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Ianina Scheuch *Editors*

# Expanding Horizons

Research on the Internationalization  
of Vocational Education and Training

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# **Internationale Berufsbildungsforschung**

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 Springer VS

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ISSN 2731-6181

ISSN 2731-619X (electronic)

Internationale Berufsbildungsforschung

ISBN 978-3-658-43741-1

ISBN 978-3-658-43742-8 (eBook)

<https://doi.org/10.1007/978-3-658-43742-8>

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The registered company address is: Abraham-Lincoln-Str. 46, 65189 Wiesbaden, Germany

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## Series Editor's introduction

In contrast to many other countries, vocational education and training (VET) plays a major role in Germany. This is true not only with regard to the organisation and implementation of training in the dual apprenticeship system but also with regard to a broad and differentiated research landscape on VET. However, these research achievements are only recognised internationally to a limited extent, which is partly due to the fact that only a limited number of academic publications in the field from Germany are available in English language.

It is therefore very welcome that this volume documents the breadth and quality of VET research in Germany in twelve different chapters. All chapters relate to a topic that is also of significant relevance in an international context. Specifically, the contributions analyse the transfer efforts of VET to other countries. The analyses refer to both the policy level and the level of concrete implementation of transfer projects. It is of particular importance that the chapters take into account very different target countries of VET transfer and cooperation.

In addition, there are contributions that take a meta-perspective and discuss fundamental questions of international VET research from a German perspective.

For the reader of this volume, added value results in particular from the fact that, on the one hand, the latest academic findings are presented here and, on the other hand, very different countries and analytical perspectives are brought together in a compact form.

In this respect, it would be highly desirable if a similar volume with the then current results could be presented in this book series again in a few years.

Prof. Dr. Matthias Pilz  
University of Cologne, Germany

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## Introduction

In contrast to general and higher education, which have (at least in parts) comparable curricula as well as comparable structures and institutions across countries, vocational education and training (VET) is often strongly regionally and nationally oriented, with diverse histories, self-conceptions, objectives, curricula, structures and practices. Internationally, VET is a parceled field. Against this background and a globalized economy, the importance of this volume, which is dedicated to the study of the “Internationalization of Vocational Education and Training”, becomes evident.

In 2017, the German Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung: BMBF) published a call for proposals for the funding program “Research on the Internationalization of Vocational Education and Training” (IBBF). The funding program serves to strengthen and expand institutionalized VET research abroad as a core principle of international VET cooperation. The aim of the funding program was to sustainably strengthen the expertise of universities and other institutions in the research of international VET projects and in the training of academic VET staff, integrate this expertise more closely into the BMBF’s international VET cooperation and make it accessible to foreign partners via established structures, in order to support reform processes abroad in the direction of more practice-oriented and research-based initial and continuing VET (BMBF, 2017).

The research program was based on the German government’s strategy for international VET cooperation, which was adopted in 2013 and updated in 2019, and the five core principles outlined in this strategy (BMBF, 2013, 2019):

1. cooperation between social partners, business organizations, and the state,
2. learning in the work process,
3. acceptance of national standards,
4. qualified VET personnel, and
5. institutionalized VET research and VET guidance.

This volume presents selected results from participating IBBF projects and the accompanying “Meta-Project on Research for the Internationalization of Vocational Education and Training” (MP-INVET). The contributions outline and discuss selected research findings from the projects as well as innovative models and ideas for development perspectives in this research area. Overall, the contributions show how the projects of the IBBF funding program contribute to strengthening and expanding institutionalized VET as well as international VET cooperation.

The funding program includes the meta-project and three main research areas. The structure of this edited volume is based on the structure of the funding program:

### **Framing (Meta-Project MP-INVET)**

- Research on the Internationalization of Vocational Education and Training—Program Evaluation and its Implications by Carla Olivier, Olga Zlatkin-Troitschanskaia and Miriam Toepper
- Networks in International Vocational Education and Training Research: A Contribution to Best Practices by Sandra Bohlinger, Ianina Scheuch, Hoang Long Nguyen, Anne Bieß and Alina Praun
- Professional Development of Doctoral Researchers in Vocational Education and Training: A Cross-National Study in Times of Uncertainty by Anja-Christina Greppmair and Michael Gessler

### **1. Current topics of VET research in the context of VET cooperation**

- Implementation of Competence-Based Approach in Chinese and Russian Commercial Vocational Education and Training by Anastasia Goncharova, Pu-jun Chen, Dietmar Frommberger, Matthias Pilz and Junmin Li
- Quality Development of Vocational Education and Training in India: Supporting and Restraining Factors by Julia Regel, Jakob Schulte, Muthuveeran Ramasamy and Matthias Pilz



