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UNEVOC

International Centre
for Technical and Vocational
Education and Training

Vocational pedagogy

What it is, why it matters and how to put it into practice

Report of the UNESCO-UNEVOC
virtual conference

12-26 May 2014

Moderated by Bill Lucas



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Foreword

The 2014 Education for All Global Monitoring Report on teaching and learning reminded us that there is a global learning crisis and that the quality of education is at the centre of it. The quality of education largely depends on good teachers. This is particularly evident in technical and vocational education and training, where TVET teachers have a distinctive role to play in improving the quality of education. Quality TVET teachers are those with both expert knowledge in their field and who have the ability to transfer this knowledge to their students. However, we too often forget to discuss this important question: how to teach TVET?

To further our understanding of vocational pedagogy, UNESCO-UNEVOC organized a virtual conference from 12 to 26 May 2014 on the UNEVOC e-Forum. Moderated by Professor Bill Lucas, Director of the Centre for Real-World Learning, Professor of Learning at the University of Winchester (United Kingdom) and co-creator of the Expansive Education Network, this virtual conference explored what vocational pedagogy is, why it matters and how teachers can put it into practice.

The two-week virtual conference attracted 197 participants from 65 different countries, representing policy makers, researchers, practitioners and most importantly, teachers and students. They came together to deepen their understanding of vocational pedagogy and comprehend its complexity. The contributions and experiences shared illustrated the importance of vocational pedagogy in improving learner outcomes in TVET, as well its role as a catalyst for raising the status and quality of TVET.

This virtual conference was the ninth in a series of moderator-driven discussions introduced by UNESCO-UNEVOC in 2011. Held on the UNEVOC e-Forum – a global online community of over 3,500 members – and guided by an expert in the field, these discussions provide a platform for sharing of experiences, expertise and feedback and wish to inspire people to take further action.

We would like to thank Professor Bill Lucas for sharing his expertise on vocational pedagogy with the wider TVET community and for drafting this synthesis report, which we hope will be useful in the work of TVET teachers and other TVET stakeholders. We furthermore extend our sincere gratitude to all participants who took their precious time to share their experiences on the topic and contributed to the development of this report.

Shyamal Majumdar
Head of UNESCO-UNEVOC International Centre

Introduction



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Around the world technical and vocational education and training (TVET) is widely seen as having a key role in promoting both economic and socio-economic growth, increasing productivity, empowering citizens and alleviating poverty. Yet the quality of TVET in terms of learner outcomes and teaching inputs is variable. In some countries this unhelpful inconsistency is being addressed through the use of accountability regimes to validate the quality of provision, in others through increased professionalization and training of the TVET workforce. Other methods of improving TVET include investment in buildings and equipment, better engagement of employers in the process of curriculum development, the use of smart technologies and the development of formative assessment practices.

But if we are really to improve TVET in all of its many forms then we need to understand the teaching and learning methods which

make it work best. In short we need to have a robust model of vocational pedagogy – the science, art and craft of teaching and learning vocational education. We need to be able to describe with clarity and confidence the teaching and learning methods that are most effective for a range of different learners seeking to acquire skills, competences and dispositions in many different contexts.

Yet research has shown that vocational pedagogy is under-researched and under-theorized, despite some notable exceptions. Too often research focuses on the system level – the kinds of competences needed for the twenty-first century – or on a specific vocational pathway such as the pedagogy of dry stone walling (Farrar and Trorey, 2008).

There are other factors at play, too. TVET is all too often seen as the 'poorer cousin' of academic education. In reality vocational pedagogy is a more complex concept to

understand than its academic counterpart precisely because it takes place across two contexts – workplace and education space – and because it has crucially to involve both teachers and employers in its delivery.

In some countries vocational pedagogy is widely debated. There are lively and well-informed discussions about how best to teach vocational education. In the United Kingdom, for example, an independent commission was recently set up specifically to look at both research and practice of TVET and make recommendations about improving pedagogy (McLoughlin, 2013).

Despite many brave attempts, there is not yet an international consensus as to the essential aspects of vocational pedagogy. But what vocational pedagogy is really matters. It forces us to think about the wider goals of vocational education and thus to improve its status. Thinking about pedagogy helps us to understand that vocational education is worthy of serious study. Once grasped more comprehensively, vocational pedagogy enables us to develop models and tools that can help TVET teachers more effectively to match teaching and learning methods to the needs of their students and their contexts. Through such means vocational pedagogy can directly impact on the quality of teaching and learning.

