Handbook of Technical and Vocational Education and Training Research

Edited by

FELIX RAUNER
University of Bremen, Germany

and

RUPERT MACLEAN
UNESCO-UNEVOC International Centre for Education, Germany

Section Editors: Nicholas Boreham, Peter Brödner, Jürgen van Buer, Thomas Deißinger, Martin Fischer, Philipp Grollmann, Winfried Hacker, Geoff Hayward, Uwe Lauterbach, Robert Lerman, Morgan Lewis, Georg Hans Neuweg, Paul Oehlke, Jeroen Onstenk, Jörg-Peter Pahl, Peter Putz, Felix Rauner, Eugenie A. Samier, Georg Spöttl, Lorna Unwin, Anneke Westerhuis

Springer

Editors
Prof. Felix Rauner
University of Bremen
TVET Research Group
Am Fallturm 1
28359 Bremen
Germany
felix.rauner@uni-bremen.de

Dr Rupert Maclean
UNESCO-UNEVOC
International Centre for Education
Hermann-Ehlers-Str. 10
53113 Bonn
Germany
r.maclean@unevoc.unesco.org

ISBN: 978-1-4020-8346-4 e-ISBN: 978-1-4020-8347-1

DOI 10.1007/978-1-4020-8347-1

Library of Congress Control Number: 2008942082

Printed on acid-free paper

9 8 7 6 5 4 3 2 1

springer.com

EDITORIAL ADVISORY BOARD

Table of Contents

Preface

Research on technical and vocational education and training (TVET research) is by now an internationally established focus of ↑educational research. The ↑internationalisation of TVET research is expressed by the annual conferences of the European research network VETNET, the research and development programmes in the domain of vocational education conducted since the beginning of the European integration process, and the inclusion of this discipline into the international programmes of ↑World Bank, ↑OECD, ↑ILO and ↑UNESCO to promote the development of TVET systems, especially in ↑developing countries. Even though vocational education and training is important for the global economy because it serves the qualification of skilled workers for the intermediary sector of the employment system, TVET research is still largely shaped by national traditions of vocational education.

The insight that vocational education cannot escape the dynamics of internationalised technological and economic development and that the establishment of international ↑labour markets depends also on the cross-border ↑mobility of employees has led to a growing interest in TVET research. The editors of the present handbook wish to make a contribution to support this development process and to promote the discourse within the international community scientific community of TVET researchers. This project was facilitated by the fact that the handbook had been published in German already in 2005. Of course the internationalisation of the handbook necessitated a thorough revision of many chapters as well as the inclusion of additional chapters and sections. The question whether the study and development of vocational education can be considered a branch of educational research in its own right was answered in the affirmative by the authors in the most convincing way. Accordingly one of the sections is exclusively devoted to ↑research methods.

TVET research builds on the contributions of a number of different ↑research traditions and disciplines. These range from ↑qualification research in industrial sociology to the didactics of the various ↑vocational disciplines. The core of TVET research has developed into an original and independent ↑research field that cannot be regarded as belonging to any other research tradition. Admittedly there are many commonalities with pedagogy, labour studies, sociology, economics and engineering in terms of ↑research questions, methods and results. Basic research with a view to the further development of TVET systems, occupations and occupational domains, and to the design and evaluation of vocational training processes, however, belong exclusively to the core of TVET research.

The challenges for TVET research have increased with the acceleration of technological and economic change and the readjustment of the relationship of internationalisation and ↑localisation in the qualification of employees. The latter can be viewed as the decisive factor for innovation and prosperity in the international competition for quality. With regard to the manifold tasks of TVET research, including the reflection of the foundations of vocational education, the shaping of vocational education and training in ↑pilot projects or the monitoring of international ↑TVET cooperation, this handbook aspires to be more than just a reference book to provide guidance and lexical knowledge on TVET research. The handbook is also intended as a tool that makes it possible to distinguish TVET research with all its domains in the competition with other research disciplines.

This handbook is part of a library of handbooks on vocational education and training to enable the international TVET community to fulfil their tasks and organise their work more and more in a professional way.

Parallel with the publication of this handbook, Rupert Maclean and David Wilson are publishing the International Handbook of Education for the Changing World of Work (Maclean/Wilson/Chinien 2008). This handbook consists of six volumes and stands out for an extensive portrayal of TVET taking into consideration all its abundant aspects and regional or sector related peculiarities.

TVET research can bridge the gaps between TVET practice, ↑TVET policy and educational research. This means that innovations in vocational education and training can increasingly draw on the resources of TVET research.

The present handbook with its 142 chapters is the collective work of 128 authors. Above all it is them to whom the editors wish to convey their gratitude. The handbook is the result of an excellent cooperation of one and a half years, to which all authors made valuable contributions not only with their texts, but also with their suggestions and their readiness to adhere to the very strict time-schedule. Special thanks are due to the section editors, who made an important contribution to the quality of the handbook by their conceptual suggestions and by the editorial supervision of the chapters in their sections with regard to style and content. With their help it was ultimately possible to present the first international Handbook of TVET Research in which the ↑research tradition related to vocational education and training is comprehensively documented with its ↑research problems, methods and results.

We are well aware that this is no more than one more step towards the ↑internationalisation of TVET research, albeit a big one. TVET research now has a reference point that allows for a more systematic differentiation and deepening of the international scientific discourse.

The organisation of the project was done by Brigitte Schweckendieck and Daniela Marschall. In addition to that, Ms Schweckendieck edited the voluminous indexes and created the printing template for the work. Anne Kirkham and Wolfgang Wittig collaborated in the editorial revision of the chapters. We also wish to thank the publisher, Springer International, for the attractive realisation of the handbook. Without the support of the Institute Technology and Education of the University of Bremen and the ↑UNESCO-UNEVOC International Centre in Bonn this project could not have been realised.

We, the editors, are responsible for the gaps that remain and last not least for the shortcomings of the handbook. We therefore wish to close with the invitation to the users of this handbook to send their critique and suggestions for improvements to us so that they can be considered in a future edition.

Bremen and Bonn, October 2008
Felix Rauner Rupert Maclean

Introduction

Vocational Education and Training Research – an Introduction

Felix Rauner and Rupert Maclean

Vocational Education and Training Research – an Introduction

Felix Rauner and Rupert Maclean

It was with the establishment of national and international research institutions at the latest that (technical and) vocational education and ↑training research became a central area of ↑educational research. The major steps in this regard were the establishment of the German Federal Institute for Vocational Education and Training Research (BBF) (1970), which was subsequently named Federal Institute for Vocational Education and Training (BIBB), the French Centre des études et des recherches sur les qualifications (Céreq) (1970), the All Union Institute for Technical and Vocational Education of the USSR in Leningrad (1963) and the establishment of the Center for Research and Leadership in Vocational and Technical Education (↑NCRVE) (1965) in the ↑United States, which was later (1977) promoted to the status of a National Research Center. On the international level one must above all mention the ↑UNESCO International Center for Technical and Vocational Education and Training (UNESCO-UNEVOC) (2000) and the European Centre for the Development of Vocational Training (↑CEDEFOP) (1975). The national and international interest in vocational education and training research is a consequence of the direct connection of vocational education not only with education policy, but also with economic and ↑labour market policy.

Vocational education is considered a key factor for improving or maintaining the competitiveness of enterprises and national economies. For instance, the Modernization Forum in the United States emphasises in its study "Skills for Industrial Modernization" (1993):

> "As the pace of economic and technological trade accelerates, the abilities of workers and enterprises to learn and adapt becomes a core element in the global competition among corporations and national economies" (Modernization-Forum 1993, 4).