## **2. Research on prerequisites for successful VET cooperation in countries with which BMBF VET cooperation exists as well as in other regions and countries**

- Multi-Sided Evaluation of Needs of TVET Students in Problem-Solving Skills in South Africa by Jelena Zascerinska, Jacqueline Scheepers and Martin Kühn
- Ownership by Local Actors: The Case of Dual Vocational Education in Mexico by Natascha Röhrer, Beke Vogelsang, Matthias Pilz and Martina Fuchs
- German VET Providers' International Business Models and the Critical Factors for Entering Foreign Markets by Gunnar Kassberg and Utz Dornberger
- Social Representations of TVET and Non-Academic Work in Mexico from the Perspective of Employers and Youth in the Mexican Tourism Industries by Claudia Hunink and Lydia Raesfeld

## **3. Development of joint pilot measures to build capacity for VET research in BMBF partner countries**

- Vocational Teacher Education and Vocational Education Research in Costa Rica—Status Quo and Perspectives by Irina Rommel, Anastasia Goncharova and Dietmar Frommberger
- ProWoThai—Progressing Work-Based Learning in Thailand's TVET System: Design-Oriented and Participatory Action Research in International TVET Research Cooperation by Thomas Schröder, Siriphorn Schlattmann, Julia Gulich and Barbara Hupfer
- Vocational Education in Georgia—Conception and Implementation of a PhD Programme by Marcel Martsch, Tamara Hennige and Hannes Tegelbeckers

Overall, the volume integrates the research and results of the IBBF projects and the meta-project in order to increase their visibility and connectivity to national and international VET research. Furthermore, transfer approaches of the results and findings from the IBBF funding program on different levels into research, vocational training practice and vocational training policy are outlined.

We would like to thank all authors for their contributions, which offer exciting insights into this research program. We also would like to thank the BMBF for funding the IBBF program and the DLR Project Management Agency for its continuous support of this program.

The Editors (Meta-Project MP-INVET): Michael Gessler, Olga Zlatkin-Troitschanskaia, Sandra Bohlinger, Carla Olivier, Miriam Toepper, Anne Bieß, Anja-Christina Greppmair, Hoang Long Nguyen and Ianina Scheuch

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# Research on the Internationalization of Vocational Education and Training – Program Evaluation and Its Implications

Carla Olivier, Olga Zlatkin-Troitschanskaia,  
and Miriam Toepfer

The research program “Research on the Internationalization of Vocational Education and Training (IBBF)” (2019–2025), funded by the Federal Ministry of Education and Research, consists of eleven international research projects and one meta-project (MP-INVET). A central task of the meta-project is the research evaluation and monitoring of the IBBF projects, to systematically analyze and synthesize the core IBBF results.

Based on a newly developed evaluation concept, the evaluation was conducted using various qualitative and quantitative survey methods, including interviews and standardized questionnaires. This paper presents the key findings of the cross-project formative evaluation based on online surveys. The results demonstrate that, while the IBBF program addresses key theoretical and empirical challenges of VET transfer, the IBBF projects are characterized by a variety of approaches, objectives, networks and research designs. Common to all projects is that they focus on the goal of strengthening institutionalized VET research. However, as

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this evaluation indicates, a high degree of multidisciplinary expertise is required to further expand VET research and develop VET structures. Further recommendations for international VET research and success factors for the development of sustainable VET are discussed in this paper.

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## 1 Conceptual Background and Research Focus

The achievement of greater societal objectives, such as equal opportunities, participation in education or sustainable development, requires data and evidence about the effect of key influencing factors to be able to steer political and practical actions and processes in a targeted direction. Research evaluation can, among other functions, serve to determine the effectiveness and efficacy of policies, programs or projects (Stockmann, 2021). In contrast to fundamental research, evaluation research not only serves to gain scientific knowledge, but also to create a benefit for practice (Döring, 2014; Stockmann, 2004).

In the past few years, the evaluation research approach with its various functions has taken on a significant role in the vocational education and training (VET) sector (Beutner, 2021; Stockmann & Meyer, 2017). Particularly in international VET, a fragmentation of the research landscape due to the various research strands and disciplines involved in this field can be observed (OECD, 2014; Toepfer et al., 2021). Here, for example, impact evaluation of research projects is of central importance, as it can contribute to counteract this fragmentation. Accordingly, evaluation research serves to identify conditions for success and inhibiting factors, from which concrete, actionable recommendations for sustainable international VET cooperation can be developed (Brosi, 2003; Stockmann, 2021). This is important for gaining knowledge and synergies, which can also promote effectiveness and efficiency in international VET (Brosi, 2003; Fretwell, 2003; Frommberger & Baumann, 2020).