The key message of the 2014 Education for All Global Monitoring Report on teaching and learning was very clear: there is a global learning crisis. Despite efforts to improve universal access to education, 250 million children are not learning even the basic skills (UNESCO, 2014), let alone the skills they need to thrive in the world of work. The report underlines that more efforts should be made to ensure that children have real opportunities to learn when they go to school and that governments invest in well-qualified and motivated teachers to ensure that all children are appropriately educated.

The importance of good teachers is just as critical for technical and vocational

education and training. TVET teachers have a distinctive role to play: not only do they need to be experts in their subject with a sound understanding of its pedagogy; they also need to have practical and up-to-date vocational expertise relevant to the workplace.

It was with these kinds of questions in mind that we recently undertook wide-ranging research to seek to provide some answers and to stimulate debate about vocational pedagogy (Lucas et al., 2013). Specifically we wanted to clarify the goals of vocational education and articulate the full range of desirable learning outcomes associated with TVET before considering the kinds of choices which teachers can take in selecting the most appropriate learning and teaching methods to deploy with their learners.

Scope and objectives of the virtual conference

The objective of the two-week virtual conference on Vocational Pedagogy on the e-Forum was to explore vocational pedagogy – what it is, why it matters and how teachers can put it into practice. Between 12 to 26 May 2014, 197 Participants from 65 different countries virtually attended the online conference.

The discussion focused on four broad topic areas:

1. Aspects of vocational pedagogy of most interest to participants
2. The concept of signature pedagogies
3. Why a broad conception of TVET matters
4. The qualities of a great TVET teacher and how these can be cultivated.

The moderator would like to thank e-Forum members for their active participation and generous sharing of experiences, tools and papers. This report summarizes the main issues raised, indicates some promising lines of thought and concludes with a series of suggested action points.

Summary of discussions

The background note to the e-Forum made clear an interest in asking some fundamental questions about the bigger picture of TVET, especially the breadth of learning outcomes desirable in today's complex society, a topic returned to in section c. Specifically it was argued that you cannot develop a plausible description or theoretical underpinning for vocational pedagogy unless you are prepared to ask and answer some fundamental questions about vocational education. Figure 1¹ indicates this line of thinking more precisely:

This was the frame through which the subsequent discussions were mediated.

a) Key aspects of vocational pedagogy

The discussion began with an invitation to participants to bring their own experiences to bear on the topic and indicate their own interests. Contributors suggested the following:

- **The challenge of teaching learners with limited literacy and numeracy:** Many learners have difficulties with reading and writing yet still need to be supported to develop skills and expertise. Sometimes it is a case of not mastering the language of instruction, in which case ICT translating software can help. More fundamentally when learners have limited basic literacy it calls upon great skill and creativity on the part of the teacher. Methods such as practical hands-on demonstration, the use of annotated pictures, simple forms, videos and story-boards were suggested.
- **Building skills for disabled learners:** This important topic was raised early on in the discussion and is something which participants perhaps found too

¹ Figure taken from Lucas et al. 2012. How to teach vocational education: a theory of vocational pedagogy. London: City & Guilds.

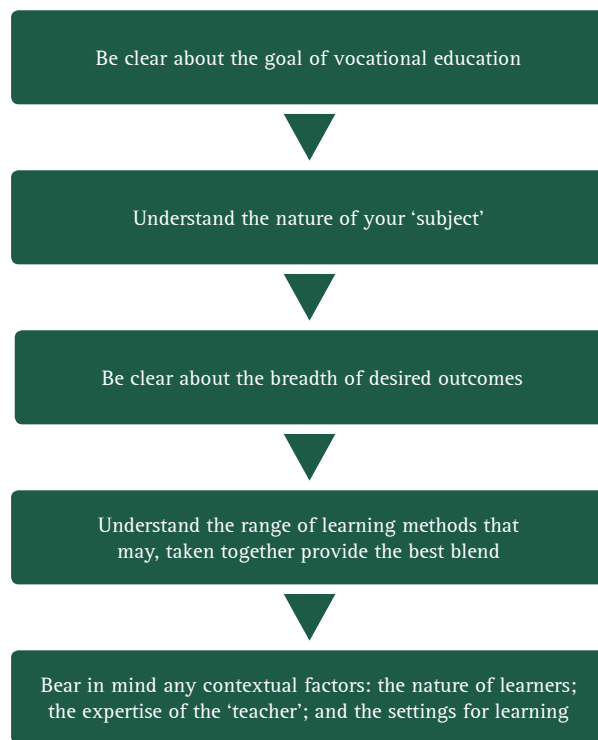


Figure 1. The theoretical underpinning for vocational pedagogy

daunting to explore but one which undoubtedly needs more understanding.