Public vocational education and training research is therefore as a rule closely linked to the mission of ↑VET planning and embedded into the VET dialogue between industry associations, trade unions and the governmental departments responsible for vocational education and training (→2.0). The differences regarding the role of the scientific VET discourse and its proximity to the overall national system of educational institutions depend on the extent to which vocational education is integrated into the educational systems in question.

In countries where a relatively broad university education of ↑vocational schoolteachers is mandatory, the corresponding pedagogical study programmes, which are differentiated into ↑vocational disciplines, constitute a research infrastructure that allows for a professional design of vocational education, learning and teaching processes. The ↑internationalisation of technological and economic development and the emergence of transnational (skilled) labour markets – e. g. in the European Union – have intensified the convergence in vocational education (cf. Grollmann/Spöttl/Rauner 2006) and given considerable impulses to the internationalisation of TVET research. The establishment of the United TVET Network on Innovation and Professional Development (UNIP) is a manifestation of this development.

The variety of ↑research questions and ↑development tasks at the levels of vocational education and training systems (macro level), the organisation and design of vocational training programmes and institutions (meso level) and the analysis and shaping of education and learning processes (micro level) leads to the integration of different scientific disciplines and ↑research traditions. TVET research therefore can be organised only in an ↑interdisciplinary way, notably through the ↑participation of disciplines like psychology, industrial sociology, sociology of work, sociology of education, organisation theory, natural sciences, engineering, pedagogy and economics. Didactical and domain-specific competences are especially brought in by vocational pedagogues as the latter normally have a qualification in a vocational discipline and its didactics (→3.2).

Although the call for ↑interdisciplinarity in the study of complex ↑research fields and topics is repeatedly stressed from a scientific and political perspective, the practical realisation of ↑interdisciplinarity turns out to be difficult. However, it is constitutive for TVET research to treat its research subject as an original one and to provide a sub-

ject-adequate foundation of the ↑research methods (→5.1). The founders of TVET research already formulated this claim in their call for the development of a ↑methodology for TVET research. For instance, the first ↑research programme of the BBF included the

"development of methodological and terminological instruments for the activities of the instruments, taking into consideration the interdisciplinary relationships" (BBF 1971b, 6 [translated from German]).

Since the beginning of the 1970s the practice of TVET research has taken shape and increasingly been organised as an international scientific community. The European research network Vocational Education and ↑Training Research Network (VETNET), which was established in 1997, as well as the international network of ↑UNESCO-UNEVOC centres are an expression of this ↑development. However, the realisation of the claim to clarify the methodological foundations of TVET research fell short of the of the objectives set by the founders of the state institutes for TVET research. The present handbook wishes, among other things, to make a contribution to filling this gap (→5; →5.1).

The roots of the internationally established TVET research date back to the Swedish reform pedagogy at the end of the 19th century, which succeeded in presenting the topic "education for the world of work" through its "pedagogical Slöj" at the five successive world fairs between 1876 and 1904. The achievements of these vocational pedagogical traditions were even awarded a gold medal at the world fair in Paris (Reincke 1995, 7). An international community of vocational pedagogues from the Scandinavian countries, the ↑United States, Russia and Europe treated this pedagogy at the interface between school and the world of work not only as a topic of educational practice, but introduced it also into the education of teachers and thus made it a topic of scientific discourse (Hodson 1901; Larsson 1899). With regard to the development of TVET research in Germany Lipsmeier emphasises the scientification of the reflection, analysis and implementation of vocational education in the context of the activities of the German Committee for Technical Schooling (Deutscher Ausschuss für technisches Schulwesen, DATSCH) established in 1908 and the German Institute for Technical Work Instruction (Deutsches Institut für Technische Arbeitsschulung, DINTA) founded by large-scale industry (Lipsmeier 2005, 22). Already around the year 1900 an internationally comparative branch of ↑educational research emerged, in which vocational pedagogues also participated. The centre of this comparative research was the "International Institute for Teacher Colleges" at Columbia University in New York where pedagogues like Dewey, Kandel, Monroe and Kerschensteiner met (Lauterbach 2003b, 220 ff.).

The works of David Snedden in the early 20th century on the development of ↑vocational curricula had a far-reaching impact. His concept of "Real Vocational Education" laid the foundations of VET didactical research in the ↑USA (cf. also Drost 1967; Snedden 1912; Kliebard 1999). This was accompanied by a fundamental debate on the function of vocational education, which continues to shape the vocational pedagogical discussion and TVET research to this day. The reduction of vocational education to the dimension of qualification according to the demands of the employment system was expressed by the curriculum approach by Bobbitt (1918). This approach viewed vocational education for the industrial development in the USA as a process that had to be organised according to the rules of scientific management as formulated especially by Taylor (cf. Taylor 1911). In contrast to this, John Dewey represented a theory of ↑vocational pedagogy that situated vocational education in the context of democratic education (Dewey 1916b).

It was already at the beginning of the 20th century that tasks like the development of ↑occupational profiles, the definition of ↑specific domains and skills for skilled workers and the development of procedures to measure a candidate's suitability for a specific vocational training course were covered by TVET research. This feature links TVET research to pedagogy as an action-guiding discipline as well as to labour studies as a discipline that aims at the analysis and shaping of work (Emery 1959; Hackman/Oldham 1976; Ulich 1994). In TVET research the development of occupations and occupational profiles, of vocational curricula and training media as well as training methods

are among the central research and development fields. ↑Curriculum research and ↑media research are therefore organised as a combination of analytic and developmental research.

TVET research is distinguished from ↑educational research especially by the *contents and objectives* of vocational education as they developed historically along with the occupation-based organisation of work. This includes the development of occupations and domains, the change of professional work and the analysis and design of vocational education, qualification and learning processes. The vocational domains and their changes therefore become a reference point for the foundation of contents and objectives of vocational education, which also entails the allocation of entitlements for the employment system. Whereas the *Abitur* certifies the qualification for university studies, the conferment of entitlements at the end of vocational training often refers to quite specific competences that enable the candidate to fulfil professional tasks. Only the successful examination as a pilot leads to the licence to fly an aircraft. If the trained pilot cannot demonstrate in the final examination that he can transform the information displayed by the artificial horizon into the correct and situatively adequate operation of the aircraft in terms of elevators, yaw rudder and speed, he will be denied access to the ↑profession of a pilot. This is a particularity of all forms of vocational education, which aims at the acquisition of professional competence for the exercise of specific occupations. With regard to the scientific study of vocational learning this situation leads to particular challenges, e. g. concerning the ↑decoding of the knowledge and skills incorporated in the practice of professional work or the assessment and evaluation of professional competences.

The term "vocational education" denotes the appropriation of the entire range of skills that are acquired within and for the employment system. Qualification, competence and education are therefore key categories that are presented in the different chapters of this handbook. This means that the relationships between socialisation and education, general and vocational education as well as ↑vocational guidance and initial and continuing training are also treated as topics of their own. It is for purely practical reasons that in the present handbook TVET research is confined, following the ↑legislation on vocational education and training, to societal work in the employment system to the extent that the relevant training does not take place in higher education.

Unlike the system of general education, vocational education and training is characterised by the crucial importance of *learning in the ↑work process* (→ 3.6) as a dimension of intentional and informal competence development.

TVET research also differs from (general) educational research because its focus is on the vocational learning of adults, which means that the theories of learning, cognition and development that are important for the analysis and design of education and socialisation processes of children are only marginally relevant for TVET research. What is important instead are development theories that can particularly be applied to the learning of adults (cf. Havighurst 1972; Erikson 1966; Dreyfus/Dreyfus 1987; Lave/Wenger 1991).

