate in Vocational Education and Training: Trainer NQF Level 4

- Higher Certificate in Vocational Education and Training: Trainer NQF Level 5
- Diploma in Vocational Education and Training Management: NQF Level 6

The three training programmes are offered full-time, part-time and in distance education modes. The Certificate and Higher Certificate programmes can be completed in one academic year, whereas the Diploma can be completed in two years. The training programmes employ a CBET model for the course delivery.

This paper evaluated the existing curricula designed to encompass CBET for the training of trainers within the context of VET in Namibia. Results derived from this paper could promote curriculum reform and implementation thereof.

Empirical results

- There are currently 154 trainers in the Public VTCs and 58 trainers in the Private VTCs.
- 88 graduates from the Certificate programme (NQF Level 4)
- 62 graduates from the Higher Certificate programme (NQF Level 5)
- 48 graduates from the Diploma programme (NQF Level 6)

Tab. 1 Comparison of CBET to traditional training programmes
The table below highlights the major difference between the two types of programmes

Process	*CBET(2009 – current)*	*Traditional Training Programmes (2001–2008)*
Vocational standards (Major Content)	*Needs of employment (performance based)*	*Educational requirements, procedure and regulations*
Assessment	*Can do/Can't yet do (Competent/ Not yet competent*	*Grading scales, pass, fail*
Certification	*Modular/Unit Std. accreditation*	*Diploma*
Length of training programme	*Flexible – depends on needs*	*Fixed period*
Syllabus/curriculum model	*Modular/Unit Std.*	*Courses-whole programmes within defined occupations*
Delivery of training	*Multiple methods and locations*	*Institution based*
Methods of training	*Active, learner centered, project based*	*Traditional, lectures, show/tell, demonstration*

This table focussed on the evaluation of the Higher Education curricula pertaining to the CBET and Traditional qualifications for the training of trainers in VET which included trainers that were trained thus far. Five of the eight themes of Higher Education research as identified by Tight (2012), is covered in the paper, which include: teaching and learning; course design (curricula); the student experience-especially after graduation; quality; and institutional management.

Tab. 2 Comparisons of VET Qualifications between South Africa and Scotland
The table below shows the difference between the South Africa and Scotland qualifications.

Country	*South Africa*	*Scotland*
Responsible body	*Education, Training and Development Practice (ETDP) – SETA*	*The National Training Organisation for Employment (Ento) & LLUK*
Functions of Qualifications	*National recognised for Vocational trainers*	*National recognised for Vocational trainers*
Unit Standards	*108*	*41*
Number of Qualifications	*6*	*6*
Assessors	*SAQA, ETDP and SETA*	*SQA requirements*
Qualifications	*1. Further Education and Training Cert. L4* *2. National Certificate L5* *3. National Diploma* *4. National Cert. L6* *5. Bachelor L6*	*6. Level 3 in Learning and Development* *7. Level 3 in Direct Training and Support* *8. Level 4 Management of Learning* *9. Level 4 in Co-Ordination* *10. Level 5 in Learning and Development*

Literature indicates that research on Technical and Vocational Education and Training (TVET) is a relatively young field within the domain of educational research. It was only in the second half of the twentieth century that State institutes for TVET research were founded to investigate the foundations for the development of national TVET systems and to support planning bodies in shaping and organizing Vocational Education and Training (Rauner, 2009:1443). The researcher agreed to that the studies in Vocational Education and Training be conducted in all the types of institutions of vocational education, which includes Further Education, the qualification of vocational teachers, as well as national structures and systems and international comparative studies.

Conclusion

This paper attempted to evaluate the CBET and Traditional training programmes for VET trainers in Namibia and to provide a conceptual understanding of the implementation of the qualifications. In this context, CBET is broadly defined as training that develops the skills, knowledge and attributes required to achieve competency standards. NTA (2015). Given the assumed confusion that existed after the implementation of the CBET system, there is now a tremendous need for research and generation of knowledge to improve our understanding of the effect and influence that CBET has for VET practitioners in Namibia.

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Professionalization of VET teachers and Curriculum Development in VET System: Results of Survey, Practice and Challenges in Burkina Faso, Senegal and Germany

Wendkouni J. Eric Sawadogo

Abstract

VET systems in African countries do not match the qualifications and competences required in the labour market (UEMOA, 2004; Sawadogo, 2005, 2012). Instead they are more theoretical focusing on the shrinking formal sector that offers very limited employment opportunities. Consequently, this leads to high unemployment of their graduates.

Due to lack of alternative employment in the formal sector, a critical mass of these graduates is obliged to find occupations in the "informal sector". However they haven't been equipped with the requisite skills.

A paradigm shift to the so-called "informal sector" must be done, so that local education and employment possibilities could be better taken into account in the policies of VET system, especially in the process of professionalization of teachers (Sawadogo, 2012).

In this process, the development of curricula for teachers and skilled workers becomes a key factor.

Indeed, "the competence of skilled workers, i.e. their professionalism, in the "informal sector" esp. consists in the successful completion of professional work and business processes *and* their ability to secure fair financial remuneration for their services" (ibid. p. 87).

In light of this, this paper shows how contextualized concepts and an Internship Reports-Based Method of Updating or Developing Curricula (ibid. p. 178ff) could contribute to Further Education of VET teachers.

Based on the above-mentioned concepts, the paper draws from Burkina Faso, Germany and Senegal examples of Further Education for VET teachers that would guide the establishment of a FE system.

Keywords

Professionalization, competences, informal sector, paradigm shift, curriculum updating, internship reports based method, VET teacher training and further training

Professionalization of VET teachers and Curriculum Development in VET system: Results of Survey, Practice and Challenges in Burkina Faso, Senegal and Germany

Introduction

Although VET education alone does not guarantee employment, it is certainly an indispensable factor in the expansion and development of employment, because productivity, earnings and better conditions of life increase, through amongst other things, capacity building and innovation.

Although VET systems in countries of Sub Sahara Africa cost at least three times more than basic secondary education systems, they often provide no better foundation for private sector jobs (IBRD, 2014, EUR 20).

They are generally more theoretical and focused on a shrinking formal sector, which offers very limited employment opportunities. Consequently, unemployment is highest among their graduates due to a lack of competitiveness in the labour market (UEMOA, 2004; Sawadogo, 2005, 2012).

The majority of VET teachers has no work or practical experiences in the specific teaching subject area and it has no good (regular and formal) connection to the enterprises related to their field in the labour market. This majority never or rarely goes on excursions with their pupils and it seldom or never makes use of internships (Sawadogo, 2005, 2011).

The professionalization of multipliers and the quality of the curricula are key factors to develop and secure the quality of VET and FE systems, so that VET graduates can transfer successfully their acquired knowledge from the training field to the field of application, i. e. in the labour market.

The Problem of Transfer of acquired Knowledge from Training Field to Field of Application (Labour Market)

The challenges in VET system are e.g., how professionalization of VET teachers and curriculum development can be designed and implemented, so that graduates, who are or will be in paid employment or who take or will take themselves (self-employment) entrepreneurial activities on the market, will be empowered to secure and improve their activities.

Teachers in vocational training, similar to their counterparts in the general education, mediate systematically the contents of their learning programmes (curricula) in the given time, such that their learners (trainees, students) are able to pass the final exams with good results. That unfortunately does not mean that

- the graduates are sufficiently educated and
- trained according to the required knowledge and skills in the labour market, so that
- they can apply the content they have learned in the work conditions (function field).

These failures represent the problem of inert knowledge by creating insufficient link between theoretical knowledge and processes acquired in VET education and workplace contexts and practices in the labour market.