- **Our growing knowledge of how people learn:** Various issues were raised under this broad topic including the distinction between adult and younger learners or, as some prefer to say, andragogy rather than pedagogy (Knowles, 1984). On this matter, opinions from contributors varied, with some indicating that learning how to learn is fundamentally age-neutral, while others preferring to focus on the ways adults bring additional challenges to the TVET 'classroom'. Also raised were various seminal figures in thinking about learning in general who also had specific insights to offer with regard to TVET; for example, the three-dimensional model espoused by Knud Illeris (2002) was mentioned. This was picked up by one contributor as a means of understanding the 'learning by doing' approach much employed in TVET and which exemplifies hand, mind and body working together in harmony. One person reminded us of the powerful influence of John Dewey, writing a hundred years ago and, earlier still, the enduring legacy we owe to Frederik



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Grundtvig and his attempts to popularize education beyond universities, a memory kept alive today in the EU programme for lifelong learning with his name². As one contributor put it, "knowing what to teach is important but how to teach it is much more important". And as another suggested, the issues of student-centred or more 'constructivist' pedagogy can all too easily get subsumed within larger debates. Yet at a very practical level deep understanding of problem-based learning and of peer teaching and learning is essential.

- **The tension between vocational and 'general' pedagogy:** the actual or perceived differences between these two branches of pedagogy were discussed. Some contributors pointed out the necessary instrumentalism or task-orientation of TVET with its focus on developing skills in people for the world of work. Others explored the similarities which exist between the two by focusing on methods which work well in many contexts. One contributor was able to reflect with the direct personal experience of having taught

in both strands of education. Reading all of these comments it was impossible not to be reminded of the fact that TVET is always going to have the additional challenge of operating across the two contexts – work and learning – in which it has to sit, whereas general education resides in the classroom or workshop only and its eventual 'use' is much more varied.

- **The social aspects of learning:** As well as focusing on the development of competence and skills, participants were interested in the social dimensions of learning, both between teacher and learner and between learners and their peers.
- **Generic or key skills:** This important issue surfaced in a number of ways. First there is the issue of how you teach both generic and specific vocational skills. Then it was asked whether the apparent dichotomy between 'hard' and 'soft' skills is helpful. And finally there was a line of discussion about the necessity of embedding functional and other skills within specific vocational pathways (see also section b).

² http://eacea.ec.europa.eu/llp/grundtvig/grundtvig_en.php

b) The concept of signature pedagogies

The concept of signature pedagogies, developed by Lee Shulman, refers to the types of teaching that best match the fundamental ways in which any one vocational group thinks and acts.

Signature pedagogies make a difference. They form habits of the mind, habits of the hand and habits of the heart.... they prefigure the culture of professional work and provide the early socialisation into the practices and values of a field. Whether in a lecture hall or a lab, in a design studio or a clinical setting, the way we teach will shape how professionals behave... (Shulman, 2005)

Different professions and crafts, the argument goes, have certain distinctive habits of mind which can be actively cultivated – or discouraged – by the choices teachers make in selecting learning and teaching methods.

The example given by the moderator was of research undertaken by the University of Winchester for the Royal Academy of Engineering in which it was concluded that there are indeed certain signature pedagogies which are likely to develop learners who truly think and act like engineers (Lucas et al., 2014). These pedagogic methods have problem-based-learning and the iterative engineering design process at their heart. The reason that we lack engineers in some branches of engineering is, arguably, because engineering is too often taught with an unhelpful over-separation of theory and practice.

Reactions from participants to the concept of signature pedagogies were unanimously positive. Some had heard of the idea and were already exploring it. Others were intrigued to discover it and consider it for the first time.

One participant suggested that the only real signature pedagogy is to actually do what the vocation in question requires when you are learning it! So, engineers learn by using engineering design. Broadcasters do broadcasting and so on. Of course there is a grain of truth in this. But the teaching

environment requires more precision and more variety of appropriate learning methods from us. So, to take the example of broadcasting, it might be that the closest thing to broadcasting is actually a simulation in which certain versions of what you might experience could be practised. And participants suggested many specific examples of vocations and their signature ways of learning, including medicine, law, teaching, hospitality, hairstyling, window-repairing, windscreen repairing, glazier, aluminium joinery, scaffolding and abseiling.