Another particularity of vocational education is the fact that countries with comparable levels of economic development brought about highly different systems of vocational education and training. Vocational education is to a large extent shaped by the cultural particulars of the nation-states. Highly developed TVET systems with long-standing traditions, e. g. in the European countries, are competing under the conditions of economic and technological ↑internationalisation with industrial cultures where occupational work and the related type of education have only little relevance. This applies e. g. to ↑Japan (Georg/Sattel 1992), where accordingly no advanced TVET research has emerged. The situation is completely different in the ↑United States, where there is a greater openness in higher education towards real life and practical contents. This has led to the establishment of vocational programmes at universities. Nurses, whose education e. g. in Germany takes place at technical colleges, study subjects like "nursing" in long-established faculties at American universities. As a consequence of a distinct tradition of ↑vocational study programmes the ↑vocational disciplines and ↑research traditions in the domains of the personal service sector de-

veloped earlier in the United States than in countries with a clear demarcation of vocational and higher education (vocational guidance; ↑vocational preparation).
Similar differences in the international context are caused by the different modes of the transition from school to work with regard to the first as well as the second threshold (Stern/Wagner 1999). The investigation of transition problems at the first threshold of the ↑school-to-work transition and the ↑performance of literacy studies on the basic competences of reading and writing as well as on elementary skills in mathematics and natural sciences have considerably grown in importance. This aspect will be treated in the topics maturity for training, ↑vocational preparation and ↑vocational guidance.

TVET Research – an Interdisciplinary Research Field

There is a particular affinity with regard to content and methodology between TVET research and labour studies. The difference lies in the ↑domain-specific diversification of TVET research. Whilst labour studies, e. g. in the analysis and shaping of skilled work, is above all interested in the aspects of workload, health protection and work safety, TVET research is primarily focusing on the *contents* of work and training and also on the further development of ↑occupational profiles and ↑vocational curricula. The affinities and commonalities as well as the differences between the two ↑research traditions have been pointed out in manifold ways (→ 3.8.1).
Research in labour studies gave important impulses for the field of "work and technology" research. This term points at a programme of technology and work policy that emerged from the policy of work safety and "humanisation of work" (→ 3.8.1). The "humanisation of work" programme includes the aspects of qualification along the ↑work process as well as the analysis and shaping of workplaces, work contents and work processes with regard to qualification (→ 3.8.1). The piloting of qualification-adequate work processes is a distinguished task of the "humanisation of work" and afterwards of "work and technology" research. In the early 1980s the critique of the reactive practice of estimating and mitigating risks that technological innovations (might) entail for the world of work led to the initiative towards a "work and technology" research to emphasise the aspect of shaping (Rauner 1988a). The technological and economic determinism prevalent at that time in industrial sociology, sociology of work and ↑qualification research was critically reflected upon (Lutz 1988). Donald MacKenzie and Judy Wajcman termed technological determinism "the single most influential theory of the relationship between technology and society" (MacKenzie/Wajcman 1985, 4). For TVET research, which in Germany participated in the promotion of a "work and technology" research and development programme via the BIBB, this entailed the consequence of taking the fundamental shift of perspective to the "shaping" paradigm into consideration in the course of its research and development activities. Since then vocational education and qualification is no longer interpreted as a mere dependent variable resulting from the demands of technological and economic change – as qualification *requirement* – but as a relatively independent variable in the interplay of technological innovation, the change of work contents and forms as well as the qualification of workers (→ 3.8.1). The analysis of the interrelationship between work, technology and education at the levels of learning and training processes, training programmes and educational systems led to the rejection of a type of TVET research that interpreted vocational education, following the tradition of technological and economic determinism, as adaptation to the changes in the world of work.
This leads to a variety of linkages between scientific disciplines and research traditions that are occupied with these interrelationships. If one puts ↑vocational pedagogy and ↑vocational disciplines (→ 3.2) in the centre of TVET research one can distinguish five ↑interdisciplinary fields.
Occupation research as a central field of TVET research requires the cooperation of experts from vocational pedagogy, vocational disciplines and industrial sociology. The exclusive allocation of occupation research to only one of these disciplines would be accompanied by a narrowing of ↑research questions. The same is true of the close

cooperation between occupation research and ↑labour market research. The occupational form of work is perceived under this perspective as an aspect of the employment system and the markets for skilled labour (Kurtz 2005; →3.1.1).

When the analysis and shaping of professional ↑work processes are also viewed under the aspects of occupational socialisation (→3.6.6), development of ↑professional identity (→3.6.8; →3.6.9), professional competence development (→3.5.1; →3.6.7) and VET didactics (→3.6), it becomes clear that occupation research is a central topic of TVET research.

Occupation research and ↑*qualification research* (→3.4.1) are closely linked fields of TVET research since the development of occupations is associated with the foundation and description of ↑occupational profiles and their characteristic ↑work tasks and qualification requirements, which have to be studied in this context. Qualification research, which is diversified according to occupations and occupational domains, requires the cooperation of the relevant ↑vocational disciplines (→3.2). The latter typically build on the methods of curriculum and expertise research.

↑*Curriculum research* is in turn closely connected to qualification research. The core question of curriculum research is the legitimation of educational contents and objectives in vocational education as well as the systematisation of these contents and objectives in ↑vocational curricula and training programmes. To this day subject-related theories and concepts derived from developmental theory compete with such theories and development concepts that justify training contents by making reference to the objective features of scientific knowledge or to actual qualification requirements (→3.7.1). A particularity of curriculum research and development in vocational education and training is the systematisation of professional competence development as learning in the work process.

The fact that skilled work is differentiated into occupations and the associated variety of technical and vocational education and training renders the establishment of a *learning and teaching research* organised according to occupations and domains quite difficult. Unlike general ↑educational research, which is in this regard above all concerned with ↑teaching and learning processes in reading, mathematics and elementary natural sciences as a part of ↑literacy research, TVET research has to distinguish between hundreds of different occupations. The existing research shows that this puts particularly high demands on ↑interdisciplinarity and ↑research cooperation. The characteristic learning in the work process, the organisation and shaping of learning-supportive work environments up to the design of the human-machine interaction also require the integration of expertise from labour studies and engineering.

Research Methods

It is hardly surprising that a research that is oriented towards ↑interdisciplinarity is drawing, via the agents in the scientific process, on the methodology of various disciplines. The researchers use their specific methods according to their disciplinary background and constitute their research subject as a topic of sociology, labour studies, economics, engineering or natural sciences. Qualification research in the social sciences is an example for this (→3.1.5; →4.5). In ↑domain-specific qualification and competence research the crucial point is to view the *social* and *cultural rules* that shape professional agency together with *objective rules*, the validity of which, e. g. in skilled work in technical and mechanical trades, can be explained only on the basis of natural sciences and technology. The insight that professional agency and professional competence are characterised by the mastery of social *and* objective rules (cf. Röben 2004a; Müller 1978; Heritage 1984, 295 ff.) has far-reaching consequences for the methodological orientation of TVET research:

"The mastery of the interplay of objective and social rules in the competence for professional agency necessitates a transdisciplinary research approach" (Röben 2004a, 20 [translated from German]).

To this day TVET research is characterised, besides the recourse to the methods of empirical social research, by a pluralism of methods that build on everyday situations and which are applied above all according to criteria of practical plausibility. This practice is more common in the most heterogeneous ↑research traditions than usually

assumed, for an explicit consideration of the practical methods only rarely takes place. An exception to this rule is Gerhard Kleining. Besides the methods of natural and cultural sciences or ↑humanities he emphasised the methods of mastering everyday life as the ones "that so far have enabled the survival of mankind" (Kleining 1995c, 12 [translated from German]). He summarises his methodological reflections on the relationship of everyday methods and scientific methods in the thesis:

"Everyday methods are the basis of scientific methods. Qualitative and quantitative methods are everyday methods abstracted in different ways" (Kleining 1995c, 14 [translated from German]).