These problems can be attributed to the deficiency and inadequacy of the learning content and processes (curriculum), of pedagogical equipment and in the transfer of knowledge from the training field to workplace.

According to psychological instruction studies, the production of inert knowledge is in the way, how knowledge in the sense of application relatedness, life orientation, and practical orientation is so mediated (Sawadogo, 2012; Gruber, Mandl & Renkl, 2000; Gerstenmaier & Mandl, 1995).

Thus, professional teaching and learning processes should be, more than ever, related to the social and economic development of the country, to the learning and work context.

VET education should prepare students for employment, for lifelong learning and in general for the life in the society.

The examples below (Figure 2 and Figure 3) take into account these aspects from the guidance, the requirements check, the recruitment, the phase of specific competence development until the phase of preparation and supporting the entering in the labour market.

The professionalization of VET Teachers

The goal of professionalization is to enable an individual to realize effective and efficient work actions and typical tasks in accordance with certain standards. Professionalism (professionality) refers to a particular quality of professional actions by skilled workers.

Tietgens (1988) defines professionalism as the ability to use broad, scientifically deepened and diverse abstract knowledge adequate in concrete situations.

Typical tasks for trainers in the Further Education and training are:

1. Preparation of teaching units and the review after giving the lessons (e. g. selection of content and justification of this selection, organization and evaluation).

2. Implementation of teaching units (e.g. didactic-methodological design of instruction).
3. Educational guidance (e.g. guidance of person or institution).
4. Development of concepts (e.g. strategic planning, development, organization and evaluation of a project).
5. Project management (e.g. project application, acquisition, organization and evaluation of a project).
6. Human resource development (e.g. recruiting staff, staffing, capacity building, of staff).
7. Networking (e.g. securing, strengthening and development of cooperation with partners).
8. (Educational) controlling (e.g. planning, management and control of the educational institution).
9. Public relations (e.g. information, communication and marketing work) (Sawadogo, 2011, p. 86).

The professionalization of VET teachers should orient the teaching and learning processes to the professional actions and activities, which are embedded or anchored in most authentic contexts (e.g. the informal sector).

In this way, all the acquired knowledge, skills and abilities could better be connected with knowledge elements, which are relevant both for the practice and the required actions (Sawadogo, 2012).

The professionalization of VET teachers can contribute to an effective development of the required competences in trainees and learners if the curricula match the needs or competences required in the labour market.

Otherwise the professionalization of VET teachers alone will not be sufficient to provide the skills needed by workers.

This calls for continuous development of the VET teacher's competences as well as for continuous actualization of curricula not only for the formal sector but also *for* and *in* the so called informal sector.

VET Curriculum Development and the Labour market ("informal sector")

To promote the quality of their human capital, Burkina Faso and Senegal, like other African countries, have initiated curriculum reform in 1996 through competency-based approach (Approche Par Compétences (APC)).

The results present points of satisfaction, such as the integration of this approach in the training of VET teachers, the production of pedagogical documents, the gradual appropriation of the APC approach by the actors and some proved improvement of the quality of teaching. However, other issues relating e. g. to working conditions and professional capacity of teachers, as to the monitoring and the accompaniment of the reform remain (DGIFPE/MESS, 2012; MJFPE, 2012; AFD, 2010).

In practice, it appears that the used theoretical concepts of the approach as the processes of development and implementation of curricula in this reform, are different depending on the international partner or donor country and on the technical operator (AFD, 2010; IBE-UNESCO, 2008; Tankoano, 2012). Due to lack of sufficient funds and personnel for the curriculum reform, the development and the implementation of curricula for some subject areas couldn't be completed as intended. Through this situation the reform could not properly achieve their goals.

Survey results show that the organization, development and updating of VET curriculum are deficient. It lacks for example, evidence for initiating the updating of training occupations (Sawadogo, 2012).

In addition to this, both countries have implemented curriculum projects for non-formal Vocational Education and Training in some relevant occupational areas in the "informal sector" in order to connect non-formal to formal education and training in the VET systems (MJFPE, 2012; Sawadogo, 2010; Tankoano, 2012). These non-formal education initiatives were based on existing Traditional Vocational Training, which is widespread in West Africa: The Sahelian apprenticeship in Burkina Faso, which is based on family relationships and the Coastal apprenticeship in Senegal, which is based on commercial relationship.

With the results of these projects, the equivalence between formal technical qualifications and non-formal professional qualifications is now established, e. g. in 2015 by a decree in Burkina Faso. These non-formal education initiatives were successful in Burkina Faso and in Senegal and they represent hope for change (X. Roegiers, 2012; Tankoano, 2012).

Africa's economy is characterized by high levels of self-employment. The greatest part of this employment takes place at the "informal sector", which employs about 80 % of city workers in African cities (IBRD/WB, 2014).

To promote the employment in Sub-Sahara Africa, the perception and appreciation of this sector, which is generally described with the negative term coined "informal sector", must be changed. Demand-led curricula for formal as non-formal initial and Further Education and training in combination with other active labor market policies (APESS, 2012) have to be developed and implemented. As Mungazi (1997) puts it, change in education is necessary to initiate change in society.

The relevant employment- as education-related aspects of the so called informal sector must be taken in consideration in the personal and organizational development actions and measures at all levels: macro-, meso- and micro-levels (situation regarding traditional occupations, cooperation, counseling, curriculum development, adult education, permanent control of processes with required suitable structures and responsibilities).

This essential shift of paradigm lets us consider the "informal sector" in developing countries as something positive, legal, worthy to develop, to promote and as something which can be well developed and transformed into formal employment. This consideration must find its expression in the curricula through for

example contextualized and adapted contents, terms and concepts (e. g. competence) in VET/FE systems.

Concept of Competence in the African (biggest) Labour Market

The skilled work in the "informal sector" differs from the one in the formal sector, not only in terms of the working relationships and conditions but also in relation to the scope and the complexity of the job requirements, of needed skills and competences for success in work.

The "informal sector" workers do not enjoy the state labour protection, the state-controlled collective agreements like regulated mandatory services costs by the professional associations or the "comfort" and the "security" of a formal employment relationship. On the contrary, the competences of skilled workers, i.e. their professionalism, consists of a successful completion of professional work in business processes and their ability to secure for themselves fair remuneration for their services (Sawadogo, 2012).

Therefore VET plays a central role in developing the competences and skills of individuals. Thus, VET empowers individuals to undertake necessary and meaningful activities in the society thereby, enabling them simultaneously to secure and improve their livelihoods.

In the "informal sector", where workers often are their own employers, individual empowerment has to be regarded as a criteria of assessment (allocation) of these competences. In order to assess these competences, sufficient scientific methods and instruments are needed to guarantee the identification and analyses of work and business processes for the required competences.

The Internship Reports-Based Method for Updating VET Curricula in VET (Sawadogo, 2012, p. 178 ff.)

The use of the internship reports based method to update or develop curricula for the informal and formal sector focuses on establishing a more flexible and stronger communication between employers and education institutions and as well as fostering the professionalization of teaching and training in VET system. In this method, the quality of research methods and instruments used to measure the competences are crucial in fostering research in VET (see Figure 1).

The method is not only a flexible, systematic, cost-effective and manageable tool but also a system of internal mechanism for quality development.

Through research at the work place, informal knowledge, work experiences, wishes and suggestions of teachers and students as well as of enterprises and especially of professionals in the informal (traditional) and formal sector can be recorded, documented and evaluated for possible updating of the curriculum. The recorded data undergoes deep analysis, and synthesis in order to make evidence-based decisions.