The entries towards the end of the list above are what might be called 'trades' and one participant made the intriguing suggestion that these specific examples may be more diverse than, say, teaching or medicine. There was the distinct sense that it was time for occupations like these latter examples to recognize that they, like law and teaching, also have their own distinctive habits of mind and ways of acting and that these need to be reflected in their pedagogy.

In practical terms TVET teachers often need to balance their vocational expertise with their teaching capability, and the signature pedagogy concept usefully brings these two aspects together.

While participants found the notion of signature pedagogies interesting, they also pointed out the danger of getting too stuck in thinking about a specific subject given the need for TVET to focus also on broader, transferable skills. So, for example, it was suggested that team-based learning was in essence a signature pedagogy of all vocations.

Participants liked the possible way of distinguishing different kinds of vocational education by emphasizing the medium through which the work is expressed, so, focusing on working with:

- *physical materials* – for example bricklaying, plumbing, hairdressing, professional make-up

- *people* – for example financial advice, nursing, hospitality, retail, and care industries
- *symbols (words, numbers and images)* – for example accountancy, journalism, software development, graphic design.

Figure 2³ groups a selection of vocational subjects according to this organizing principle. While subject/course names may vary across the world, it is hoped that the principle is clear.

c) Why a broad conception of TVET matters

The briefing paper for the e-Forum made the case that, for TVET to have the status it deserves, a broader vision of the kind of learning outcomes it offers is required and this was the next issue participants explored.

³ Figure taken from Lucas et al. 2012 How to teach vocational education: a theory of vocational pedagogy. London: City & Guilds.

Traditionally vocational education outcomes are framed in terms of skills or competencies relating to particular vocational domains with, recently, a greater interest in what are increasingly referred to as twenty-first century or wider skills.

But arguably there are a number of other capabilities that make up the working competence of a vocational worker, and these add to – rather than being a different set from – the set of capabilities required of an 'academic' worker. The six outcomes proposed to the e-Forum were:

1. routine expertise (being skillful)
2. resourcefulness (stopping to think to deal with the non-routine)
3. functional literacies (communication and the functional skills of literacy, numeracy and ICT)