In this context, evaluation is understood as a central instrument with different functions. An evaluation can enable a deeper interaction between research, politics, administration and the public. For research, evaluation enables empirical evidence (Widmer, 2004); for policy, it can act as a kind of advisor and innovator (Brosi, 2003). In the context of politically funded programs or projects, evaluation can also contribute to achieving action policy goals (Stockmann, 1996). In the context of the public sphere, it also assumes a democratically responsible role, for example by making evaluation results available to the general public (MacDonald, 1993; Widmer, 2004). In addition, evaluation can strengthen the comparatively low level of financial support in the VET sector (compared to the school and

university sector), also on an international level, since positive evaluation results, for example in developing countries, can lead to an increase in monetary support (Fretwell, 2003; Holmes & Mclean, 2009). However, there is criticism that evaluation efforts ultimately merely produce input–output or target-performance comparisons (Caspari & Barbu, 2010; Stockmann, 2002).

In the program “Research for the Internationalization of Vocational Education and Training (IBBF)” (2019–2025), funded by the German Federal Ministry of Education and Research (BMBF), evaluation research plays a significant role: Strengthening and expanding institutionalized VET research as a core principle of international VET cooperation is one of the IBBF program’s central goals. The aim is to examine current issues and to identify conditions for success and best practices in VET research.

The IBBF program includes eleven international research projects, which are particularly heterogeneous in terms of their objectives as well as their target countries and cooperation partners. Besides the eleven projects, the IBBF program also entails a scientific project, the so-called meta-project (MP-INVET). The meta-project is responsible for conducting a cross-project evaluation. Here, the results of the individual IBBF projects are bundled, systematically analyzed and synthesized (Gessler, Bohlinger, & Zlatkin-Troitschanskaia, 2021; Gessler et al., 2021; Kühling-Thees et al., 2020; Steinert, 2020). This paper presents the key findings of the cross-project formative evaluation of the IBBF program, focusing on the following overarching research question:

*What is the scientific impact of the IBBF program on international VET, taking into account a multi-perspective evaluation criterion?*

To answer the overarching question, the basic understanding of evaluation is presented, the individual evaluation criteria used here are outlined, and specific research guiding questions are defined. Then, the survey method is briefly described, and central evaluation findings are presented. Based on the cross-project evaluation results, implications for the further development of international VET research are derived and critically discussed.

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## 2 Evaluation Framework

Evaluations capture the value of an object; this can be products, processes, projects or programs (Stockmann, 2004). Especially when evaluating projects or programs, the achieved impact of the implemented measure is of great importance. The evaluation carried out within the framework of the IBBF program

follows this *effect-oriented* understanding of evaluation (Silvestrini & Reade, 2008).

In the research context, the implementation of an evaluation requires a systematic and transparent procedure from which the objectivity of the evaluation emerges. Through the use of empirical methods, information is obtained that is examined using systematic procedures and criteria and subsequently evaluated (Stockmann, 2004). The scientific and professional demands in evaluation research are increasing due to the growing significance of evaluations (von Werthern, 2020). However, evaluation approaches are characterized by a high level of diversification (Miller, 2010), which is why the evaluation concept adapted for the IBBF program synthesizes and combines several theoretical approaches and concepts. The two evaluation approaches by Stockmann and the Organisation for Economic Co-operation and Development (OECD) presented below are especially well suited for evaluating the eleven IBBF projects, which are largely dedicated to development, implementation, and transfer work and operate at various levels of action as well as in broad cooperation networks. An appropriate evaluation of these broad-based research and development projects requires integrative models that can take into account various quality perspectives and criteria.

## 2.1 CEval Evaluation Approach According to Stockmann (2007)

The theoretical basis of the MP-INVET evaluation approach consists of the evaluation model, which takes an impact-oriented, theory-based view on evaluation, and combines several evaluation approaches and theoretical models (Stockmann, 2007). The model's understanding of evaluation is based on the evaluation standards of DeGEval (Deutsche Gesellschaft für Evaluation), which were established for the evaluation of VET programs in German-speaking countries (Beywl & Speer, 2004). These standards of *usefulness*, *feasibility*, *fairness* and *accuracy* ensure a fair and high-quality evaluation (DeGEval, 2017).