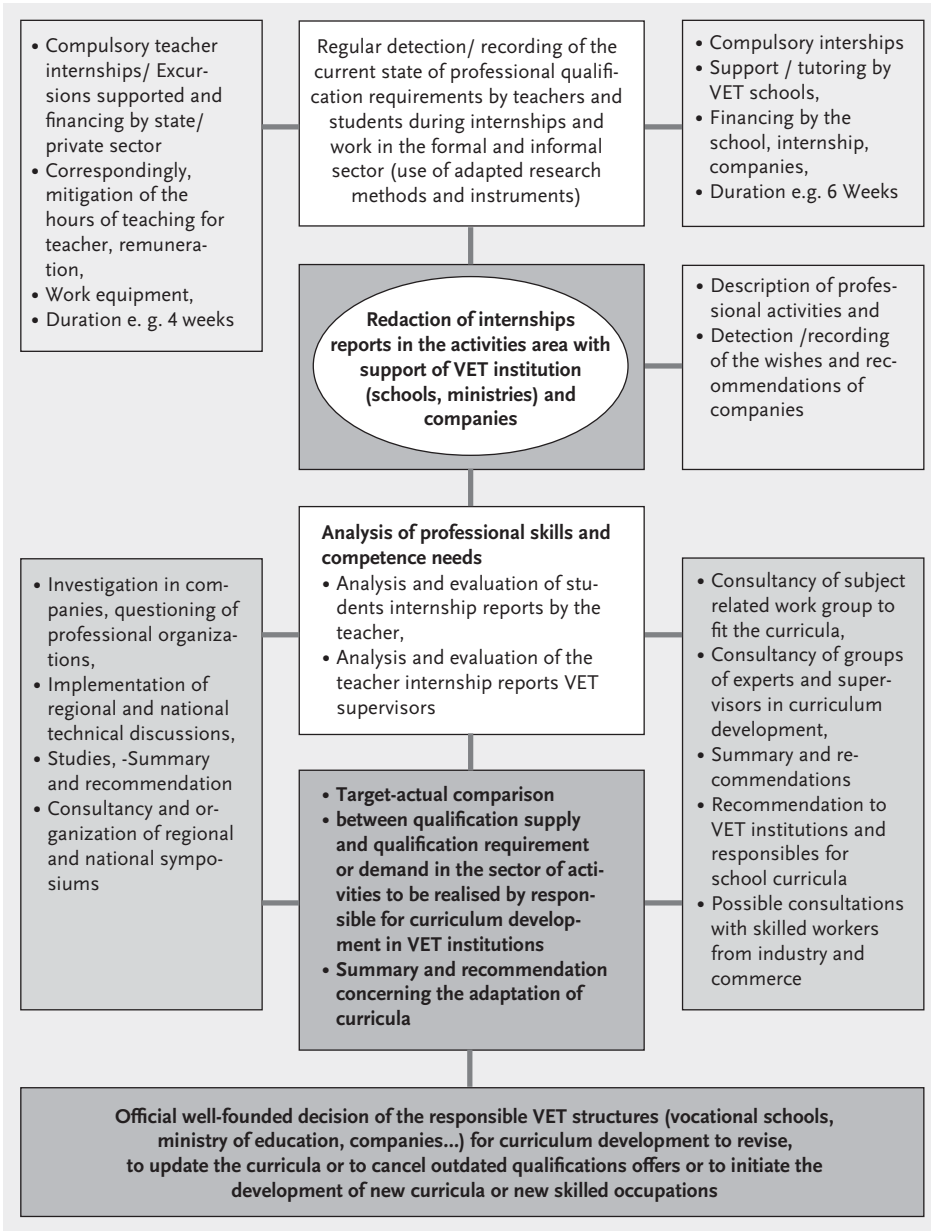

Fig. 1 "Internship reports-based method for updating or developing of curricula", (Sawadogo, 2012, p. 180)

Through this decision-making process, the basis for action, the legitimacy, the occupational competence and capacity of VET trainers and managers responsible for curriculum development are strengthened and increased.

This method is alive to the fact that curriculum development itself is always under construction, hence should provide an updating process of the curricula within

five steps all through the school year/academic term. This curriculum development method is both process-oriented and short-term-oriented. The updating of curricula has therefore to be seen as a process, which accompanies tasks in VET/FES and in labour market. Nonetheless, the method guarantees low costs, is less bureaucratic and closer to professional learning and work situations. As such, it must be systematically initiated, planned, implemented and evaluated (Sawadogo, 2012).

Challenges in Professionalization of VET Teachers and Curriculum Development

In the projects mentioned below, initial and further training programmes have been initiated and implemented in order to develop the professionalization of VET teachers in Burkina Faso, Senegal and indirectly in Germany (Figure 2 and Figure 3).

- Project: "Solar Technician and Curriculum" (Hartmann, M. D., 2014; Sawadogo, W. J. E., 2014): The participant could develop e. g. their capacities by designing a curriculum related to the labour market and improve their knowledges and competences in the field of renewable energy. The designed curriculum was validated, vocational Schools were equipped with technical and pedagogic material. The implementation of the curriculum started at October 2015.
- Master programme (MTFP*): (Hartmann, M. D., 2015; Sawadogo, W. J. E., 2015): A joint application for funding this programme has been prepared and submitted to the DAAD. Participants developed e. g. their competences related to the VET teacher training, (curricula, international standards of quality and Management) and share experiences.
- JEFOSP**: Journées d'échanges sur l'éducation, la formation, l'orientation/insertion scolaire et professionnelle (Sawadogo, 2013): Participants developed e. g. their competences related to education and employment and share experiences.

In these Figures, an attempt was made to put, for example, more attention on the contexts, goals, contents, situations of learning and work, prerequisites of target group, didactic-methodological design, methods of adult education in order to correspond to the needs of competences.

Examples	Project: Solar Technician (Senegal & Germany)	Master programme MTFP* (Burkina Faso / Germany)	JEFOSP** (Burkina Faso / Germany)
Goals under emphasis on contexts and situations of learning and work as target group, adult education, ...	• Continuous training of VET teacher • Development of curriculum • Promotion of the Renewable Energy • Preparation / support in entering the labour market • Vocational skills development related (relation to work and business process, professional knowledge) ...	• Continuing training on curriculum development, • Initial training for VET teacher, research in VET • Vocational skills development (related to work and business process, professional knowledge) ...	• Continuing training, Promotion of the cooperation between VET institutions, labour market • Promotion of the counselling ...
Content of the training; e.g.	• Planning and installation of solar and photovoltaic facilities by way of practical experience • Basics of curriculum development phase, methods of curriculum development • Learning content from the fields of electrical engineering, economy, sociology and VET • Development of curriculum in close coordination between all involved parties and according to technical standards and based of the social and economic situation in Senegal • Various excursions to institutions and companies around in Senegal, Hesse, in Dresden and through Germany completed the course programme ... (Start of the implementation: 10.2014)	• Basics of curriculum development phase, methods of curriculum development • The development of the curriculum • Development of curriculum in close coordination between all involved parties and according to technical standards and based of the social and economic situation in Senegal	• Given general topics • Open and free choice topics
Didactic-methodological design	• Workshops, seminars, practice, excursions, • E-learning	Workshops	Workshops

Fig. 2 Examples of Further Education (FE) and curriculum development for VET Multipliers in Burkina Faso, Senegal and in Germany

*: MTFP: Master programme "Master en enseignement techniques et formation professionnelle (MTFP)" in Burkina Faso

**: JEFOSP: Journées d'échanges sur l'éducation, la formation, l'orientation/ insertion scolaire et professionnelle

Aims/ Elements of the curriculum	Check the entry requirements, advisory, consulting and selection of participants	Development of vocational skills related to work and business processes, professional knowledge, technical / economic / socio-cultural analyses of systems	Preparation / support in entering the labor market
Introduction Presentation of the curriculum	• Module 1 (2 weeks): Welcome, introduction; structure and objectives of the training programme, review of conditions resp. of prerequisites / admission to measure		
Modules of level I 3 weeks spent per module	• Module 2: simple DC system with battery (domestic installation / maintenance) Component selection, workflow planning, contract design • Module 3: Power systems (municipal city/countryside) socioeconomic study, procurement, dimensioning, DC-AC • Module 4: Installation / Use a commercial plant (quality, sizing, costing, implementation, security, warranty, maintenance)		Module 7 (2 Weeks spent) accompanied internship
Modules of level II 4 weeks spent per modules	• Module 5: Installation of hybrid systems, such as hospitals (socioeconomic study, dimensioning, e.g. generators, coupling through automation, system backup) • Module 6: Following the general grid (among other requirements operators at the installations legal regulations, technology of supply, Smart Grid)		
Recommendations on the use / certification	• Organization of the training program's process; final examination (2 weeks)		

Source: Sawadogo, W. J. E. and Hartmann, M. D. (2013), Structure of the curriculum "Solateur Photovoltaique", TUD.