If this thesis is accepted it is a logical step to present, after a period of diversification in TVET research and on the basis of a methodological debate and development in the past 15 years, a handbook in which TVET research is documented as a combination of ↑research fields with mutual references among each other and with its variety of concepts, strategies and methods that are increasingly developed and adapted with a view to the research topics.

The challenges for TVET research have increased with the acceleration of technological and economic change. Another challenge is the shaping of the relationship between ↑internationalisation and ↑localisation in the qualification of workers, which is the crucial factor for innovation and prosperity in the international quality competition. With regard to the highly diverse tasks of TVET research between the orientation towards the foundations of vocational education, the shaping of the latter in ↑pilot projects or the monitoring of international ↑TVET cooperation, this handbook aims to be more than just a reference work for guidance and lexical knowledge on TVET research. The handbook is also intended as a tool that makes it possible to distinguish TVET research with all its domains in the competition with other research disciplines.

Structure of the Handbook

The present handbook follows the structure of the German edition. The organisation of the chapters is based on the structure of TVET research as developed there. It had to be taken into consideration that some topics that refer to the organisation and shaping of national TVET traditions cannot always be presented by means of comprehensive articles. In these cases we use the form of national case studies. For instance, the topic of ↑vocational guidance is presented by means of case studies from Germany, ↑Japan, the Netherlands and the United Kingdom. The agreement with the publisher to take care of the internationalisation of the German edition could largely be fulfilled by means of the integration of additional chapters and the cooperation with additional authors. Nevertheless the handbook remains a work in which the practice of TVET research as it has emerged in Germany on the basis of an innovative system of vocational training and the education of TVET teachers at the master's level plays an important part also for the English version.

The first sections of the handbook present the *genesis of TVET research* as well as overviews of its ↑research questions concerning ↑vocational pedagogy and the various ↑vocational disciplines. Moreover, TVET research is presented as a field of international and comparative research.

Compared to research on general education, TVET research is more intensively embedded in tensions that emerge from the interests of the stakeholders in vocational education as well as from the interaction between ↑TVET policy, ↑TVET planning and TVET practice. The second section of the handbook therefore features chapters that particularly deal with the societal framework conditions in the national and international context. Unlike general and higher education, vocational education regards education also as a dimension of corporate ↑organisational development and thus as a human resource. In politics the economic and labour market dimensions of vocational education are no less important than the dimension of ↑educational policy. The research questions resulting from this situation are treated in the chapters of the second section.

A focal point of the handbook is constituted by the section on *fields of TVET research* with its eight sub-sections. The reception of the handbook in practice will show whether there is a need for further differentiation and supplementation. Various

suggestions of the co-authors led to additions and improvements already in this first edition.

For example, an additional chapter 3.5 on "Cost, Benefit and ↑Financing of VET" was included. This chapter features contributions on TVET economics. These range from the presentation and discussion of methods for the measurement of costs and benefits of vocational education to issues of the ↑wider benefits of learning.

The central research and ↑development task of ↑*curriculum development* is presented in six chapters, which describe the ↑research field from occupation research, embedded into ↑labour market research, to specific forms of the study of occupations in sociology, pedagogy and the ↑vocational disciplines.

Research in the vocational disciplines is of crucial importance in TVET research, for it is here that the contents and forms of vocational education are scrutinised on the basis of concrete occupations and occupational domains. The vocational disciplines, which are differentiated according to domains, face the difficulty that neither occupations nor occupational domains are categorised according to a generally accepted international classification system (→ 2.3). It is true that in the international practice of vocational education between six and 15 vocational ↑subject areas like health care, construction industry, agriculture, manufacturing or business administration have emerged. But the different traditions of the occupation-based organisation of work and the related vocational education lead to considerable limitations concerning the international comparability of research findings in this field. This applies also to the corresponding vocational disciplines. In the present handbook eight areas of research in the vocational disciplines are treated, which does not fully cover the range of vocational disciplines. For pragmatic considerations the subjects agriculture, ↑nutrition and housekeeping were put together. This is justified to some extent by the structure of the value-added chain.

The research field ↑*TVET planning and development* represents an area that also contributed to the decision to recognise TVET research in the legislation on vocational education and to establish it in the form of state institutes. The topics considered in this section directly relate to TVET planning and to qualification and curriculum research. Other topics rather point to the corresponding basic research like competence and expertise research.

The research field VET didactics includes chapters that discuss questions of general VET didactics. The ↑domain-specific issues of didactical research are assigned to research in the vocational disciplines (→ 3.2).

The research field *work* and *technology* views work, technology and education as mutually linked cornerstones of a shaping-oriented research field that has its origins in the "humanisation of work" research. The topics treated here deal with the different forms of workers' ↑participation in the processes of shaping the world of work. This includes the question of the qualification for participation and co-shaping. In this research field ↑interdisciplinary references to research in labour studies become visible in particular.

Inspired by the Handbook of Qualitative Social Research (Flick 1995a) and the review of the proposal for the present book a particular section with *research examples* was included, which allows for an illustration of TVET research and its genesis. The selection of these chapters was less based on representativity, but rather on originality and innovations in TVET research. Vocational education and ↑training research is in a situation in which the research projects that may have an undisputed model character have yet to be identified. By means of the exemplary research projects the breadth and variety of TVET research and its epistemic and innovative potential for the scientific process as well as for educational practice will be documented. The chapters also represent quite different methodological approaches. In all of them the genesis, the epistemic interest and in some cases also the innovative interest are discussed. The originality of the research concepts is emphasised so that the scientific and practical relevance of the selected examples for the development of TVET research becomes clear.

In the final section the *methods of TVET research* are reflected. In addition methods are presented that have a particular affinity to the topics of TVET research. The reason for limiting this section to a narrow scope of research and develop-

ment methods is in order to explain and illustrate the relationship between research subjects and methods by means of selected examples. Above all the chapters in this section will stimulate a more detailed reflection of the problems of the choice of methods and their adaptation to the research subject, and they will encourage the development and testing of new methods of TVET research. Various ↑research methods that have no specific connection with TVET research are treated in a multitude of publications, especially from the fields of expertise and competence research, which were not included in this handbook

Section 1
Genesis of TVET Research

Uwe Lauterbach

1.0 Introduction: Genesis of TVET Research

Uwe Lauterbach

1.0.1 The Research Field of TVET Research

An overview of the worldwide historical development of technical and vocational education and ↑training research (TVET research) is difficult to write. The definition of the ↑research field of TVET research has always been determined by national definitions and structures, which in turn are shaped by cultural traditions. A course of study that counts as vocational education in one country may be a part of higher education in another, and it may be entirely absent in a third country because the professional domains and hierarchies are organised differently. Suffice it to mention the example of technicians, whose education is not only structured differently, but also takes place in different parts of the educational system in England (college, university), Germany (higher secondary level or non-university ↑tertiary level), ↑France (higher secondary level, lycée d'enseignement général et/ou technologique) and the ↑USA (↑community college).