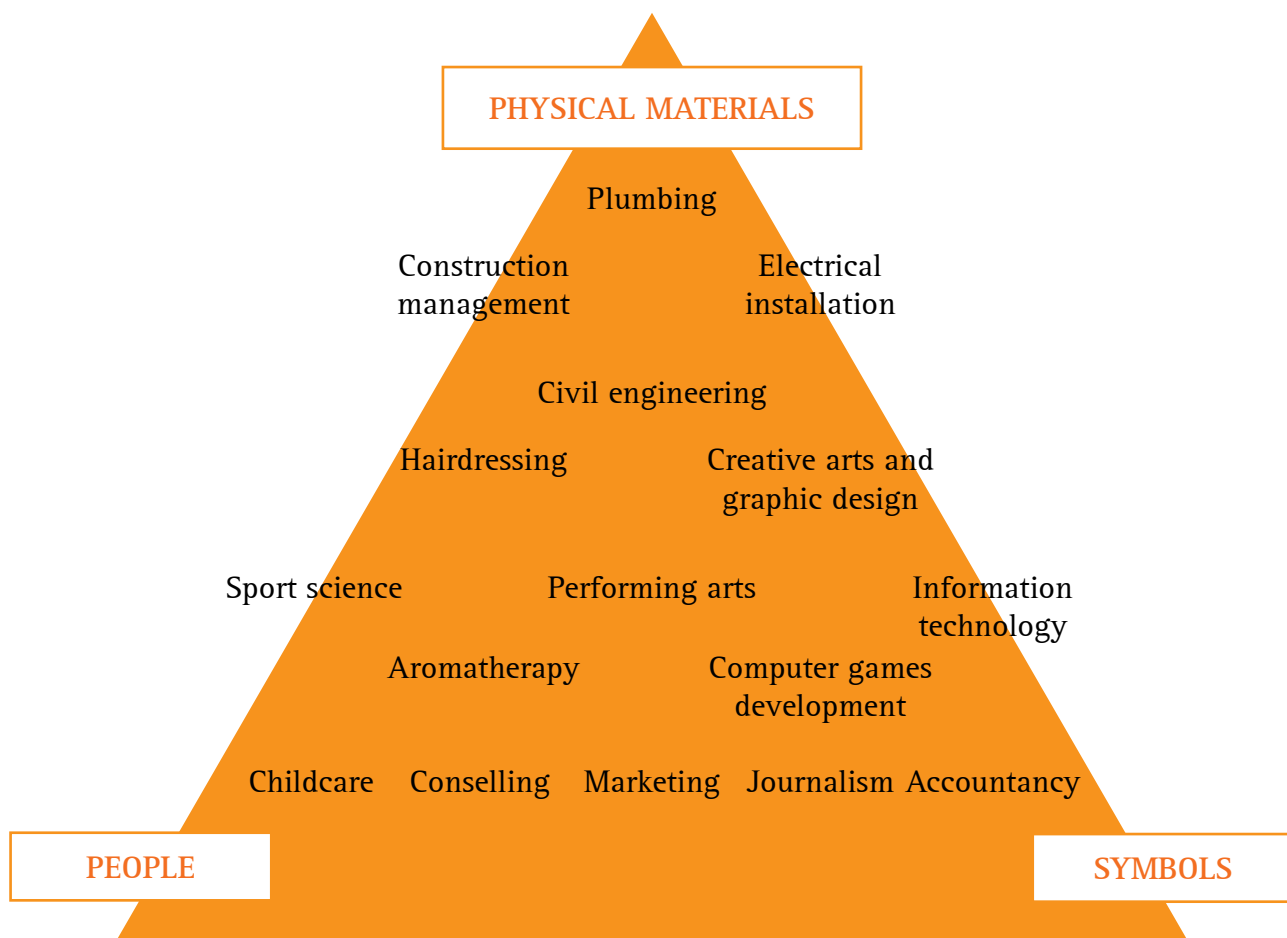


Figure 2. Vocational subjects according to the medium through which they are expressed

4. craftsmanship (vocational sensibility, aspiration to do a good job, pride in a job well done)
5. business-like attitudes (commercial or entrepreneurial – financial or social – sense)
6. wider skills (for employability and lifelong learning).

Routine expertise is at the core of working competence. It involves skilled routines and the ability to carry out skilful activities to a satisfactory standard. It relates to the use of materials, tools and abstract concepts. Acquiring practical expertise requires time and practice. Anders Ericsson has suggested that typically it takes 10,000 hours to become an expert (Ericsson et al., 1993).

Resourcefulness. Sometimes we need to stop and think. We encounter something which is not routine and need to be able to respond accordingly. Beyond the familiar

and routines, expert practitioners are able to bring to mind knowledge that is applicable to new and unfamiliar contexts. Learners need to be able to apply knowledge in a range of situations that do not closely replicate those already encountered in training.

Craftsmanship is something we consider to have been much lacking in the literature of vocational education. Mike Rose (2005), Richard Sennett (2008) and Matthew Crawford (2010) all make strong cases for this outcome. Craftsmanship, as Ron Berger has shown (2003), is about the pleasure, pride and patience involved in doing a 'good job'.

Functional literacies make up a slightly broader category than the functional skills of literacy, numeracy and ICT. There are live debates today about how best to teach these kinds of functional literacies. Some argue for them being embedded in authentic



contexts and therefore likely to be taught by vocational teachers. Others suggest that they are better learned from specialists.

Business-like attitudes are also essential. Work may not, of course, be 'for profit'. Many services, for example in social services and housing and the environment are 'third sector' and not run for profit. A business-like attitude would manifest itself in behaviours such as punctuality, orderliness, willingness to put in necessary time and effort, and displays of customer service that exceed client expectation.

Wider skills. As the end of the 20th century approached, one of the most pressing questions of education related to the sorts of competencies the 21st century would demand. The sorts of 'wider skills' deemed important are many and varied, and are described variously as 'broader skills', 'competencies', 'dispositions', 'capabilities' and 'habits of mind'. Employers regularly call for employees with wider skills such as problem-solving, team-working, resilience and entrepreneurialism, in addition to high-level basic skills.

While participants agreed with this list of proposed outcomes for TVET, there were the fewest number of contributions to this part of our discussions. Initial contributions were strongly in favour, with participants suggesting additional ways in which TVET outcomes need to be driven by broader values. One contributor encouraged participants to consider cognitive scientist Roger Shank's emphasis on learning by doing and its implied values (Shank et al., 1999) – learning to do (skills), not just to know (factual knowledge); learning that occurs in the context of a goal that is relevant, meaningful, and interesting to the student; and content knowledge that is learned in the context of relevant tasks closely related to how students will use it outside the learning environment.