Fig. 3 Structure of the curriculum, Solar Technician for VET Teacher in Senegal (Sawadogo, 2013; M. D. Hartmann, 2013)

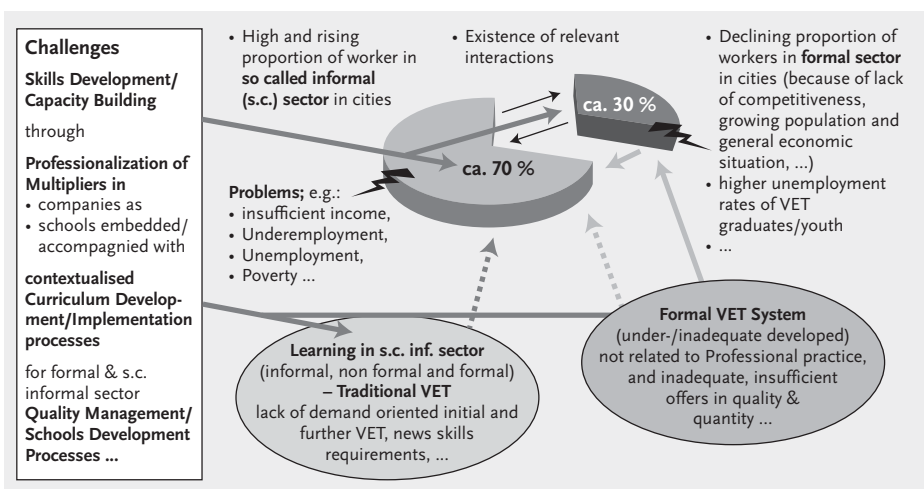

Fig. 4 Labour market, Employment and initial and further Vocational Education and Training situation (VET/FE) as challenges in cities and countries in Sub-Sahara Africa (Sawadogo, 2013)

As shown in Figure 4, there are several challenges that hinder the professionalization of VET teacher and the curriculum development in VET/FES to contribute effectively, efficiently and impact-oriented to the achievement of these goals and sustain the assurance and development of quality in VET/FE system. In order to

achieve this target, effective quality management systems (e.g. QESplus, circle of quality, schools evaluation measures, competence of trainers, and projects) should be developed in the VET and teacher education institutions (Wiesner, 2009).

VII Conclusion

Professionalization of VET teachers (multipliers), continuous development and updating of curricula to be labour market oriented are key factors for the development of initial and further Vocational Education and Training. However, their high costs constitute major obstacles for many Sub-Sahara-African VET systems. In order to develop the internal and external quality assurance systems of VET and FE in Sub Sahara Africa, flexible, systematic, cost-effective and manageable process-oriented and short-term-oriented methods, instruments and tools have to be developed, implemented and evaluated. The integration of the so called informal sector in the VET policies must become an imperative to tackle globally the problems of employment and training for youth in Sub Sahara Africa.

The particular attention to the "informal sector" in training and employment policies calls for a paradigm change by international and local political actors (for example, actors in education, employment and economic sectors).

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Professionalization of VET teachers in Ethiopia: The current practices, the challenges and the way forward

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ABSTRACT

In the past, TVET teachers acquired pedagogical and vocational skills at the beginning of their career. This would be adequate for them to prepare TVET trainees for the job they were being prepared. However, today this is no longer possible as real "world of work" is changing and demanding new knowledge, innovative learning methods, advanced technology and work practices in a non-stopping way. One way of tackling the challenge is through professionalization of teachers so that they would be equipped with necessary skills and knowledge that enable them to cope up with the ubiquitous change. As a result, this paper initiated to identify the current practices and challenges Ethiopia is facing in the move towards professionalizing TVET teachers. This was done through critical review of national documents on TVET system where international literatures were also used for comparison. In addition, empirical data were collected from TVET colleges in Jimma town (Ethiopia) for illustration. In general, the study shows that due emphasis was given for professionalization of TVET teachers by clearly defining profiles for TVET teachers of different levels. However, there is high shortage of TVET teachers, particularly industry-based trainers. The shortage is due to lack of competent candidates who can meet the requirements. Lack of Higher Learning Institutions that can supply TVET teachers is the other factor. In addition, those who have gone through pedagogical training were also opting for teacher-dominated teaching approach, which is against the basic principle of TVET pedagogy.

Background of the study

Technical and Vocational Education and Training (TVET) is a kind of education that mainly focused on leading participants to develop the practical skills, the know-how, and understanding necessary for employment in particular occupation

or groups of occupation (World Bank, 2001). TVET system in Ethiopia is also meant for the same purpose. The Education and Training policy of the country stressed on the role of TVET in producing skilled human power that can contribute towards rapid economic development (MOE, 2002). The document added that TVET is presumed as a tool for the effective utilization of human resources which is the basic difference between developed and developing countries. To this end, TVET system required to be needs based and graduates have to be equipped with competences demanded by labor markets. Cognizant of this fact, Ethiopian TVET system was reorganized into outcome-based system with the direction set by the National TVET strategy issued in 2008 (MOE, 2008). Accordingly, competences requirement in the labor markets become benchmark for teaching, training, learning, assessment and qualification.

The main objective of TVET is to produce lower-level, middle-level competent and motivated, adaptable and innovative workforce that can contribute strongly to the country's economy development and poverty reduction (MOE, 2010; 2015). However, the mere production of technically competent TVET graduates doesn't guarantee having competent and productive labor force unless all rounded personality development of graduates is put at center of TVET system. Having professional TVET teachers is among the many factors influencing the production of competent, motivated, self-reliant, adaptable and innovative TVET graduates (MOE, 2008). This is so as teachers are linchpin in the act of transforming education (Hattie, 2012). Hence, it is naBve to think to achieve desirable educational changes without conscious and active participation of teachers. For this matter, Fullan (2007) named teachers as an agent of change as it is the teachers who will translate the desired reform into practice. He also noted that teachers themselves need to undergo change if they are required of implementing the change into their classroom teaching. Hence, he named teachers also as an object of change. This shows that teachers need to be equipped with the required knowledge, skills, and dispositions that can assist them to implement the desirable change in their teaching and thereby facilitate the learning of learners. This implies that all teachers including TVET teachers need to be professionalized in order to carry out successfully the tasks expected of them.