An examination of the classification system ISCED (International Standard ↑Classification of Education) for educational programmes (see the following section), which is used by the ↑UNESCO and the ↑OECD for reporting on national education systems, makes this differentiation easily visible (OECD 1999a; 2004c, UNESCO 2007). In order to allow for an overview of national developments and to display worldwide trends the national fields of TVET in 176 states are listed and compared in the ↑UNESCO ↑statistics (Ellis 2004). This task reveals the variety and systemic differentiation of TVET already by the classification between ISCED 2 and 3 (lower and higher secondary level), ISCED 4 (post secondary non-tertiary) and ISCED 5b (higher education). These educational tracks are highly different in their objectives and most likely are not present in any one country at once. Whilst ISCED 2 is focusing on literacy and basic vocational training and concerns above all children and youth, study programmes at the ISCED 5b level, which are mostly taken up by adults as ↑continuing education, presuppose a very good secondary education and practical experience at a complex level. This intricate variety of national TVET systems entails consequences for TVET research, for it has to be oriented first towards the national situation and thus a determined research field with associated ↑research questions. Whereas the structural differentiations between countries are perceived in most cases, those demarcations of the research field that are related to cultural contexts are more difficult for TVET research between single national systems. It is enough to mention the semantic differences of the term TVET in the various languages. In the German-speaking area *berufliche Bildung* is used as a comprehensive term and denotes everything that relates, regardless of the ↑learning venue, to the imparting (including informal self-learning) of skills and knowledge directed towards the exercise of a professional activity that is mostly defined by a recognised occupation. In the Anglo-Saxon cultural sphere, on the other hand, a more subtle differentiation takes place. This refers to the occupation, which may be classified, according to educational level (e. g. on-the-job training, secondary education, higher education) or social standing as *occupation,* ↑*vocation* or ↑*profession*. How difficult the definition of the research field can be already in one and the same language is shown by the different terminologies used by the UNESCO (technical and vocational education and training, TVET) and the EU (vocational education and training, VET). If these terms are translated back into other languages, problems of delimitation may be the consequence. This is, for instance, the case in France where there is a distinction between *formation professionnelle* and *formation technique*. Besides, this distinction of technical and vocational education also applies to the English-speaking countries.

In the globalised world of today the national TVET systems are directly influenced by transnational developments. This is why the demand for international research and for the exchange of national research findings is increasing. How did the ↑UNESCO as the ↑UN's educational organisa-

tion with its worldwide activities respond to this challenge? At the 1974 General Conference of the ↑UNESCO the field of political activities was described as follows: (a) an integral part of general education; (b) a means of preparation for an ↑occupational field; (c) an aspect of ↑continuing education (Lehmann 1988, 55). The ideological root of this definition was the conviction that vocational education is one way among many others to prepare for professional work. In comparison to general education, TVET was assigned less relevance. Thus the ↑research field was narrowly defined. In the meantime this position has undergone a profound change.

"These statements represent a broadening of TVET from the narrow task of providing training for industry- and occupation-specific skills to the broader task of workforce development and ↑lifelong learning for sustainable development and citizenship" (UNESCO-UNEVOC/BMBF 2004, 4).

The field of TVET is not only broadened and situated in the social and economic contexts, but at the same time a reform of national TVET systems in the light of the new conception and challenges is called for.

"[T]here is an urgent need to renew TVET. This should be the top priority for every country … This is a task that can only be accomplished if a country can succeed in articulating TVET with its system of education within a framework of an overall sustainable development strategy" (UNESCO-UNEVOC/BMBF 2004, 4).

This broad definition of TVET and its future tasks, which are specified in detail in the results of the Second International Congress on Technical and Vocational Education (Seoul, Korea, 1999), outlines today's worldwide research field of TVET.

1.0.2 International Standard Classification of Education (ISCED 1997b)

The well-known fact that the national systems of education and training are very different prompted researchers from universities and research institutes in the 1950s to initiate a discussion on the standards that have to be applied in the international comparison of educational systems. Their aim was the further conceptual and methodological development of international comparison in order to generate internationally comparable data and results (Robinsohn 1992, 7 ff.). As a consequence of these stimuli the ISCED classification was developed as a standardised description of national educational programmes (Porras-Zúñiga 1994, 959 f.). The ISCED system was first used in the 1970s for the compilation of worldwide ↑statistics on education. In 1975 it was approved at the International Conference on Education in Geneva, a regular conference of national governments within the framework of the *International Bureau of Education* (IBE) (http://www.ibe.unesco.org/), and at the 1978 conference in Paris it was adapted with a view to the standardisation of pedagogical statistics. Further adaptations were necessary over time, above all for the increasing variety of educational opportunities. The current ISCED classification was approved by the UNESCO in 1997.

In order to allow for international comparability of databases and classification systems within the INES (Indicators of Education Systems) framework (http://nces.ed.gov/surveys/international/INES/), today the UNESCO, EUROSTAT for the European Union (for the ISCED classification of European qualifications and degrees see Eurydice 2004) and the ↑OECD cooperate under the coordination of the OECD. The ISCED-97 system, which was published in 1997 by the UNESCO department of educational statistics, has been adapted and updated in the meantime by the OECD. Under the title *Classifying Educational Programmes: Manual for ISCED-97 – Implementation in OECD-Countries* it was published in several updated editions (OECD 2004c;). The OECD publishes detailed manuals for the classification of national educational degrees (OECD 2004c). These overviews allow for the internationally comparable categorisation of national educational programmes. For the industrialised countries that are members of the OECD, this educational reporting with indicators (Education at a Glance) takes place in great detail.

The following description summarises the classification system ISCED 1997. The description is based on the original document of the UNESCO: International Standard ↑Classification of Education ISCED 1997 (UNESCO 1997b).

Pre-Primary Education (ISCED Level 0)

Level 0 comprises the age levels from 3–5 to 5–7 years. This elementary education includes all forms of organised and permanently institutionalised activities to support the willingness to learn and the emotional and social development of children. The term "institutionalised" draws a distinction between activities of institutionalised bodies (elementary school, pre-primary school, kindergarten, nursery) and activities that take place in private households and families. The typical entry age is three years.

Primary Education or First Stage of Basic Education (ISCED Level 1)

Primary education starts at the age of five, six or seven years and lasts four to six years (↑OECD average: six years). Educational programmes at the primary level normally do not require any prior formal education. In those countries where basic schooling comprises the entire period of ↑compulsory schooling – where there is, in other words, no division into primary and lower secondary level – the primary level is considered, for the purpose of statistical classification, to be completed after six years.

Lower Secondary Education/Secondary Education First Stage or Second Stage of Basic Education (ISCED Level 2)

Level 2 features a system of specialised teachers (specialists for each subject) and lasts until the end of compulsory schooling. The educational contents are expected to be designed in such a way as to complete the basic education that started at Level 1. In this domain the ↑basic skills are applied and optimised. It is frequently at the end of lower secondary education that compulsory schooling, where this practice is in use, also comes to an end. In countries where the primary level is also part of a common basic education the second level of the latter should be assigned to ISCED Level 2. In cases where that basic education is not officially divided into levels the period after the sixth year (i.e. the seventh grade onwards) should be classified as ISCED Level 2. This level also includes specialised educational programmes for people with disabilities and all types of ↑adult education that are similar to education at ISCED Level 2 in terms of content.

Secondary Education Second Stage/Upper Secondary Education (ISCED Level 3)

Upper secondary education serves general or vocational education. A degree indicates the qualification for work in a particular vocational domain and/or for admission to a higher school. The age level roughly ranges from 15–16 to 18–20 years. It normally includes two to five school years. The admission requirement is usually the completion of Level 2 or a combination of basic schooling and professional work experience.
Secondary education second stage can be preparatory
– for the first phase of the ↑tertiary level ISCED 5a (university education) via ISCED 3a (like ↑High School Diploma, Baccalauréat, Abitur, Matura etc.) and
– for the first phase of the tertiary level ISCED 5b (practice-oriented tertiary education, e. g. study programmes for technicians) via ISCED 3b (e. g. apprenticeship training in the ↑Dual System)
or closing, i.e. serve the preparation for the direct enty into work via ISCED 3c.
In upper secondary education a greater specialisation than at ISCED Level 2 can be observed. Very often teachers have to be better qualified and more specialised than at Level 2. The entry age for this level is usually 15 or 16 years. To be qualified for admission to educational programmes at Level 3, a person must have completed a full-time education of approximately nine years (starting from the beginning of ISCED Level 1) or acquired education in combination with professional experience. The completion of ISCED Level 2 or proof of the ability to master educational programmes at this level are considered minimum requirements.
ISCED Level 3 also includes specialised education for people with disabilities and adult education. Excluded from ISCED Level 3 are supportive measures for participants in Level 2 programmes who did not achieve the learning objectives of these programmes. These measures are not equivalent to the programmes at ISCED Level 3 that were de-

scribed above. They have to be assigned, depending on their content, to ISCED Level 1 or 2.

