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Strengthening TVET teacher education

Report of the UNESCO-UNEVOC
online conference

25 June to 6 July 2012

Moderated by Masriam Bukit



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Foreword

As part of its mission to support the global development of technical and vocational education and training (TVET) and fostering interaction and learning among TVET stakeholders from all over the world, the UNESCO-UNEVOC International Centre hosts the UNEVOC e-Forum, a virtual community of TVET experts from around the world who share information and knowledge about different aspects of TVET. To further promote focused debates on crucial themes in TVET, the UNESCO-UNEVOC International Centre introduced the moderator-driven e-Forum discussions. Through these discussions, UNESCO-UNEVOC aims to enhance awareness and encourage wider debate and understanding, including the sharing of promising practices and the formulation of new ideas in the field of strategy and policy development. The discussions, guided by an expert in the field, seek experiences, expertise and feedback and wishes to inspire people to take further action.

UNESCO and its Member countries consider teacher education as one of its principal priorities. The Shanghai Consensus, which was drawn on the basis of the discussions held at the 3rd International TVET Congress that took place from 13 to 16 May 2012 in Shanghai, China, highlighted the importance of expanding access and improving quality and equity in TVET, and clearly states the necessity for "developing effective policies aimed at improving teaching and learning processes." Specifically, it advocates for the development of "policies and frameworks for professionalizing TVET staff, and develop

and strengthen teaching standards for all levels." In line with this understanding, the 3rd moderator-driven discussion on TVET teacher education aimed to discuss the challenges and opportunities in this field, gather good practices and learn from experiences from the international TVET community.

From 25 June to 6 July 2012, a moderator-driven discussion was held on the topic of TVET teacher education. The conference attracted over 150 participants from more than 50 countries. The 12-day discussion touched upon the various issues in TVET teacher education and emphasized that the quality of TVET teachers is key in determining the skills of future workers. Qualified, trained and motivated teachers and trainers are essential for effective learning and are at the heart of TVET quality. The debate furthermore highlighted that the issues and challenges of TVET teachers are quite different from general teachers and thus require a distinct response in terms of skills and competencies that should be regularly updated alongside technological developments and linkages with industries.

The guest moderator for this online conference on TVET Teacher education was Dr Masriam Bukit, a professor with over 40 years' experience in the TVET sector, since first working as a teacher in Indonesia. We thank him sincerely for providing his expert knowledge and full dedication to this exercise. Many thanks also to all e-Forum participants who shared their professional and personal experiences in the area of TVET teacher education.

Shyamal Majumdar
Head of UNESCO-UNEVOC International Centre

Introduction

It is widely acknowledged that the quality of teachers and trainers greatly influences the effectiveness of technical and vocational education and training (TVET) institutes in generating qualified and skilled workers. The effectiveness of any education system also strongly depends on the quality of interactions and relationships that occur between the teachers and students.

Changes in the world of work, founded upon rapid and widespread technological development, have significantly influenced the type of TVET programs that need to be offered. Furthermore, this has influenced the teaching and learning strategies employed by TVET teachers, rendering the nature of TVET unique from all other areas of teaching.

Existing systems generally tend to provide the same pre-service training preparation for TVET teachers as received by their counterparts across the wider field of teaching. 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. Efforts to strengthen TVET teacher education must therefore adopt a dual focus, incorporating both the pre- (training) and in-service phases. The UNESCO-UNEVOC online conference on TVET teacher education was initiated to determine the interrelated factors influencing the quality of TVET teachers, and to explore potential methods or approaches to strengthen TVET teacher education both in terms of pre- and in-service training.

The objective of this online conference was to encourage participants to share and discuss opinions, experiences, and ideas, forming

alternative solutions towards the greater effectiveness of TVET teacher education.

The discussion was guided by the following topics:

- Strengthening TVET teacher education through collaboration with industry;
- Motivating TVET teachers to build linkages with industry;
- Strengthening pre-service TVET teacher education;
- Enriching TVET teachers through continuing professional development.

Extracts from the discussion of each topic form the basis of this report. The depth of discussion differed between topics, reflecting the varying time and number of engaging participants.

Additional topics discussed during the 12-day period included:

- The preparedness of TVET teachers;
- TVET teacher education in different contexts;
- The importance of TVET teachers remaining qualified;
- Managing pre- and in-service teacher training;
- Incorporating research into the teaching and learning culture of TVET;
- TVET teachers' Professional Development Plans.

As the nature of such issues overlap with the main topics, they are covered under the main headings accordingly.