Another participant argued that the cultivation of wider skills or transversal competencies was the most important, arguing that the best way

to develop these was through a combination of reflective active learning such as role play and the use of case studies. In another contribution the phrase 'learning to learn skills' was used to describe this desired outcome with helpful suggestions as to how these needed to be embedded in a specific occupational context.

In response to the idea of developing resourcefulness, one contributor bemoaned the tendency to produce learners who behaved like robots.

It was suggested that, for policy-makers, the uniqueness of TVET is sadly not yet fully understood.

d) The qualities of a great TVET teacher and how these can be cultivated

The final topic of the virtual conference invited participants to suggest, in the light of the previous discussions, the characteristics of a great TVET teacher. There was a very large and interesting range of suggestions which are summarized below:

A great TVET teacher is:

- passionate and dedicated
- a great facilitator
- a leader of learning
- an excellent communicator
- a motivator
- a positive thinker
- a creative problem-solver
- ICT-literate
- respectful of learners, prepared to show care for students' well-being and able to identify their needs
- a lifelong learner and reflective practitioner
- able to evaluate delivery and impact
- personally well-rounded – fair, empathic, patient, stable, reliable
- kind

- a listener
- strict and coherent
- pedagogically very competent in a wide range of teaching and learning methods.

Ultimately participants suggested a great teacher is values-driven and an expert in *both* their vocational field *and* in vocational pedagogy.

There was realism (and humility) among the e-Forum participants in recognizing that not all TVET teachers are great or even good. Suggestions as to how teachers can be developed included:

- better initial training
- the use of teacher fora to raise

- and solve problems and issues
 - TVET professional learning communities
 - ongoing studying and training
 - the use of constructive feedback
 - opportunities to see other teachers in action
 - opportunities for vocational experts to share and 'unpack' their expert understandings and practise techniques
 - mentoring
 - effective collaboration with government
 - effective collaboration with employers; effective funding allocation
- all in a context of clear national strategies for the promotion of TVET.



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Conclusions and a recommendation

From this virtual conference it is clear that across the world TVET is being delivered by passionate and thoughtful educators.

The topic of vocational pedagogy is one that has struck a chord with many participants and, while our contexts and cultures may be different, there is a remarkable consistency of viewpoints.

Five conclusions emerge:

1. Vocational pedagogy is complex and very much worthy of further study, arguably more so than general or academic pedagogy on account of lower levels of current interest in it among teachers and academics.
2. Understanding vocational pedagogy is critical to the improvement of learner outcomes in TVET and can help to improve the status and quality of TVET.
3. There is agreement that the desired outcomes of TVET are broader than merely producing work-ready, competent, skilled people, important as this is. Indeed if TVET is truly to be esteemed, then its wider outcomes need to be explicitly acknowledged.
4. The concept of 'signature pedagogies' offers one useful way of enabling TVET teachers better to match their choice of teaching and learning methods to the characteristic ways of thinking and acting of the vocational pathway for which they are preparing students.
5. To be a great TVET teacher requires a paragon of virtue, knowledge and skill! It is arguably an even more challenging role than being a general education teacher in schools because its contexts are more varied. It requires expertise in both a vocational field and in vocational pedagogy. And this combination, in turn, requires TVET teachers to have a confident and expansive view of the full

range of outcomes which their teaching can release from their students.

Developing a more sophisticated and practically useful understanding of vocational pedagogy is more a journey than a destination and in this spirit I offer the following recommendation: that UNESCO, international agencies, national governments, research bodies, employer organizations, individual TVET institutions and, above all, TVET teachers continue to explore the topic of vocational pedagogy to ensure better learning outcomes for all the students they teach.

Specifically these groups might like to:

UNESCO and other international agencies

- continue to commission and publish research into vocational pedagogy to build an international reservoir of knowledge
- bring expert TVET researchers and TVET practitioners together to explore issues and share thinking and practices more often
- advocate to national governments the importance of building national capability in understanding and applying best thinking in vocational pedagogy.