Professionalization of teachers begins at teacher education programme; hence teacher education programme is considered as a place where teachers start learning the profession of teaching (Darling-Hammond & Lieberman, 2012). In the past, once TVET teachers acquired pedagogical and vocational skills at the beginning of their career, it would be adequate for them to prepare TVET trainees for the job they are being prepared. However, today this is no longer possible as real world work is changing and demanding new knowledge, new learning methods, new technology and work practices in a non-stopping way. One way of tackling the challenge is through professionalization of teachers so that they would be equipped with necessary skills and knowledge that enable them to cope up with the ubiquitous change (Korthagen, 2004). Therefore, the initial and further training is needed for teachers and instructors in TVET system of all levels. As a result,

this paper initiated to identify the current practices and challenges Ethiopia is facing in the move towards professionalizing TVET teachers.

Objectives of the study

The article has three key objectives:

- to unfold the current practices towards professionalization of TVET teachers in Ethiopia,
- to reveal challenges in professionalizing TVET teachers,
- to suggest the way forwards.

Research methods

There are plenty of research methodologies being emerged in a continual base. However, the research questions intended to be answered determine methods, source of information, tools for data collection, analysis of data and presentation of the output as well. Having this in mind, the following methods were utilized in order to identify the current practices and challenges the country is facing in professionalizing TVET teachers:

- critical review of the following national documents with TVET in focus:
  - Growth and Transformational Plan I (2000−2015),
  - Growth and Transformational Plan II (2015/16−2020/21),
  - Education and Training Policy issued in 1994,
  - Evaluative studies conducted by Ethiopian Academy of Science (EAS, 2016),
  - Educational Sector Development Programme IV and V (ESDP IV &V);
- collection and analysis of empirical qualitative data[1] through interviews conducted with:
  - VET teachers and students,
  - Expert from the Zone Education Bureau responsible for TVET,
  - Oromia Regional State Commissioner for TVET.

The empirical data could substantiate the findings from critical review of ministerial documents.

The Context of the study

In the last two decades, Ethiopia has been embarked on improving access to formal education of all levels. In the current rapidly expanding education system, TVET programme is playing decisive roles in making most of workforce productive and competitive (MOE, 2016). Accordingly, the government has set a plan to admit 80 % of grade ten completers to TVET colleges while the remaining 20 %

1 For methodological issues see Tacconi, 2011.

to upper secondary education to prepare for university education (MOE, 2015). In order to absorb the majority of grade ten completers, construction and upgrading of TVET colleges have been taking place throughout the country. By the end of 2013/14, there was a plan to offer at least one TVET college for each Woreda (*district*). However, in reality there were woredas which couldn't get TVET College although there has been massive construction of such colleges (MOE, 2015). In general, there were 1,348 TVET institutions in 2013/14, which is even surpassed the plan for the year, which was 1,074 institutes. These TVET colleges absorbed 45 % of grade ten completers among which females ratio went up to 51 %. As mentioned in the document, the fact that families and grade ten graduates considered going for TVET College as a least alternative is accounted for the low number of students joined TVET colleges. They rather prefer to join Teacher Education Colleges for primary school teachers.

With all the above mentioned shortcomings, the number of TVET teachers and trainers keep on increasing from time to time. For example, the number of trainers increased from 11.153 in 2011/12 to 17.322 in 2013/14 (MOE, 2015). There are five levels of TVET Education: Level I, II, III, IV and V. (MOE, 2008). For each of these levels different categories of teachers are required. Hence, there are three categories of VET teachers, namely, A-level, B-level and C-level teachers. Level I, II and III students are expected to be taught by at least C-Level teachers. C-level teachers has graduated from a TVET institute above level three, has been assessed as competent to train at that level and has undertaken C-level training methodology. Level-IV students are taught at least by B-level trainers who are expected to have bachelor degree and assessed as competent to train at level four and have undertaken B-level training methodology. Lastly but not least, Level-V students are expected to be taught by A-Level trainers. A-level trainers have Master's degree and have been assessed as competent to train at level five and has undertaken A-level methodology. Therefore, the above indicated figure of TVET teachers maintained the planned distribution of trainers of 1:3:24 ratio for A:B:C level trainers (MOE, 2015). However, even if the planned ratio was achieved over the last five years, still there is high scarcity for B-level trainers. In addition, females were meagerly represented both as a trainers (17 %) and leaders (3 % out of the total of 2.604) (MOE, 2015).

The other issue which deserves further clarification before proceeding to the main theme is the concept of TVET teacher. Who are TVET teachers? To this end, we need to consider the training modality being used by TVET system. The TVET system used cooperative training modality whereby students are expected to spend 30 % of their time in TVET institutes to develop theoretical concepts and basic skills while 70 % in industry to acquire bulk and depth of practical skills in the work place (MOE, 2016). According to the source indicated above, in the last five years, 83 % of TVET trainees deployed to industry for apprenticeship. This tells us that there are two types of TVET trainers: Institution based TVET trainers and Industry based TVET trainers.

Professionalization of TVET teachers

Teaching profession plays a crucial role in equipping citizens with necessary knowledge, skills and dispositions that they need to develop their potential and to become active member of the society and the workforce (European Commission, 2010). As it is already mentioned teacher education is the first stage where teachers start learning formally about teaching profession. Therefore, in order to improve quality of teaching profession, it is vital to consider the issue from its root that leads towards improvement of teacher education. Improving quality of teacher education meant that the pass card to teach is only provided for those who have the interest, the ability, and the attitude to teach. Having this in mind, the Government of Ethiopia clearly set a direction for provision of TVET teacher/instructor training in its education and training policy issued in 1994 and in the National TVET strategy of 2008 (TGE, 1994; MOE, 2008). As to the policy document, teachers of any level of education including TVET need to be certified before stepping in the classroom. This means that teaching TVET students needs special training or practical skills that involve high level of education that someone else doesn't demonstrate without undergoing training like any type of profession.

There are specific features that make a profession a profession. In the first case, the members need to have distinctive *profile*. Second, there should be a sieve that filters new members to join the profession so that anybody merely out of passion will not be allowed to do so *(recruitment of members*). Accordingly, those who show up interest in the profession must also go through intensive learning of the content knowledge. Thirdly, in the case of teaching profession including that of TVET, there must be pre-service training that prepares people to join the profession for the first time. Finally, as discipline knowledge and required competences are in a constant move (dynamic), there should be also a window whereby the members keep on updating their knowledge and skills against the drastic change in real world of work (*in-service training*). Put it differently, there are four factors which appear to influence the status of a given profession: professional profile of members, recruitment mechanisms, opportunities for pre-service and in-service training. Therefore, the attempt of professionalization of TVET teachers in Ethiopia will be analyzed from the perspectives of the above four factors.

Profile of TVET teachers

The first and the most important thing is the profile required to be a TVET teacher. As clearly mentioned in the government document, no one is allowed to teach at TVET institutes only out of passion or for the sake of earning living (MOE, 2008). The following three parameters have been set and used in order to filter out competent and interested trainers:

A. Educational qualification – TVET teachers of the three levels required to fulfill educational qualification required for each level. C-level trainers at least have to graduate from TVET institute of three levels. Similarly, B-level trai-

ners are expected to have bachelor degree from a recognized higher learning institute. Finally, master's degree is required for A-level trainers;

B. ***Ethical and technical competence to teach (passing on occupational assessment)*** – Educational qualification is a prerequisite to join TVET system as a trainer. However, it is not sufficient to determine the competence of the individual to teach in TVET system. For this reason the second litmus test is the search for proof of ethical and technical competences of the applicant to teach. To this end, occupational assessment is prepared separately for each level and only applicants who perform well on the assessment can be considered for further assessment. As some of the interviewees mentioned senior staff, who had joined TVET colleges some years back only based on their educational qualification, were suspended from teaching position because they couldn't make pass on occupational assessment. To illustrate:

> ... there are senior staff who have joined our college before the commencement of COC *[occupational assessment]* exam. Now they took the exam and failed, hence they are suspended from teaching job. They are doing administrative activities now and at same time preparing themselves for the exam (*Teacher interviewee 2*);
>
> Now a day, COC is becoming a concern for teachers. If you couldn't make pass on the exam you can't get hired as a teacher. Some of my colleagues have failed because they couldn't perform well particularly the practical aspect. You must practice and understand the reason behind each practice. As a result, my friends who are preparing for exam are intensively reading and practicing all core practices (*Teacher Interviewee 3*).