1. Summary of Discussions

a) Strengthening TVET teacher education through industrial collaboration

The participants considered industry an essential component in ensuring the effectiveness of TVET institutions in generating qualified and skilled workers. Linkages between TVET institutes and employers empower TVET teacher education through the acquisition of practical skills, positive professional attitudes, and the gradual development of teachers' understanding of working within industry. TVET institutes depend upon industry as a means of accessing the latest technology and practices, as well as indicating the level and types of skills

currently required. An effective relationship between TVET teachers and industries will thus ensure that TVET curricula and teaching methodologies are relevant and up-to-date. The participants believed that the close collaboration between TVET teacher education and industry would significantly improve the quality and relevance of TVET. The success of TVET teacher education (and therefore indirectly, TVET education) is highly dependent on the quality of linkages, emphasized by one participant's characterization as the "backbone" of TVET teacher education.

The discussion regarding the importance of industry linkages was deeply enriched by participants' perspectives and experiences within the context of developing countries. Several participants indicated that many industries tend to show reluctance in supporting TVET, highlighting the contradiction that employers often choose



not to contribute towards the needs of TVET despite themselves needing ready-to-work skilled workers. One participant from Egypt suggested that only a small minority of industries are willing to participate in TVET, as they are typically not convinced of the capacity of TVET institutes and do not trust them to generate qualified skilled workers. Other participants remarked that most TVET institutes in developing countries are also unable to understand the needs of industries, and subsequently lack an awareness of how to approach and engage with them.

One participant stressed the mutually dependent relationship between TVET and industry, highlighting that both sides suffer disadvantages from failing to collaborate effectively. TVET would fail to generate qualified skilled workers, necessitating industries to invest in in-house training or take the risk of hiring unskilled workers, liable to producing low quality products. This would ultimately impact wider society, with consumers absorbing the failings of unproductive TVET institutes through higher prices for goods due to inefficient workers. Such a situation would render negative impacts in terms of both human resources development and the national economy.

The benefits of TVET teachers collaborating with industry

Many participants offered a description of today's TVET teachers, suggesting that most do not possess a strong background of industrial working experience. Those who are less familiar with new technologies and required skills were typified as lacking enthusiasm to collaborate with industry. Moreover, many participants emphasized industry as the primary source of information for TVET teachers to establish their teaching modules. Close collaboration provides TVET teachers with the opportunity to access information concerning the latest technologies used within industry, which can form the basis of suitable teaching modules. Theoretical modules are developed based on modern sciences, while hands-on modules

focus on skills and working processes in practice within industries. Such modules need to be adapted with 'soft skills' to understand working competencies and standards in the industry. This includes an awareness of the practical purpose of a theory, its linkage with modern technology, associated skills and competencies, and whether it is currently practiced or alternatively outdated.

Different participants described the direct benefits of linkages from both the student and teacher's perspective. Industries provide students with the opportunity to observe their practices through partaking in internships, learning about appropriate working behaviour and culture. This also benefits companies in choosing prospective workers once they have completed their TVET education. Perhaps most valuably, through internship opportunities students are able to differentiate the importance and relevance of learning aims within the context of the world of work.

For curriculum development to meet the quality standards set by accreditation/certifying bodies, close collaboration between teachers and industries is essential, including support from industrial personnel. Within the DACUM process, curriculum development requires up-to-date information and receives legitimacy from working associations in the respective field of work in an industry. Working associations are usually involved in a type of curriculum commission to formulate curricula for TVET.

Developing linkages

Participants shared their experiences on how to initiate collaboration with industries in less industrialized countries, with many recommending the 'knocking doors approach'. Although sometimes perceived as inefficient, this approach represents a suitable means of initiating collaborations with un-cooperative industries in developing countries.

Due to the lack of industrial support for pre-service TVET teacher education, several

participants agreed that including industrial experiences as a basic qualification for TVET teachers represents a difficult challenge in most developing countries. In less industrialized countries, teachers could be trained in the knowledge and skills required to build industrial links as part of their pre-service training, enabling them to foster such linkages once in-service. This discussion prompted the suggestion that in the regions where it is difficult to gain industrial experience, "the skill to build the schools' linkages with industries" should be included as a basic qualification for a new TVET teacher.

Some participants conveyed their successful experiences in developing linkages between teachers or TVET institutes and industrial employers. Acknowledging the various existing challenges towards this aim, the establishing of strong linkage was typified as a long and gradual process. Generally, participants indicated that collaboration with industries should be constructed through continued personal efforts based upon a resilient dedication and willingness in the likely face of many rejections from the industry.