National governments

- adopt a broad definition of the wider desirable learning outcomes of TVET
- establish a centre or network of centres capable of commissioning and sharing research into best practices in vocational pedagogy
- create funding streams to commission research into vocational pedagogy
- ensure national bodies with responsibility for standards in TVET and for the training and certification of TVET teachers incorporate a real understanding of best practices in vocational pedagogy into their systems
- create a network of TVET centres which are test-beds for new approaches to vocational pedagogy

- celebrate good TVET teachers and innovations in pedagogy.

Research bodies

- undertake and disseminate more research into vocational pedagogy
- collaborate with other research bodies to undertake and disseminate more research into vocational pedagogy
- actively collaborate with TVET institutions to apply and evaluate new approaches to vocational pedagogy in a range of contexts.

Employer organizations

- invest in employee learning from apprenticeship to higher-degree level that seeks to develop a broad set of vocational learning outcomes
- work with TVET providers to identify the most effective teaching and learning methods for their vocation, its signature pedagogies
- encourage research bodies to undertake TVET research at their workplaces.

TVET institutions

- undertake and apply research into vocational pedagogy using techniques such as action research
- collaborate with other TVET institutions and research bodies to apply and evaluate new approaches to vocational pedagogy.

TVET teachers

- undertake and apply research into vocational pedagogy using techniques such as action research
- develop professional learning communities to explore common interests in vocational pedagogy
- participate in professional learning to explore aspects of vocational pedagogy and its application in practice
- actively engage with learners to make the processes of learning more visible.

Background resources and references

Berger, R. 2003. *An Ethic of Excellence: Building a Culture of Craftsmanship with Students*. Portsmouth, NH: Heinemann Educational Books.

Billett, S. 2013. *Learning through practice: beyond informal and towards a framework for learning through practice. Revisiting global trends in TVET*. Bonn: UNESCO.

Claxton, G., Lucas, B. and Webster, R. 2010. *Bodies of knowledge. How the learning sciences could transform practical and vocational education*. London: Edge Foundation.

Crawford, M. 2010. *The Case for Working with Your Hands: Or Why Office Work is Bad for Us and Fixing Things Feels Good*. London: Penguin.

Ericsson, A., Krampe, R. and Tesch-Römer, C. 1993. The Role of Deliberate Practice in the Acquisition of Expert Performance. *Psychological Review*, Vol. 100, No. 3, pp. 363-406.

Farrar, N. and Trorey, G. 2008. Maxims, tacit knowledge and learning: developing expertise in dry stone walling. *Journal of Vocational Education*, Vol. 60, No. 1, pp. 35-68.

Gamble, J. 2013. Why improved formal teaching and learning are important in TVET. *Revisiting global trends in TVET*. Bonn: UNESCO.

Illeris, K. 2002. *The three dimensions of learning: contemporary learning theory in the tension between the cognitive, the emotional and the social*. Roskilde: Roskilde University.

Knowles, M. 1984. *Andragogy in Action: Applying Modern Principles of Adult Education*. San Francisco: Jossey Bass.

Lucas, B. and Claxton, G. 2009. *Wider Skills for Learning: What are they, how*

can they be cultivated, how could they be measured and why are they important for innovation. London: NESTA.

Lucas, B., Claxton, G. and Webster, R. 2010. Mind the gap. Research and reality in practical and vocational education. London: Edge Foundation.

Lucas, B., Spencer, E. and Claxton, C. 2012. How to teach vocational education: a theory of vocational pedagogy. London: City & Guilds.

Lucas, B. and Claxton, C. 2013. Pedagogic Leadership: creating cultures and practices for outstanding vocational learning London: 157 Group.

Lucas, B., Hanson, J. and Claxton, G. 2014. Thinking like an Engineer: implications for the education system. London: Royal Academy of Engineering.

McLoughlin, F. 2013. It's about work: excellent adult vocational educational teaching and learning. London: Commission on Adult Vocational Teaching and Learning.

Perkins, D. 2009. Making Learning Whole: How seven principles of teaching can transform education. San Francisco: Jossey-Bass.

Rose, M. 2005. The mind at work. New York, NY: Penguin.

Sennett, R. 2008. The Craftsman. London: Allen Lane.

Schank, R., Berman, T. and Macpherson, K. 1999. Learning by doing. Reigeluth, C (ed.), Instructional Design Theories and Models: A New Paradigm of Instructional Theory. Vol. II, pp. 161-181. Mahwah, NJ: Lawrence Erlbaum Associates.

Shulman, L. 2005. Signature pedagogies in the professions. Daedalus, Vol. 134, pp. 52-59.