The above two scenarios imply that technical competence to teach at a given level has been critically considered and as a result applicants have been also engaged seriously in the learning process;

C. ***Teaching methodology –*** once a candidate successfully demonstrates the criteria set like level of educational qualification and occupational assessment, he or she must go through training methodology designed for teaching of the specific level before resuming teaching position. However, TVET teachers interviewed reflected reservation on the effectiveness of the teaching methodology as a requirement for resuming teaching position compared with the rest of the criteria. Let's consider the following excerpt:

> ... you need to present certificate of participation in the training methodology, which is mostly organized either at Nekempte or Addis Ababa. Since only participation is needed and no serious practical as well as theoretical examination is designed for it unlike occupational assessment, trainees don't seriously attend the training... There is also no system that forces you to implement the training skills into classroom teaching. Because of this fact, some of teachers are continuing to teach in traditional way than at least trying to apply what has been learned during methodology training (*TVET teacher interviewee 1*).

As can be understood from the above excerpt, while *educational qualification* and assessment as *a competent to teach* at a given level are prerequisite to be hired as a TVET teacher, for *training methodology* only participation in the training is needed. This made teacher candidates not to take seriously pedagogy courses, which has its own implication on the application of innovative pedagogies in their later teaching. In sum, table 1 presents summary of profiles of TVET teachers:

Tab. 1 Summary of profile of TVET teachers

TVET level	Minimum trainer's profile	Description/requirements
Level I Level II Level III	C-level trainer	• Has graduated from a TVET institute above three level • Has been assessed as a competent to train at the levels • Has undertaken C-level training methodology
Level IV	B-level trainer	• Has bachelor degree • Assessed as competent to train at level four • Has undertaken B-level training methodology
Level V	A-level trainer	• Has master's degree • Has assessed as competent to train at level five • Has undertaken A-level training methodology

Having predefined profile for TVET teachers of different level is important in order to enhance the status of the profession. However, it is important to look into the current status of TVET colleges in satisfying themselves with teachers of the required profile. As the evaluation of the last five years educational sector development programme (2000/01−2014/15) shows, the trainers' distribution was not aligned with the need. Particularly, there exists a shortage of B-level institution based trainers and of industry based trainers of all levels. Qualitative data collected from respondents also implies the same message.

> There is scarcity of qualified teachers for level IV and above. For example, one of TVET College for soft skills in Jimma couldn't be promoted to level IV because of lack of qualified teachers. This is so since we couldn't get experts from a market...; you know that the problem is nationwide as there is insignificant number of higher learning Institutes that supply TVET teachers (*Zone TVET expert interviewee*);
>
> ... I am at level III and attending accounting. I liked the support we were provided with during level I and II. I appreciate my teachers. However, the situation now at level III is not similar to the previous levels. It is only one teacher who is teaching us. Students are not happy with him even during level I and II. Hence, we presented our compliant to the college in need of replacing him with another teacher. However, the college responded that it didn't have any alternative teacher to replace him. As a result, some of my friends have decided to make transfer to another town. Actually this is a must for me as well to move to another town if I could make pass on occupational assessment for level III since my college doesn't have level IV programme. ...We already asked the college dean to open Level IV but the response was the same, i.e., we don't have teachers (*TVET student interviewee 4*).

These all scenarios show that even if there is limitation of professional teachers, the Government as well as TVET colleges are not letting unqualified people to take over TVET classes. They also didn't consider the shortest path to profession, which is dangerous for the status of the profession as well as for the quality of teaching (Darling-Hammond, 2009).

Recruitment of teachers

As the system expands, ongoing recruitment of trainers will be required to match enrolment demands. So as to maintain the promise of having TVET teachers of the required profile with adequate number, pragmatic recruitment mechanism needs to be in place. This is also well thought and designed in the government document although still there is a gap in addressing the limitation of teachers for some levels of the training. The following are strategies set to recruit competent candidates to the profession:

- *recruiting from higher level TVET training completers* – C-level institutions trainers will be recruited from level four and above training completers who are ethically and technically competent and interested in completing the upgrading to become a trainer;
- *upgrading trainers to the next level* – trainers updating and upgrading have been also taking place to promote C-level to B-level and B-level to A-level as required to meet the training demands. The upgrading has been taking place in the TVET trainer Institutes established for the same purpose;
- *direct recruitment from market* – at the time the upgrading strategy fail to meet the demand for trainers, direct recruitment from the market takes place. This is mostly done for B-level and A-level trainers;
- *recruiting from industry* – industry based trainers who provide cooperative training and can also serve as assessors are expected to be recruited from industry. However, good progress is not yet observed in this regard as witnessed by the government documents and interviewees as well.

In sum, trainers are expected to be recruited from industry, directly from TVET colleges, higher level TVET completers, and higher learning institutions. Recruiting of trainers from TVET training institutes as well as upgrading of trainers helps to ensure that up-to date skills are retained within the training system.

Pre-service training

As long as we agreed that teaching at TVET institutes is one aspect of teaching profession, it is mandatory to have a pre-service teacher education programme where new entrants will start learning and practicing teaching. For this matter, the country has gone through different experiences in establishing strong pre-service TVET teachers. Following the issuance of National TVET strategy in 2008, TVET Trainers Training programme was established in public universities. It was first started in Adama University (the present Adama Science and Technology University), then expanded to other well established universities including Jimma University.

However, training of TVET teachers in the Universities didn't succeed and now vanished from all universities. One of the main key factors was the fact that the design as well as the delivery of the courses gave due emphasis for teaching of theory at the expense of practice. As a result, graduates failed to cope up with teaching of practical aspects at TVET colleges. The first author was also participating in the programme particularly facilitating pedagogies courses and witnessed that all University teachers teaching discipline content, pedagogies and subject area methodology used to teach in the way they were teaching other university students. On top of that candidates were also not interested to be TVET teachers; rather they were inclined towards engineering despite the degree nomenclature they were to obtain. These all added up and made graduates incompetent to take over teaching position at TVET colleges. The following extract was taken from interview with Commissioner for TVET in Oromia regional state to shorten the story and to get the point why the programme was cancelled from universities:

> ... my office as well as the National TVET agency had made an agreement with public universities to train TVET teachers. The training was started at Adama Science and Technology University first and then extended to other universities. However, since the training was more theoretical because of various reasons, the intent of producing qualified TVET teachers was not realized. I remember exactly what happened at Adama Science and Technology University who was the pioneer in starting the programme. The teaching and learning process became more of classroom based theory and less action based pedagogy was utilized. As a result, there was serious complain from students to the extent of boycotting classes. The problem was also seen in other universities ... The then graduates of TVET teachers now suspended from teaching position since they couldn't successfully pass on the occupational assessment designed for TVET teachers. As a result, now we cancelled all TVET teachers training programmes launched in collaboration with universities. Instead one TVET teachers training Institute is established nationally in Addis Ababa namely *Ethio-china Polytechnic college* to train teachers at A-level. Competent Teacher educators from international markets (Asia, Europe and the like) who successfully passed on qualification examination have been recruited and running the training programme ... The college is implementing action based pedagogy and both theory and practices are well-coordinated (*Oromia regional state commissioner for TVET*).