Win-win partnerships

Several participants highlighted the key to success in developing linkages between teachers and industries through its conception as a 'win-win partnership', whereby the TVET institute and industry gain equal benefit from the collaboration. The institute and its teachers should be able to provide suitable workers in accordance with the industry's needs. Furthermore, they could offer the expertise required by industries through training for both entry-level employees as well as their established colleagues, located at either the TVET institutes or the companies' premises.

Another participant cited a further notion of the win-win partnership, based upon manufacturing industries' clear need to modernize through changes in their production techniques. Under such circumstances, TVET teacher education could offer new technologies or working standards to be

used in industrial production. TVET teachers can be placed as part-time employees within industries, and selected employers can be assigned as part-time teachers. The industrial experiences of TVET teachers should be updated through such participation, at least for a certain period every year.

As discussed above, TVET institutes in less industrialized countries generally receive little support from industries. However, several participants shared their successful solutions towards remedying this situation, including TVET teachers introducing production-based learning activities in institutes, and trying to create practical jobs for students for saleable products. Production-based institutes offer dual benefits, namely that the institute earns income to meet its operation costs, and students learn the skills required to produce market-standard products. In many developing countries, production-based activities can provide income levels sufficient to support themselves, emphasizing the paradigm that "education pays for itself".

Teaching factories

Another approach introduced by one participant towards the aim of building relationships with industries can be classified as the advancement of production-based education, termed in Indonesia as a teaching factory. Teachers invite industries to host their production within the TVET institute, enabling students to learn the range and level of skills involved within the production process. Furthermore, teachers learn about the standard of quality required in the market, and about industrial working culture.

One participant highlighted the potential of successful teaching factories becoming established as institute-run enterprises, thus facilitating teachers to constantly improve their skill sets. However, unless such institutions can operate to meet market standards, they will fail to make profit and reflect a poor image to industries. However, the benefits of teaching factories are manifold: students can gain positive



reinforcement through observing their finished products being sold on the market, and can learn soft skills of punctuality, efficiency, team work, and a valuable insight into running a small business.

The above discussion reflects that the linkages between institutions with employers should be developed to strengthen TVET teacher education, to better facilitate its teachers to understand the conduct, standards and practices involved within the world of work.

b) Motivating TVET teachers to develop linkages with industries

Most participants supported the belief that institute-industry cooperation should be established and continuously harnessed. One individual shared notable success stories in developing linkages between colleges and industries in Canada and Nigeria, citing such achievements as reliant

on skill, courage and patience. Central to such aims is the motivation of teachers, which evolved into a focal topic within the discussion. A distinction was offered between well-trained and well-motivated teachers, suggesting that the latter element should be encouraged by TVET institutes to ensure that teachers are proactive in developing and maintaining linkages with industries.

Ensuring that teacher motivation remains positive

TVET institute management should develop intrinsic motivation for teachers to succeed in developing linkages with industry. This involves ensuring that working conditions- physical, social and psychological - function in a manner that exceeds minimum standards of quality. More specifically, motivated teachers should be supported by an advisory committee in their efforts to build linkages with industries.

c) Pre-service TVET teacher education

During the discussion, the opinion emerged that most pre-service TVET teacher preparation programs are offered to those who will be teaching in general secondary schools. During the four-year TVET teacher preparation, many TVET student teachers only receive pedagogic experiences, rather than any practical insight into industry.

Participants stated that their experiences of different institutions showed that lecturers prefer teaching largely obsolete theory-based TVET. It is evident that many lecturers still feel proud and comfortable teaching in a method rich in theory yet short on practice. Many TVET teachers enter the classroom and act according to what they were taught, and not necessarily what is best for their students. Consequently, the learning content is often misaligned with the realities and expectations of the learners.

In most TVET teacher institutes, no clear distinction is made between the pedagogical requirements of teaching TVET compared to others subjects within secondary education. Many TVET teacher educators still hold the opinion that the most important element of pre-service TVET teacher training is to master the technical subjects, with pedagogic knowledge and skills treated as an insignificant addition to the vocational subjects.