Post-Secondary Non-Tertiary Education (ISCED Level 4)

Level 4 is a transitional stage between the upper secondary level and ↑tertiary education, even if from a national point of view a clear allocation of programmes to Level 3 or Level 5 might be possible. ISCED Level 4 programmes cannot be viewed as tertiary programmes as regards their content. Very often they are not located considerably above the level of ISCED Level 3 programmes. However, they offer the possibility to extend the knowledge of those who have completed Level 3. Usually participants are older than those at Level 3. There is no age limit. Programmes may last from half a year to three years. There is a distiction between ISCED 4a programmes, which prepare for ISCED Level 5a or are an entry requirement for that level, and ISCED 4b programmes, which do not give access to ISCED Level 5, but serve above all to prepare for entry into the ↑labour market,

First Stage of Tertiary Education (not leading directly to an advanced research qualification) (ISCED Level 5)

ISCED Level 5 programmes are more sophisticated than programmes of upper secondary education (Level 3) or programmes of post-secondary non-tertiary education (Level 4). Admission requirements are typically the successful completion of Level 3a or 3b, or comparable qualifications at Level 4a. Level 5 programmes have a minimum duration of two years. They do not lead directly to a doctorate or a comparable advanced research qualification (ISCED Level 6).

ISCED Level 5a

Higher education lasts three to five years. Level 5a is in most cases completed by the acquirement of a degree (Bachelor, Master, Engineer) at a university of applied sciences or a university. This level includes all research-oriented study programmes that are not part of a doctoral programme. The content of these programmes has a stronger theoretical and scientific orientation than the programmes at Levels 3 and 4. Admission to this level requires the successful completion of Level 3a or 3b or a similar qualification from Level 4a. All university degrees are classified at the tertiary level in a comparative perspective in terms of type of programme, position within the national structure of degrees or qualifications, and overall duration. Included are consecutive study programmes like the American Master's degree. The entire period of study must be at least three years (full-time equivalent).

ISCED Level 5b

Qualifications at ISCED Level 5b typically entail shorter periods of study than those at Level 5a. They are vocationally oriented, focus on practical work and are directed towards immediate entry into the labour market. Nevertheless there is some theoretical foundation. The degree awarded is relevant for the labour market. Direct access to the ↑research programmes at ISCED Level 6 is not possible. Admission requirements for Level 5b are the completion of ISCED Level 3b or 4a in a specific discipline in combination with a vocational qualification.

Second Stage of Tertiary Education (leading directly to an advanced research qualification) (ISCED Level 6)

This level is reserved for post-graduate studies tha directly lead to an advanced research qualification like the Ph.D. These programmes therefore focus on further studies and original research and not just on the attendance at advanced courses.

1.0.3 Determination of Consistency and Continuity of TVET Research through the Development of National TVET Systems

The national development paths of TVET systems are embedded into the respective historical processes. The field of TVET research relates to the relevant domains of the TVET systems in question. In the course of historical development the ↑research field is continuously extended. The period covered may be only three decades (as in ↑Aus-

tralia) or last more than a century (as in Germany and the ↑USA).

In Germany Georg Kerschensteiner already in 1901 presented a ↑comparative study of the TVET systems of Bavaria's neighbour states in order to collect information for the further development of the technical ↑school system in Munich (Kerschensteiner 1901a). This way he established a (comparative) research whose major epistemic interest was the development of the domestic system on the basis of understanding "alien" TVET systems as an important department of TVET research. In the ↑USA the scientific investigation of TVET also started at the turn form the 19th to the 20th century when the first schools and departments of education, whose primary mission was the education of teachers, were established at colleges and universities.

On the other hand the example of ↑France shows that the "disesteem" of TVET, together with the dominant supply of qualifications for the ↑labour market through the system of general education (including university education, naturally led to the consequence that an autonomous TVET system and the corresponding research activities did not develop as fully as was observed in Germany and the Netherlands.

In all studies included here the monitoring and support of the development of the national TVET system is identified as the major reason for the genesis of TVET research. What is crucial for the positive reception by policy-makers and thus for the promotion of the continuity of this constellation is the expected positive contributions of a developed TVET system for the economic development and for the welfare of a country. Moreover, the integrative capacity of the TVET system with regard to socially ↑disadvantaged and marginalised groups is emphasised.

The systematic and comparative view across national boundaries, i.e. *comparative* TVET research, on the other hand, is chosen as a focal point only in the studies on ↑China, Germany, France and ↑Japan. Comparative TVET research is distinct from *international* TVET research in that the latter in most cases only accidentally extends beyond the national boundaries and in that the systematic comparison is not given priority.

A further aspect of the founding periods in Germany and the USA is typical of the worldwide tradition of TVET research. The early researchers were neither TVET researchers nor vocational pedagogues. They were educational researchers in a wider sense and, in terms of scientific discipline, predominantly "pure" social scientists (psychologists, sociologists, political scientists) or pedagogues and philosophers, like John Dewey and Georg Kerschensteiner.

Germany has a special position in the development of TVET research because since the academic drift (relating to the education at universities) of the teacher education for the TVET system a recruitment of graduates for academic careers and thus for careers in TVET research has become usual. This situation led to the effect that in Germany, unlike most other countries, a scientific discipline of its own called "↑vocational pedagogy" could emerge, which in the beginning was present only in those places where TVET teachers were educated at universities (Lipsmeier 1972). In the USA the research in TVET also has a long tradition, but in the context of teacher education in general and thus in the context of *research in education*. TVET research in the USA can be traced back to the second half of the 19th century. Since then it has remained vital especially with the help of federal funding programmes and less in virtue of the results of an independent research discipline.

This situation, which is quite common, also leads to the consequence that there is a lack of qualified young researchers in TVET research. In ↑Australia this situation is currently being reviewed critically and support for researchers is advocated as it can be predicted that the present generation is "greying" and that young researchers in ↑educational research rather specalise in one field and are less inclined towards the multidisciplinary domain of TVET research, which involves many societal spheres.

Is it possible to overcome these problems by constituting an independent scientific discipline *TVET research* on the basis of a monolithic paradigm and a homogeneous methodological concept? The establishment of TVET research as a 'monopolist' in the domain of TVET can be justified neither from

the perspective of the philosophy of science nor by considerations of research practice. Other social sciences and ↑humanities like sociology, psychology, economics, law or philosophy, but also natural sciences and engineering have just as well a research interest in TVET and its contexts in culture, society, economy and technology. Their self-concepts will continue to be defined via ↑research objects and the epistemic interest. What is crucial for the attribution of a research object to TVET research is the pedagogical research interest as it is explained in the definition of TVET research (see the following section) that is used here. In that sense pedagogical TVET research has a guiding function, for it is this pedagogical approach that integrates and concentrates the divergent interests of researchers from a multitude of different disciplines.