UNESCO. 2014. Teaching and learning: Achieving quality for all. Education for all Global Monitoring Report 2013/14. Paris: UNESCO.

Participation

Overview

Number of participants: 197

Number of countries from which participants came: 65

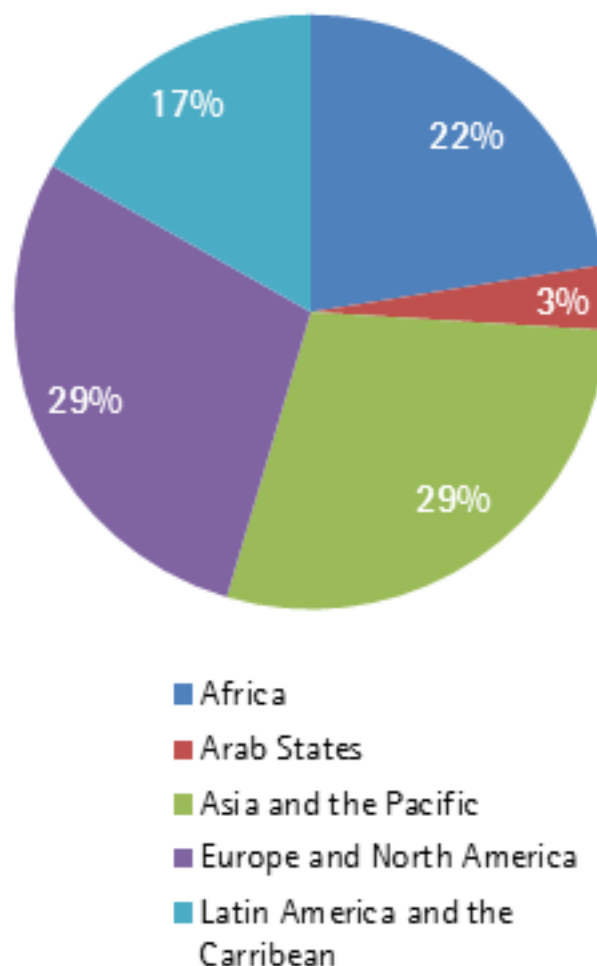
Network Members: 21 (11%)

Male: 104

Female: 79

Number of messages exchanged: 134

Regional distribution of participants



List of participants

Name	Institution	Country
Eleonora Sd	Cedefop	EU
Galeichubeloe Nnana	MIN OF EDUCATION BOTSWANA, GABORONE	Botswana
Sami Tesfaye Zegeye	Ethiopian Textile Industry Development Institute	Ethiopia
Awudu Damani Musah	GIZ, ACCRA	Ghana
Dan Baffour-Awuah	Council for Technical and Vocational Education and Training	Ghana
Ellen Olu Fagbemi	University of Education, Kumasi	Ghana
Modesta E. Gavor	University of Cape Coast, Cape Coast	Ghana
Paul Awuntumah Avorkah	Community Development, Accra	Ghana
Anne Polly Kagwiria Kithinji	Mombasa Technical Training Institute, Mombasa	Kenya
David Mutahi Muthoni	University of Nairobi, Meru	Kenya
Dr Karuiki	Kenyatta University, Nairobi	Kenya
Eunice Kerich	Rift Valley Technical Training Institute, Eldoret	Kenya
Moses Otieno Jaokoo	Youth Federation for World Peace Kenya, Nairobi	Kenya
Robert Okinda	Kenya Technical Teachers College, Nairobi	Kenya
Wilberforce Manoah Jahonga	Ol'lessos Technical Training Institute	Kenya
Saku Dukuly	Ministry of Education, Monovia	Liberia
Razafinimpiasa Hary	Institut national de formation des personnels de l'enseignement technique et de , Antananarivo	Madagascar
Frank Sumani	Domasi College of Education, Zomba	Malawi
Rajcoomar Ramchurun	Mauritius Qualifications Authority	Mauritius
Orah Isaac John		Nigeria
Abiola Abioye-Yusuff	Cummins, Lagos	Nigeria
Anthony Okwa	J. Hausen construction training center, Jos	Nigeria
Antonia Enudi Okuolu	Ministry of Poverty Alleviation , Asaba	Nigeria
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Bill's main research interests focus on learnable intelligence and embodied cognition. His research, often co-written with his colleague Professor Guy Claxton has been widely published.

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