Participants generally agreed that TVET teachers should be trained according to the notion that TVET students have their own

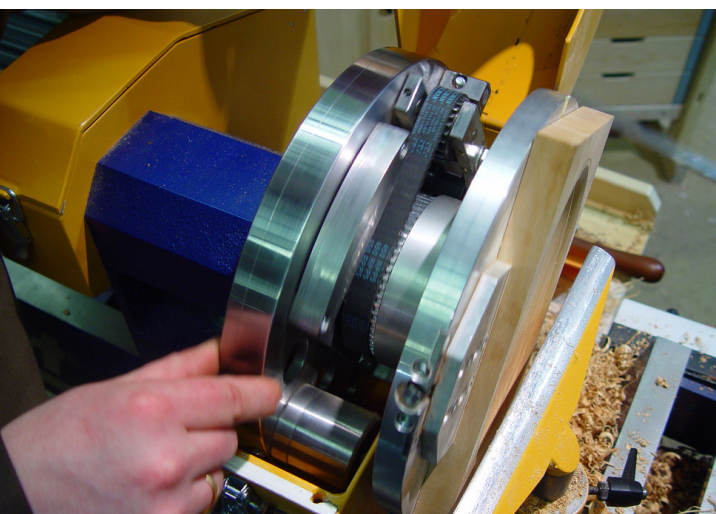
sub-culture and ways of learning. Pre-service teacher education should greater accommodate the specific teaching style of TVET, customized to meet the requirement of industries. Furthermore, Pedagogic programs should be accommodated to meet the nature of TVET congruent with the unique world of work.

Developing research as a learning culture

Several participants emphasized the need to develop research as a learning culture within TVET teacher education, citing the shifting expectation that research will become increasingly important in higher education. Research should be a central part of any teacher's education, prompting the question of how it should fulfil the specific needs of TVET teachers. It important to gain insight into the type of learning environment, teaching methods and appropriate learning materials to enable TVET students to learn most effectively, and also consider the development of their individual personality. The findings will vary across different TVET disciplines and professions, further underscoring the need for TVET teachers to develop research as a learning culture.

Key research questions raised included the appropriateness of curricula and their relevance towards students' future work, and whether the competencies imparted by TVET teachers are compatible with work processes. Curriculum research requires the development of concepts that form the basis of the relevant vocational discipline, including core knowledge about work, technology, education and training, and their relation to each other. Under the supervision of teacher educators, prospective TVET teachers should apply the related research in their final project works.

One participant highlighted several challenges faced by TVET teacher education in developing research to support learning and teaching. Requisite conditions include research funding, TVET teacher institutes widening



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the scope of what qualifies as a research project, the need for research collaboration with industries, and the importance of applied research in curriculum achieving far-reaching benefits for all stakeholders.

Several institutes have attempted to develop research organizations within TVET teacher institutes, to ensure that conditions are conducive to developing research activities. Such organizations develop research, and assist with learning and teaching manuals, programs, activities and habits within the institutes, also functioning as a research cell of the national TVET research centre. Reflecting on this discussion, one participant affirmed that it is difficult to talk about how to develop a research culture without re-thinking what research means within an institution environment.

d) Continuing professional development

Most participants recognized TVET teachers' need for continuing professional development, and during the discussion various reasons and justifications were stressed regarding its importance. Many developing countries have provided several centres for TVET teacher training; however some face the problem of teachers striving to obtain a higher academic degree at the expense of professional development. Continuing professional development has been misunderstood in some countries, because attainment of an academic degree does not prepare for TVET teachers for all aspects of their role, including changing technology.

The discussions also highlighted several success stories regarding continuing professional development, including keeping abreast with the development of new technology and industrial working methods, support with curriculum development, new qualifications, and training for the 5-year renewal license for TVET teachers. Despite the heterogeneity across different training programs, most participants agreed on the importance of

continuing professional development as part of a lifelong learning education, by applying the recognition of prior learning (RPL) approach. Some teachers may thus already possess the skills and knowledge that enables them to gain a qualification without completing a standard training or course. Selected continuing professional development programs could also be delivered through distance learning.

Professional Growth Plans

Some participants introduced the continuing professional development of TVET teachers under the term of a professional growth plan. With input from a supervisor, this is intended to outline a number of measurable activities of an individual teacher's development over a five-year period. The evidence can be collected in the form of a portfolio, which can be revisited every year to ensure that teachers remain on track with their progress. The teacher's main activities within their professional growth plan should be customized according to their individual needs. The list can be extensive, but in general would differ between a new and an experienced teacher. It is important that the individual teacher should take responsibility for their plan, rather than it being left entirely to the administrator.

One importance activity within the professional growth plan of a TVET teacher could be their release back into industry for a period of 6 months. This offered several benefits: the teacher would have an opportunity to network with practitioners in the field; they would learn about current techniques, skills, and work processes; and finally, employers might feel that what they are offering is appreciated by the TVET institute, and that the institute takes learning seriously.