As can be understood from the above excerpt, now TVET colleges, Commission for TVET at regional bureau and National TVET agency are keeping themselves away from Universities. While A-level trainers are being prepared nationally by Ethio-China Polytechnic college, upgrading of C-level and B-level trainers take place at regional TVET trainer training institutes. Presently, each region has at least one of such training college. This shows that the linkage between universities and the surrounding TVET colleges are becoming weak. The task of universities becomes offering internship opportunities for trainees.

In-service training and certification

Besides organizing pre-service TVET teacher training, the Government has set clear direction for updating existing TVET teachers with required knowledge and skills through in-service training. For instance, the competences of all TVET trainers were assessed and training was provided on the identified gaps and occupational standards. As already mentioned, currently there are many teachers put off teaching job because they couldn't succeed on occupational assessment. These teachers need to go through in-service training and sit again for occupational assessment. In general, training provided on the following topics in the last five years: Entrepreneurship training, Occupational specific curriculum development, Training methodology, Institutional assessment, Quality and productivity improvement and Implementation of cooperative training modality (MOE, 2015). Moreover, the Government has already planned to provide in-service training on technology adaption for all TVET teachers on duty, which will definitely demand even more institutes that will provide the training (MOE, 2016).

Pedagogies being used in TVET colleges

The above section speaks for itself that the Government as well as TVET colleges have doing great job so as to professionalize TVET teachers. Predetermining the professional profile of TVET teachers for different levels, undergoing rigorous process in recruiting TVET teachers, organizing pre-service training for new teachers joining the profession and provision of in-service training opportunities have been given emphasis, which are believed to be relevant for teaching profession in general and that of TVET teachers in particular. However, the value of these all endeavors is measured by the extent to which TVET teachers applied relevant pedagogies in their teaching. To this end, evaluative studies, reflection of TVET teachers, trainees and experts have been solicited to get insight into the reality on the ground.

The recent evaluative study conducted by Ethiopian Academy of Science (ESA, 2016) reveals that 71 % of TVET trainees participating in the study responded that their TVET teachers have been using teacher-dominated approach to instruction. This is even high compared to university final year students of similar discipline where 64 % of them confirmed that their professors were using teacher-dominated talk and blackboard use at the expense of using other learning-centered teaching methods.

The other story is that interviews with TVET trainers and trainees portrayed similar impression with the evaluative study indicated above. To illustrate:

> ... I have been here for the last three years; ...all of them [TVET trainers] are lecturing. I never touched parts of automobile... neither in the college nor outside of the college. ...I think my friend is better than me in this regard as he has relative who has a garage and is working there at his spare time. ...even he is regularly earning money from it. ...He is our group leader... in one to five networking and all assignments have been done by him. Mostly what we need to do is to check if he has registered correctly our names and identification

number on the cover page. Now, I feel that this is not good. I and some of my colleagues are wasting our time. ....No feedback on assignments is given. The presentations are conducted by the team leader. ...the feedback is given only on written and practical examination that takes place during CoC exams (*TVET trainee 3*);

... the teaching methodology being used in the college is more of lecturing ... There is also problem of instructional materials. They are giving us to copy like this one (*showing the course syllabus for one of the module for Level I accounting*). As you can see from this you can't get adequate information from this material. ...Students who have money including me are attending also night class. ...we do so since we can't get succeed on CoC unless and otherwise we relearn the content with extension class...(*TVET trainee 4*).

The above interview excerpts disclose that TVET teachers were not only lecturing but they were also not systematically assessing the progress of trainees, give differentiated feedback, encourage interdependence as well as individual accountability in the process of learning (Gillies, 2003). For that matter, trainees were not getting adequate understanding let alone competence to perform something. In this regard, it is difficult to consider that appropriate pedagogies are being implemented in teaching trainees.

TVET teachers involved in the study have also confessed that they were not effectively facilitating learning to the degree they were expected of doing. They sorted out the hindering factors as well. For example:

... there are many factors influencing the teaching and learning process in the college. In the first case, students are not showing interest in practical activities, ... they looked at teachers who give them intensive practical activities as enemy. ... I can see also limitation in ability to learn ...Sorry to say that some of them are coming here simply to snatch certificate, not to develop competences and knowledge they were supposed to have (TVET teacher 2);

... I know that I am not doing what I am expected to do. This is because of lack of training materials. How can I teach practically maintenance of automobile on the condition that there is no automobile to be repaired ... I lecture, then demonstrate for example parts of a motor. It is up to them to search and practice. This is the only thing I can offer ... (TVET teacher 5).

Accordingly to the above interview excerpts, lack of interest from students in the practical activities as well as the fact that less prepared students joined TVET colleges made TVET teachers not to run the teaching and learning process in the way they wanted. Besides, lack of learning materials hampered the practical aspect of learning. What so ever the reasons are, the application of mere teaching-centered approaches will bring nothing in terms of learning of trainees. The critical issue worth rethinking is that if pedagogy is missed used at TVET colleges, how could the objectives of producing competent, motivated, adaptable and innovative work force be possible? As of the current situation and as witnessed by partici-

pants, trainees would rather develop helplessness, dependency and stubbornness except those who enter the system with purpose.

Conclusion

The article intended to uncover the current practices and challenges Ethiopia is facing in the move towards professionalizing TVET teachers. This was done through critical review of national documents and studies conducted on VET system. In addition, empirical data collected from trainees, teachers, experts and leaders relevant for TVET system were used to illustrate the reality on the ground. In general, the study shows that outstanding emphasis was given for professionalization of TVET teachers. The first indicator is having of clearly defined profile for TVET teachers of different levels. The second is using of rigorous procedure for filtering outstanding TVET teachers into the system. Thirdly, pre-service training is provided for new entrants into the system as teachers. In addition, in-service training is provided for teachers based on gap analysis and occupational standards and this has been done since 2010 (MOE, 2010). Thus, professional development has been provided on continual bases in response to the dynamic nature of the needs and labor market demands.

Nevertheless this doesn't mean that the country is able to afford TVET teachers both in quality and quantity as well as all necessary training materials are put in place. Even the analysis of previously conducted evaluative study and qualitative data collected for illustration demonstrate that TVET teachers were not utilizing relevant pedagogies in their teaching despite these all endeavors. In general, the following are challenges hampering the progress of the professionalization of TVET teachers as well as the effective implementation of teaching at TVET colleges and industries:

- lack of competent candidates for TVET trainers, particularly B-level trainers,
- high shortage of industry-based trainers,
- unavailability of universities and institutes that supply A-level and B-level trainers,
- students and community which lag behind in internalizing the value of TVET and its strategy,
- underemphasizing the role universities could have in professionalizing TVET teachers,
- weak relation between universities and TVET institutes (right now their relation limited to absorbing trainees for apprenticeship) and
- requiring certificate of participation in Training Methodology that going for competent performance.

So, what should be done in order to face the above mentioned challenges and enhance the professionalization of TVET teachers? The following two points are presented as the way forward:

- universities need to work cooperatively with National TVET agency, Regional TVET commission, and TVET colleges to solve the prevailing problems as

well as meeting the five year national plan regarding professionalization of TVET teachers;
- like educational qualification and technical competence to teach at a given level, competence in applying training methodology should also be considered as mandatory.

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Closing remarks

The discussion held at the end of the Symposium is presented in the following as a summary and/or a conclusion to the Procedia. The final discussion revealed that the participants were extremely interested in establishing and sustaining the collaboration, which appears to be crucial for the development of Vocational Education and Training (VET) as well as for the Further Education of the VET teachers. It was emphasised that all participants attribute enormous importance to Further Education; furthermore, the reasons for creating combined multilevel training and education programmes should be set forth as soon as possible.