1.0.4 TVET Research as Multi- and Interdisciplinary Research: Epistemic Interest, Research Fields and Research Methods

Research in TVET has a multi- or ↑interdisciplinary structure and extends beyond the original core, systems research, which mostly accompanies the development of national TVET systems and works out a philosophical classification and justification of vocational education, as well as beyond methodological teaching research (teaching and learning research), which is important for the professional work of teachers at ↑vocational schools.

TVET research nowadays is concerned with phenomena of education and training that are directly or indirectly related to occupations, to the acquisition of (vocational) qualifications, and to (professional) work activities. It investigates the conditions, processes and consequences of the acquisition of these professional and general qualifications in the context of cultural, social, political, historical and economic conditions, e. g. personal and social attitudes and orientations that appear relevant for the ↑performance of (professionally) organised ↑work processes in initial and continuing training (including ↑informal learning). The systems of vocational education have to be situated and viewed in the context of the entire education system (Achtenhagen 1999; DFG 1990; Lauterbach 2003b).

This extensive definition of TVET research includes the various national ↑research fields. These in turn are retrospective when they concentrate on the historical development of vocational education, up-to-date when the philosophy of the TVET system in question, its curricular structure or its quality in relation to the current challenges are investigated, or prospective when the contribution of a specific TVET system to the fulfilment of the expected future qualification needs is assessed. It is the societal and economic contexts that deliver the ↑research questions for ↑qualification research, ↑labour market research or ↑transition research (this sub-discipline is concerned with the transition – very often of particular social groups – from general to vocational education and from there to ↑further education or professional work).

TVET research as practice-oriented research supplies the public, the stakeholders involved, TVET planners and administrators as well as policy-makers with categorial interpretation schemes for the ↑structuration of reality. This way TVET research helps to prepare solutions for future reforms. The definition of practical research objectives is closely connected to the controversial question to what extent TVET research actually can make a contribution to the improvement of the TVET system and offer solutions for the planning of practical actions. This functionalist paradigm of "change for the better" has been a constitutive and dominant part of theories from the beginning to this day. It is this very functionalism that demonstrates the close interrelationship between the current research topics and the political circumstances. At present, for instance, the quality of TVET in relation to the national TVET system or the autonomy of training institutions are in focus.

> "The particular […] question raised is: how does the structure of a society, and in particular that of its schools, which can be conceptualized as systems, contribute to the viability of that society, its survival and ↑efficiency: in other words, what link is there between structure and function?" (Halls 1990, 36).

The ↑research design of the studies is based on *fundamental theories and paradigms* that refer to specific concepts in the philosophy of science, e. g. positivism, evolutionary theories, the func-

tion of experiments in social research, induction theory, world systems theory etc. (Lauterbach 2003b, 125 ff.). As TVET research, being an integrative discipline, discusses and adapts theories from the ↑humanities as well as the social sciences, the discourse (regarding theories, methods and research topics) that is present in the corresponding disciplines will sooner or later take place in TVET research, too. Whereas up to the 1980s there were fierce fundamental arguments between different scientific schools, the war of paradigms has since then been replaced more and more by a community of scientists who no longer concentrate on these disputes, but use their research capacities to realise scientific products. Husén summarised with regard to the 'realistic turn' that the single denominations are not capable of answering 'all' questions and that their results are prone to sustain conflicts and to communicate an inadequate world-view (Husén 1988).

As regards the ↑research field of TVET systems, two approaches can be distinguished. In the first one the TVET system is perceived and analysed as a closed social system. The second theoretical model situates the TVET system in the context of social forces. By means of an ↑interdisciplinary ↑research approach the social, political and economic functions that society assigns to the TVET system are examined (cf. Kazamias/Schwartz 1977, 159 ff.).

The practice of research is dominated by projects that follow a pragmatic realism and look into single aspects of the national TVET system without calling the latter into question. These projects are in most cases commissioned by public bodies. The paradigms that define the topics of these research activities develop further or are linked to specific phases. Current research projects – besides the comprehensive approaches of the ↑UNESCO – refer, for instance, to the ↑mobility of citizens in the European Union with regard to ↑labour markets and national TVET systems. Theories determine the ↑research questions, which is exemplified in the EU by the replacement of the theory of convergence of national TVET systems with the theory of transparency of national systems. These theories are in most cases the extracts of research projects that were taken up by politics and led to a change of strategy.

This proximity to society and politics generates different paradigms for the national styles of TVET research. Whilst in ↑Australia a major ↑research problem is more oriented towards the ↑economics of education, like "important questions around the return on investment to enterprises from training", in Germany or ↑France there are, besides many functionalist empirical studies, fundamental research approaches that look into the parity of esteem of TVET in comparison to general education at the systems level or into equality of opportunities (socio-economic status, gender) at the individual level. This also includes research activities that build upon a humanistic instead of a functionalist paradigm. These investigate the societal issue of ↑work process oriented "skilled work", which is supposed to lead to the identification of the skilled worker with his work, under many aspects which are also practically relevant, including the context of the ↑European Qualifications Framework. TVET research in the ↑USA also is not confined to the functionalist research mostly commissioned by the federal government (department of labour, department of education). Research also examines the relationship between society and the TVET system as in the case of a priority programme on the dissemination of vocationalism, which "strengthened the field and helped to make it respected among other educators, business, industry and the general public". In France, fundamental research questions like "socio-professional integration of young adults has developed considerably" are addressed as well. These are standing in the tradition of French sociology of education.

In the context of ↑internationalisation (↑OECD, ↑ILO, UNESCO) and the development of the European Union research questions that relate to these wider geographical and political areas gain relevance besides the national aspects. Here it is not only the research questions, which, as in the EU, start from the mobility principle of the European treaties and cover various aspects like quality, competences, mutual recognition, the European Qualifications Framework etc., but also the financial support of projects that more and more

suggests itself as an alternative to national funding schemes.

In the EU diverse national ↑research traditions and developmental stages of TVET research encounter each other. The European Centre for the Development of Vocational Training (Centre européen pour le developpement de la formation professionnelle, ↑CEDEFOP) in Thessaloniki, Greece (http://www.cedefop.europa.eu/), being the institution of the European Commission that initiates and coordinates "European" TVET research, documents these national traditions in its European Reports on Vocational ↑Training Research in Europe (Tessaring 1998c; Descy/Tessaring 2001; Descy/Tessaring 2005), which are published since 1998. The reports attempt to link these traditions to research aspects that are relevant for the EU and thus promote the establishment of a common basis for a European approach in TVET research. The first report *Training for a changing society* witnesses to the fact that fundamental systemic ↑research questions were the starting point in this context, too. In the meantime special problems are addressed: Training and learning for competence (second report), Evaluation and impact of education and training (third report) and Modernising of vocational education and training (fourth report). Currently the fifth report is being prepared, which will feature a *Foresight study on themes and issues*. Since TVET has gained considerable importance in EU politics in the context of the ↑mobility principle (with regard to the ↑labour market, initial and continuing training, ↑informal learning, ↑lifelong learning etc.) and the objectives of the ↑Lisbon declaration (2000), a multitude of projects in TVET research is directly commissioned by the Commission or by ↑CEDEFOP. Research activites relating to the monitoring of the development of national TVET systems in the context of ↑TVET cooperation are pursued by the ↑ETF (European Training Foundation, Torino, Italy) (http://www.etf.europa.eu/), an EU institution, within the framework of cooperation with East European, Asian and Mediterranean countries by its own research and particularly by project contracts. European collaborative research activities are also possible within the framework of the EU's ↑Leonardo da Vinci programme and its current *Lifelong Learning Programme* phase from 2007 to 2013.