One participant noted that any professional growth plan would not be effective unless the administrators could provide the necessary leadership and support. Naturally, if the teachers are well supported and their students succeed, this reflects positively

on the administrators. By incorporating documented semi-annual accountability into a portfolio, a more meaningful teacher development can be achieved. One key reflection of the discussion was that effective professional growth plans should be the joint effort between good teachers who want to better themselves and administrators who can provide the necessary leadership.

A central theme within the discussion was the developing of linkages with industry, and more specifically between TVET teachers and employers. This was characterized as fundamental in enabling TVET teachers to best prepare their students for the unique realities of the world of work. Many participants shared their successful experiences in this area, highlighting the need for a



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2. Lessons learnt

Contributions for this online conference commonly stressed the vitality of TVET teachers in generating skilled workers. Much of the discussion focused on the importance of TVET teachers' relationships with industries, with key related factors including the relevance of teachers' knowledge and teaching content, the effectiveness of pre-service training, and the importance of continuing professional development.

proactive and motivated approach and the conceptualization of industrial linkages as win-win partnerships with reciprocal benefits. Further to enhancing the preparedness of TVET students, greater collaboration with industries also serves to develop teachers' attitudes and competencies, and therefore maximum effort should be applied to ensure their motivation towards this aim.

The discussion placed equal importance on the different phases of pre- and in-service

training. In terms of the former, participants agreed that TVET teacher preparation should be developed more distinctly from other areas of teacher preparation, with specific emphasis on the unique nature of TVET and the realities of the world of work. Continuing professional development is similarly crucial in ensuring that TVET teachers remain qualified, current and relevant, and participants offered valuable recommendations in support of this notion in the form of professional growth plans. Moreover, efforts should be made to harness a research culture within TVET teaching, enhancing teachers' knowledge of work, technology, education and training in order to develop suitable curricula and teaching techniques.

3. Outlook and recommendations

The above discussions illustrate the importance of combined efforts towards the strengthening of TVET teacher education. Many interrelated factors exist that determine the effectiveness of TVET teacher education, including pre-service teacher preparation, continuing professional development, and teachers' collaboration with industry. Unless all such factors are considered and implemented appropriately, TVET teacher institutions will fail to generate suitably qualified TVET teachers. Each of these factors is elaborated upon in the recommendations below.

The pre-service preparation is a crucial stage in TVET teachers' education. As it represents the starting point on the long road to a teacher's improvement, it is necessary to overcome the pitfalls identified within TVET teacher preparation during this phase. Participants cited such existing failings including unclear pedagogic orientation and a lack of industrial experiences. They reflected that pre-service TVET teacher education should offer a clear pedagogic distinction compared with other areas of teacher preparation, and should better incorporate current practices, standards and technologies used within industry.

Continuing professional development is often misunderstood, with a greater emphasis placed on attaining higher academic degrees rather than relevant and applicable knowledge and skills in terms of changing technology and working practices. Continuing professional development is essential for TVET teachers to support their curriculum development and teaching methods, and also in terms of their teaching renewal license. The discussion promoted the concept of a professional growth plan as an instrument of continuing professional development. This would take the form of a customized and documented program emphasizing lifelong education through the acquisition of relevant knowledge and skills, including teachers' active participation within industries.

The strengthening of linkages between TVET teachers and industries is considered as crucial in preparing students to meet the dynamic work requirements. Several participants highlighted that many industries tend to show reluctance in supporting TVET, and that many employers do not wish to participate in helping TVET to meet its needs. However, many TVET teachers do not have an industrial background and working experience, and therefore often lack the understanding or motivation to engage with industries. TVET teachers should be encouraged to develop such linkages, stressing the mutual benefits to both students and employees. This notion prompted the concept of teaching factories whereby TVET institutes host production, enabling students to observe and engage with industrial processes and to learn about the practices, standards and soft skills necessary to succeed in the field of TVET. Such win-win partnerships should be encouraged to ensure the greater effectiveness of teachers and ultimately the preparedness of TVET students for the world of work.