Ralph Dreher from the University of Siegen moderated the final discussion with panel guests. The panel was composed of Benadeth N. Ezekoye from Michael Okpara University of Agriculture, Umudike, Abia in Nigeria, Ewnetu H. Tamene from the University of Jimma in Ethiopia, Piet Lem from Fontys University of Applied Sciences in The Netherlands and Zhao Zhiqun from Beijing Normal University in China. The audience was also encouraged to participate in the discussion.

The discussion revealed that the development of the VET systems affects all participants, regardless of how their different Vocational Education systems work today. "We share a vision and are backed up by colleagues in our work for better VET-programmes," Piet Lem from The Netherlands said.

The discussions, the examples given and the statements showed that adopting the concepts of Vocational Education from Europe, the Anglo-American or the Asian education market is not the solution.

Moreover, it is not productive to aim for a common African solution. Each African country has its own experience, ideas, possibilities and political agenda, resulting in specific financial resources, administrative structures and pre-developed education frameworks. Zhao Zhiqun from China observed that "The regions must create individual strategies for VET."

It was clear to all participants that networking is important and necessary for cooperation and mutual support. To date, there has not been "much interaction, not much learning from each other amongst African countries," Gabriel Konayuma from Zambia stated. Therefore, Benadeth N. Ezekoye from Nigeria argued, "We need an effective collaboration of VET institutions, universities and industries within Sub-Saharan African countries. Such cooperation should be extended to European countries and particularly Germany because of the long, productive and rich experiences it has in working in regions."

The participants agreed that VET plays an important role in the economic and social development of the countries and therefore needs acceptance in the respective societies. Piet Lem clarified that "VET needs its status to be appreciated by the people as an important element within the school system." Zhao Zhiqun stated, "There is a problem in the value of VET." This problem requires a solution. The discussion participants agreed that VET must earn the respect of the people. Different proposals were put forward for achieving this. "TVET teachers must become agents of change and must create solutions for youth unemployment and poverty. They have to develop the research into real solutions for the communities in Africa," Mary Madileng from South Africa said.

One central idea was that Vocational Education must meet the requirements of education (not just training) and the economy.

However, this calls for a change in global thinking. Almost every country is searching for practical solutions. "The USA is already rebranding the concept of VET and experimenting with a different concept called Career & Technical Education (CTE)," said Benjamin Ogwo from the United States. Moses Oketch from Great Britain added, "A new concept must be developed, based on competences and knowledge, not on skills."

The symposium helped to exchange new ideas. "We learned how to learn from each other and cooperate better amongst African countries," Gabriel Konayuma from Zambia said.

Adula B. Hunde from Ethiopia acknowledged the necessity of creating collaboration among VET colleges, universities and industries by saying "The first step for work-oriented teaching and learning is to establish and strengthen collaboration among universities, VET colleges and industries."

Networking is an approach to improving the connection of theory and practice in Vocational Education. According to Benadeth N. Ezekoye, it is to ask "how we can link VET institutions and industry." All participating countries are in the same boat in this regard: "This is a problem that has to be faced by all participating countries: the dual approach is not only a challenge for Africa but for the whole world, where there are not enough industries and where the industry and school linkage is weak," said Ewnetu Tamene.

"Work-process knowledge is needed in a work-oriented concept," according to Zhao Zhiqun. He added that the concept of work needs defining; it needs a wide understanding of work, industry needs and the needs of students. The question remained of how to realise this – a challenge for many developing countries. "We all agree that there must be experience in industry and there must be experience in schools," stated Ewnetu H. Tamene. "These experiences must be brought together, that might fill the missing link. But, in our context, we cannot find industries all over the region in Ethiopia. 80 % of the students come from rural areas and have no link to industry. But trainers need to be trained in real work." Experience from other countries could provide a solution. In this respect, the exchange at the symposium is vital.

A new work-oriented concept calls for new teachers and trainers. The audience pointed out that most VET teachers were trained at colleges: Africa has no qualified VET teachers for this concept. Adula B. Hunde added, "In Ethiopia, training for trainers started a few

years ago. We must upgrade people from lower levels to become trainers. The people from lower levels are less prepared for school."

Therefore, the Further Education of teachers and trainers is an urgent issue. The question is which Further education method leads to which results. Waldemar Bauer remarked that Germany has standards that regulate the competence of VET teachers or trainers. Nevertheless, these standards are only valid for Germany; the African countries have to define their own criteria.

Zhao Zhiqun mentioned international standards. "The UNESCO developed a framework for the education of VET teachers for a master's degree 12 years ago." This could be regarded as a foundation. Zhao Zhiqun stated clearly that "Innovation is a must for VET. Therefore, it is important to have master's degree VET teachers in developing countries." Piet Lem asked "Bachelor or master teachers? That is fine for higher-level students but 50 % of the pupils in VET stay on a very low level. They need a different teacher, not per se a teacher with a high level of technical knowledge. These pupils need good, dedicated coaches to prevent them from dropping out. Do not forget the dropouts of the lower-level pupils with low life skills. They will never get to the job market again." Gesine Haseloff from Germany added, "Teachers are needed for all levels. Trainers in companies are needed as well as teachers with master degrees and PhDs at the schools. They could bridge the gap to research that is important for the development of VET."

It is important to offer teachers perspectives. "People must have an option to continue," said Mary Madileng. The establishment of non-academic training for teachers at universities comes up against significant barriers. "We tried to introduce a qualification ladder for VET in South Africa. But the university did not approve of it. They insist that a university degree is required for VET teachers," Ken Duncan from South Africa reported on his experience.

The question emerged of how to develop a multilevel training system. Can it be cross-national? Would it be a good idea to have a common framework?

Benadeth Ezekoye answered that "A common framework would be a good idea." Ewnetu Tamene added, "A framework should follow the economic demand and the need for lower level education. We need a framework which enables development from lower to medium and to higher level VET teachers." "The different levels are already present in China. The country has had good experiences with it." said Zhao Zhiqun.

"All questions concerning the Further Education of teachers have to take into account that the trainee is in the focus of the effort," the audience added. Ralph Dreher pointed out that "The content of education cannot only meet the requirements of industry – it is also important to interact in society and the economy. These are facts that have to be taken into consideration regarding the education of VET teachers. Therefore, teachers need pedagogical competence."

The symposium was not only concerned with a qualification framework. The competence to shape educational processes should be the aim of the Further Education of teachers in Vocational Education. "It is not only important to consider the qualification of a teacher but also the competences," Nicolas Schrode stated. "Further Education should be aiming at acquiring competences in order to realise the meaningful and practice-oriented learning of the trainee," Gesine Haseloff added; "we developed and presented a concept."

A modular educational training is an appropriate concept for VET. Non-academic experts are acceptable for the lower levels; however, for Vocational Education, we need teachers with an academic background. Qualification is crucial for teachers at all levels. A useful concept must be highly flexible, integrating pedagogic and scientific education. Networking with industry and society is indispensable.

Cooperation is imperative in supporting these processes and the training of teachers. The conference gave the green light for this cooperation.

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There is a rising demand for specialist workers in several countries of Sub-Saharan Africa (SSA). The area still lacks a consistent system of professional training and further education. The conference transcript comprises practical knowledge collected by the authors to depict the current state of professional training within the Sub-Saharan African countries.

The paper also introduces the reader to concepts for the development of a professional training system and provides an overview of the strategies and plans of different countries and institutions. The included articles were written within the framework of a symposium on the status quo and the perspective of professional training and further education. This gathering took place in Namibia in August 2016 and brought together researchers and business actors from the Sub-Saharan states, Europe, Australia, and Asia.

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