European TVET research is also stimulated by the *Seventh Research Framework Programme* of the EU (http://cordis.europa.eu/fp7/dc/index.cfm) and by the support of scientific networks in the context of COST (European Cooperation in the field of Scientific and Technical Research) (http://www.cost.esf.org/), an organisation of the European Science Foundation (ESF) (http://www.esf.org). These two initiatives refer to the entire range of research from technology to social research, but can be used by TVET research. Unlike the EU's afore-mentioned commissioned research, where many parameters like ↑research field, epistemic interest and methods are often already fixed in the call for tenders, "independent" TVET research with its own project ideas that reach beyond the functionalist framework is given opportunities for realisation here.

The extension of the research field in TVET research leads to the question of the dominant ↑research methods. Here a certain pluralism can be found, too. Whereas in the beginning there was a dominance of hermeneutical methods all over the world – suffice it to mention John Dewey (Edman 1955; Konrad 1998) – nowadays quantitative methods of the social sciences prevail. The choice of methods is the expression of a particular developmental level, a particular epoch of TVET research, and it directly corresponds to the research themes and thus to the type of studies. With the turn towards pragmatic realism since the 1980s the idea of 'the one and only correct' research method was also abandoned. Whilst in a total analysis of a TVET system mostly qualitative methods are used, quantitative methods are clearly preferred when a problem approach is at stake.

Moreover, one has to distinguish between studies that focus on one country and studies that address a topic or national systems in a comparative perspective. The complexity of the field of TVET research and the structural impossibility to define it more precisely also have the consequence that methodological approaches are difficult to develop and that their implementation in research practice is quite complex. One can refer to the still missing international large scale assessments in TVET, which could not be realised so far for this reason. It

is also for this reason that comparative evaluative and categorising total analyses of national TVET systems, which were popular up to the 1990s, are hardly ever conducted nowadays. A widespread type of research are case studies, which investigate various national phenomena on the basis of a clearly defined research field and epistemic interest and juxtapose the results.
Here the cooperation of different researchers from various countries turns out to be particularly fruitful for the results. For the purpose of describing and analysing the state of development or the current state of a national TVET system, the European situation or any other geographical space, indicator-based educational reporting (mostly in the context of the entire national system of education) is becoming more and more important. Suffice it to mention the Conditions of Education (↑USA) or *Bildung in Deutschland*. A valuable tool is the compilation of national data by Eurostat (http://epp.eurostat.ec.europa.eu/) and Eurydice (http://www.eurydice.org/), which has improved considerably over the last few years. The European Research Reports by ↑CEDEFOP that were already mentioned allow for a quick overview of the variety of ↑research methods used and the types of studies.

1.0.5 Who are the Customers and Who Carries out TVET Research?

This leads to the task for the agents who use the results of TVET research to prepare governance decisions, to evaluate their effects or to optimise vocational qualification processes. Besides the dominant state institutions one has to name above all the social partners (employer associations and trade unions). Therefore the national, supranational and international agents who are commissioning research projects can be found almost exclusively in the relevant institutions (like ministries of education, ministries of labour, ministries of science, European Commission etc.).
The tenderers are diversified with regard to TVET researchers and institutions. As already explained there are, besides "original" TVET researchers, scientists from the most various disciplines. This statement also applies to the institutions carrying out TVET research. Besides classical university institutes there are independent research institutions and private consultants.
An intermediate position is assumed by institutes that are run or funded by the state like the Federal Institute for Vocational Education and Training/BIBB (Germany), the ↑National Centre for Vocational Education Research/NCVER (↑Australia), the Centre d'études et de recherche sur les qualifications/Céreq (↑France), the Qualifications and Curriculum Authority/QCA in England or the ↑National Center for Research in Vocational Education/NCRVE or, respectively, the National Research and Dissemination Centers for ↑Career and Technical Education/NCCTE (USA) etc. Besides proper research they also contract research projects and carry out research coordination (at the mandate of the state executive) as well as documentation and ↑reporting on TVET and TVET research. Similar tasks are fulfilled by EU institutions like CEDEFOP and ↑ETF.
An important part for the internal discourse and the external dissemination, and thus for the constitution of the discipline, is played by the scientific associations of TVET research. These have a long tradition in the USA (↑American Vocational Education Research Association) and Germany (Deutsche Gesellschaft für Erziehungswissenschaft, DGfE). At the European level it is the European Educational Research Association (EERA). Like the DGfE in Germany the EERA is an umbrella organisation of researchers with different thematic and methodological orientations. Both organisations feature a commission, or, respectively, a working group for TVET research. Given their diversity, TVET researchers are also represented in other national and international scientific associations, especially in those of sociology, psychology and political science, but always among general pedagogues as independent associations or commissions for TVET research still do not exist in many countries.

1.0.6 Results and Perspectives

TVET research has a history that cannot be described as a closed development, given that the categorisation in one single discipline like education, sociology, psychology etc. is hardly ever possible. This constellation is typical. It also shows

that TVET research is often inter- or multidisciplinary due to its complexity, and that – apart from research in established university institutes and research centres – a multitude of agents is (often only temporarily) active in this domain so that an overview of their research activities is almost impossible.
Moreover, TVET research is often application-oriented and funded via projects. Accordingly this type of research is also attractive for consulting firms and private consultants. This diversity is also an effect of the proximity of TVET to the economy, the ↑labour market and thus to politics. Education and TVET are in the focus at the national, supranational (EU) and international levels (↑UNESCO, ↑OECD) because it is hoped that their development will improve the qualification of the population and promote economic welfare. In order to find out more about these processes, manifold research activities are conducted. This policy-driven research is supported by interested political institutions with increasing financial means from the public budgets. At the moment this is done especially in the EU also with long-term funding perspectives. The agents within this scheme of commissioned research are quite different in terms of motivation and status. It might well be that "serious" sociologists, psychologists, economists etc. who are recognised in their own scientific community occasionally perform studies in TVET research.Sustainable perspectives with regard to the development and cultivation of paradigms, theories and methods in TVET research can be developed rather at university institutes whose primary mission is the edcuation of teachers for the TVET system, and at research institutes whose statutes prescribe that TVET is (also) addressed. Besides these it is especially the national and international scientific associations and the congresses they organise that can contribute to the constitution and consolidation of a recognised discipline *TVET research* via internal and external discourse. The continuity of this discipline is particularly dependent on the development of human resources. Up to now this took place rather by chance in most countries. Very often researchers came from one of the other social sciences. If no undergraduate programme is offered, the specialised education of young researchers as experts for the TVET system should therefore be promoted. As was shown here, the national, supranational and international conditions for the project of consolidating TVET research are particularly favourable at the moment.

1.1 Genesis of VET Research: Case Study of Australia

Philip Loveder and Hugh Guthrie

This chapter describes the genesis and development of research in Vocational Education and Training (VET) in ↑Australia over the last thirty years from the mid 1970s through to the mid 2000s, a period of significant and dynamic change in the vocational training landscape of this country. It traces the origins of research from the watershed *Kangan Committee report* of 1974 through to the present national program of research and evaluation. Finally, there is a discussion on the future of ↑VET research in Australia that identifies some challenges facing research in the system.

1.1.1 Origins of VET Research in Australia: The Period from 1974–1984

↑Research in VET began, as with so many things in vocational education and training in Australia, with the Kangan Committee report of 1974. The committee was established by the Whitlam Federal Government in 1973 to provide advice to the then Minister of Education, Mr Kim Beazley (Senior) on matters related to the development of ↑technical and further education in Australia. It was chaired by Myer Kangan, the Deputy Secretary of the Australian Department of Labour and a renowned educator.
With the exception of ↑curriculum development research, itself hampered by limited funding, little research into vocational education and training was being done in 1974 in Australia. Some occurred in State/Territory education departments, but the results of most of that research were not published.
National research, conducted primarily in the higher education sector, did sometimes have rel-