Additional resources

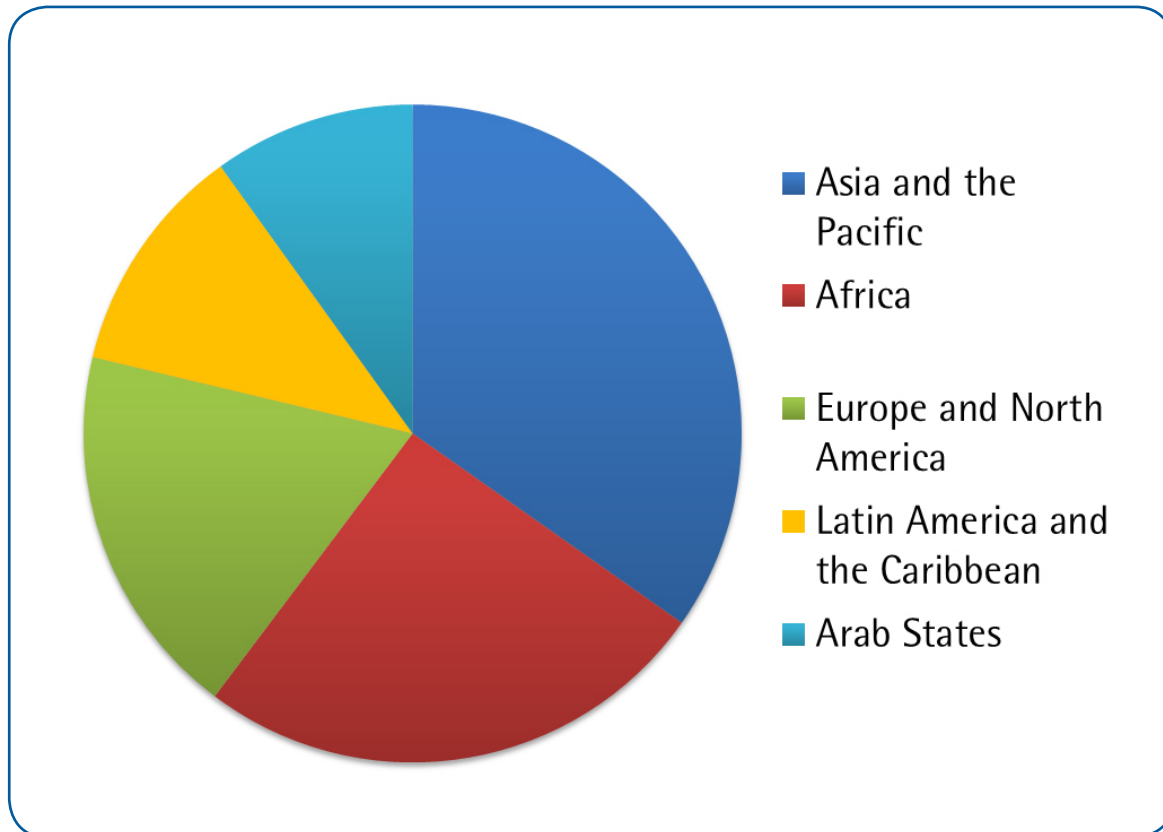
A number of resources were listed as preparatory reading for the moderated online discussion and more were added during the discussion period. Of course there are many other resources on the topic, but this list is restricted to those that were referred to as part of the online conference.

- Introduction video by Masriam Bukit
- New Challenges in TVET Teacher Education by Shyamal Majumdar, UNESCO-UNEVOC, 2012
- TVET Teacher Education on the Treshold of Internationalisation (UNESCO-UNEVOC/InWent, 2006)
- Teachers and trainers for the future - Technical and Vocational Education and Training in a changing world (ILO, 2010)
- Preparing TVET Educators for the Next Generation (EDUCON international conference 2011)
- Handbook of Technical and Vocational Education and Training Research (UNESCO-UNEVOC, Felix Rauner and Rupert Maclean, 2009)
- Standardisation in TVET Teacher education (Joachim Dittrich et.al., 2009)

Annex

Participation

- Number of participants: 152
- Number of countries from which participants came: 55
- Number of active contributors: 38



About the moderator



The discussion was moderated by Dr. Masriam Bukit, a professor with over 40 years' experience in the TVET sector, since first working as a teacher in Indonesia. Professor Bukit has extensive experience in the field of TVET teacher education, specializing in bridging the gaps between pre-service TVET teacher

preparation, in-service training and TVET education. His expertise has focused on standardizing the curriculum and modelling TVET teacher education, and from 2005 to 2008 he was a partner in a four-country (Germany, Indonesia, Malaysia, and Spain) project on standardizing inter-country TVET teacher education. He is currently engaged in supporting a Regional Cooperation Platform (RCP) for the development of TVET teacher education in the South-East Asia region.

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