

Technical and Vocational Education and Training:
Issues, Concerns and Prospects 16

Felix Rauner · Lars Heinemann
Andrea Maurer · Bernd Haasler
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Competence Development and Assessment in TVET (COMET)

Theoretical Framework
and Empirical Results

 Springer

Competence Development and Assessment in TVET (COMET)

Technical and Vocational Education and Training: Issues, Concerns and Prospects

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Foreword by Book Series Editor

In the twenty-first century, vocational education is changing increasingly rapidly in response to a move from traditional manufacturing to hi-tech industries, the production of value-added products, and the ever increasing expansion of service and communications industries. Attention is increasingly focusing on meeting the needs of those transitioning from schools to the workforce, or tertiary education, particularly those following a vocational pathway.

The unification of a qualifications system for vocational skills has been a key issue for TVET for sometime. Currently governments in over 100 countries are designing, implementing, or considering national qualification frameworks (NQFs), or are involved with regional qualifications frameworks. Interest in NQFs arises because of the issues of relevance, flexibility, and portability of skills and training, and the effects on employment opportunities. Countries have adopted different approaches to NQFs, but the underlying motives driving the process are usually similar. These include the need to strengthen links between education, training, and the labor market; the need to ease the process of labor mobility across employment sectors, regions, and countries, including lifelong education and training; recognizing prior learning experience and credits; setting standards based on learning outcomes; facilitating quality assurance; and improving the perceived status of TVET.

This book rises to the challenge of developing an international and portable assessment framework, through the use of “Competence Development and Assessment in TVET”, referred to as COMET. This is an effort to test for competence diagnostics in vocational education and training, testing the developed methodology in the area of electrical engineering, with extension to other occupations. Vocational education and training is viewed as a complex field that poses high demands on the development of large-scale assessment frameworks, especially for international comparative testing.

The authors describe how vocational education is characterized by a variety of particular circumstances that makes it very difficult to implement an international comparative competence assessment. The number and diversity of occupations do not allow occupations to be grouped in comprehensive competence fields across occupational domains. Previous efforts to overcome this through the adoption of the

concepts of general technological literacy for engineering and technology, and economic literacy for business and administration, were not successful. It is also acknowledged that qualifications are subject to significant change, particularly due to rapidly changing technology and greening economies. The development of occupational profiles and training requirements is a constant challenge.

This book provides a detailed and systematic approach taken in developing and testing the COMET methodology, and as such the authors' contribution to better understanding the world of TVET is gratefully acknowledged.

March 2012

Rupert Maclean
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Preface

The project COMET – “Competence Development and Assessment in TVET” – is an ambitious effort to test a methodology for competence diagnostics in vocational education and training in the course of a study that focuses on two occupational profiles in the domain of electrical engineering and currently is applied to other professions as well. Especially as regards international comparative testing, vocational education and training is viewed as a heterogeneous and complex field that poses high demands on the methodology of large-scale assessment.

First, internationally established professions can be found predominantly in the crafts and healthcare sectors. In industry and commerce, on the other hand, the tendency towards the internationalization of occupational profiles is much weaker. The “World Skills” can be regarded as an indicator of the internationalization of curriculum development. After all the number of occupations that participate in this competition has grown to approximately 50 in the meantime, including modern industrial occupations like mechatronic.

Another obstacle for the establishment of an international comparative competence assessment in the field of vocational education and training are the different national VET systems with their dual, school-based and alternating forms of vocational learning.

From a scientific point of view, one of the assets of the methodology for competence assessment presented in this volume is the fact that it allows to measure not only professional competence (and its development) but also the development of professional identity and the ensuing occupational commitment. The teachers who were involved in the development of the COMET concept are predominantly interested in the methodology under a pedagogical perspective. This interest is met by the evaluation and measurement tools insofar as the latter are particularly suitable for supporting the teachers in the implementation of the syllabi, which are structured on the basis of “learning areas”. Therefore, the COMET toolbox can also be used as a didactical and methodological support for the planning of school lessons.

The objective of vocational education is the impartation of professional competence in the sense of the ability to act in a professional context. Therefore, *school-based* types of vocational education are followed by a phase of practical training on

the job, and work placements are usually integrated into the curricula of full-time vocational schools. The *vocational* orientation of the various types of VET is an essential prerequisite for comparative competence assessment in this domain. This requires a competence model that can be used as a basis for the measurement of individual competences and competence development as well as for the evaluation of vocational learning processes.

Professional competences are developed in (dual) vocational education and in the process of cooperation between different learning venues. The professional work experience is of crucial importance for the development of competence and vocational identity. The COMET test results represent the learning and development processes at the two learning venues of dual VET (school and company) and can therefore be used as well for the further development of the cooperation between them.

The detailed analysis of the first project phase is expected to yield information and insights for policy makers and VET practitioners concerning the organization and design of vocational education and training processes in an unprecedented depth. The publication of the theoretical framework is expected to stimulate a more intensive debate about the development of learning methods in the vocational education and training system and to give a powerful impetus towards the transnational development and establishment of a high-performance methodology for VET assessment.

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Introduction: Competence Diagnostics in Vocational Education – What For?

“Competence diagnostics in vocational education – what for?” This question is well justified. If we only focus on the German context, since the early 1970s the BLK pilot programme of the federal and *Länder* governments in Germany has triggered a broad range of innovation processes, which contributed to a nationwide modernization of vocational education. The same is true of pilot programmes in the business sector (*Wirtschaftsmodellversuche*) under the aegis of the Federal Institute for Vocational Education and Training (BIBB), which were concerned with the support of innovation in training in enterprises. The development and implementation of methods of competence assessment as a basis for comparative competence diagnostics has never been a topic of these innovation programmes.

The focus has been on

- The modernization of occupational profiles and curricula
- The replacement of subject-based learning by a concept of learning that is based on vocational learning fields
- The testing of new media
- The improvement of the cooperation between learning venues
- The re-establishment of learning in the work process
- The development and testing of didactical concepts on new technologies as a core topic of vocational education and training programmes
- The testing and dissemination of action- and assignment-oriented learning

The list could be extended. It gives an impressive picture of the diversity of aspects that have to be taken into consideration when the improvement of the quality of vocational education is at stake. The argument that the easy access to the two pilot study programmes has compromised the quality of the projects and consequently of the programmes themselves is both right and wrong. It is right in the sense that the pilot projects soon after their establishment abandoned the concept of (quasi) experimental research and redefined themselves as innovation projects in the sense of action research.

The focus thus shifted from the legitimization of decision-making processes for VET policy and VET administration on the basis of experimental research to the

organization of the interplay of scientific, practical, and administrative competence in “processes of change” with objectives that had to be negotiated in advance. In this innovation paradigm, the VET practitioners become the main actors, the “promoters” of innovation projects. Science and research have an accompanying and supportive role, and this is why the criticism mentioned above is also wrong at the same time. Accordingly the access of practitioners to the pilot programmes should depend on the quality of project ideas and the commitment of applicants rather than on the expertise in writing excellent project proposals. This reminder seems appropriate when it comes to initiatives for developing a large-scale competence research in vocational education because the diversity of paradigms, instruments, and methods for innovations in the VET systems should not get out of sight. They are still oriented towards the definition of good educational objectives, the selection of teaching and learning contents, and the advancement of learning methods and educational programmes.

What, then, is the point of a competence diagnostics for vocational education? The COMET project has two answers to this question. The first of these has been formulated by the teachers involved in the project. Their interest is to have access to a theoretically sound and empirically verified competence model and to corresponding testing methods in order to gain a better insight into the strengths and weaknesses of teaching and training. From this perspective the competence model and the methodology of competence assessment should be applicable as an immediate support for the pedagogical work of teachers.

The second answer is the one that applies as well to PISA and similar projects: a large-scale competence diagnostics as the basis for comparative assessment leads to findings whose importance is increasingly recognized by the governance and support systems of vocational education. Needless to say the new transparency engendered by this process also creates some suspicion on the part of VET practitioners as the quantification of results puts especially those under pressure who perform less well according to the test results. In any case the introduction of a model-based competence assessment generates a great variety of new knowledge on the quality of vocational education, which will be to the benefit of a constructive VET dialogue between all stakeholder groups in vocational education and training. Beliefs, prejudices, and illusions are replaced with sound knowledge on the basis of quantitative data. This facilitates cooperation at all levels of the VET system.

The COMET research team is well aware that there is a certain fascination about the quantitative results, which may prompt one to overestimate the range of the “facts” (see especially Sect. 1.5). The quality of good vocational education depends also on factors that cannot be quantified. It is correct, however, that the COMET methodology for the first time allows for an exact, model-based measurement of core dimensions of VET. Thus a new level of knowledge for the design and implementation of vocational education can be achieved. The discussion and estimation of the range of the data therefore serves also the end to evaluate the relevance of the test results and to draw the “right” conclusions. The depth of the analysis was assessed quite positively by all participants already at the end of the first project phase. From the point of view of educational planning the advantage of the research