The standard of *usefulness* ensures that evaluation meets the initial utility and adheres to the specified purpose. The *feasibility* standard ensures that the information required for the evaluation is obtained as cost-effectively, diplomatically, and with as little disruption as possible. The *fairness* standard ensures that participants are treated respectfully and fairly, and the *accuracy* standard ensures that the object being evaluated is described accurately (DeGEval, 2017).

Building on these standards, according to Stockmann (2007), evaluations fulfill different purposes: Evaluations should provide information on the prerequisites for the implementation of a program, strengthen the acceptance of stakeholders, identify conflicts of interest, and support planning. In addition, it can perform tasks, during implementation and afterwards, such as recording intended and unintended effects and challenging program or measure objectives (Stockmann, 2007). Stockmann (2007) assigns various goals to these tasks, some of which are mutually dependent:

1. *Knowledge function*: Evaluation primarily pursues the goal of generating knowledge useful for the stakeholders or the target group of the program. It may be of interest, for example, whether the planned measures reach the target groups or how the project is accepted locally. The knowledge gained is then assessed on the basis of the evaluation criteria, which can then be used to make steering decisions.
2. *Control function*: Evaluation has a control function since it reveals, for example, to what extent the participants fulfill their tasks and whether they have sufficient competencies.
3. *Learning function*: Evaluation also provides a basis for joint learning, as all stakeholders enter into an open dialogue with each other. For instance, as they discuss the successes and shortcomings of the collaboration, conclusions can then be drawn together.
4. *Legitimacy function*: Finally, the results of evaluation can be used to legitimize one's own research, as it documents, for example, what effects have been achieved and how efficiently the allocated funds have been used.

According to Stockmann (2007), the goals of an evaluation are closely interrelated and in part mutually dependent. For example, the learning function cannot be fulfilled if knowledge has not been gained beforehand. Therefore, the functions have to be considered holistically, even though the focus may vary depending on the occasion. In the IBBF program, the focus is predominantly placed on gaining insights and achieving overarching outcomes for international VET research. Therefore, this approach is well suited for evaluating this program.

## 2.2 OECD DAC Evaluation Criteria

To assess the evaluation object, criteria were used that ensure a high-quality research approach. The evaluation of the IBBF program focuses on the evaluation criteria of the OECD's Development Assistance Committee (DAC), as they provide a comprehensive, clear and systematic approach to evaluations and complement each other through different perspectives that are important in the context of the IBBF program (OECD, 2021).

In general, criteria are standards used for evaluation (DeGEVAL, 2017; OECD, 2021). The criteria used – *relevance, coherence, effectiveness, efficiency, and sustainability* (OECD, 2019a, 2019b; Silvestrini & Stockmann, 2016) – are adapted to the specific research objects of the eleven IBBF projects and applied in a target-oriented manner.

The *relevance* criterion examines whether the interventions achieve desirable effects (“Does the measure do the right thing?”; BMZ, 2021). The needs, strategies and priorities of the target groups or the partner institutions are taken into account (OECD, 2019a).

The *coherence* criterion refers to the fit of the intervention in relation to other measures or norms and standards (“How well does the measure fit?”; BMZ, 2021). A distinction is made between internal coherence (fit of the measure within German development cooperation) and external coherence (fit of the measure with activities of the partner or other donors and international organizations) (BMZ, 2021).

The *effectiveness* criterion deals with the direct, short- and medium-term achievement of objectives (“Does the measure achieve its objectives?”; BMZ, 2021). For this purpose, both the intended and unintended effects as well as the possibly differing effects on the individual groups involved and affected are taken into account (BMZ, 2021).

The *efficiency* criterion examines the extent to which the measure achieved results in an economical and timely manner (“How economically are resources used?”; BMZ, 2021). A distinction is made between production efficiency (input–output ratio) and allocation efficiency (ratio between inputs and impacts achieved) (BMZ, 2021).

Lastly, the *sustainability* criterion examines the durability of the impacts (“Are the impacts permanent?”; BMZ, 2021). Possible risks are considered, such as the financial or institutional constraints of a country, which may prevent the measures from being continued in the future (BMZ, 2021).

In the evaluation of the IBBF program, the two criteria of *effectiveness* and *efficiency* were excluded, as they were not the subject of the research evaluation.

Accordingly, given the overarching question of the impact of the entire IBBF funding program on international VET research, the following three research questions can be derived, taking into account the model and the program-specific adaptation of the three OECD-DAC criteria *relevance, coherence and sustainability*, which are focused on in this paper:

1. Which structural conditions can be identified in the IBBF projects that aid the achievement of the individual project goals?
2. Which methodological and data analysis approaches are represented within the IBBF program to achieve the individual project objectives?
3. Which sustainable outcomes of the IBBF projects can be identified?

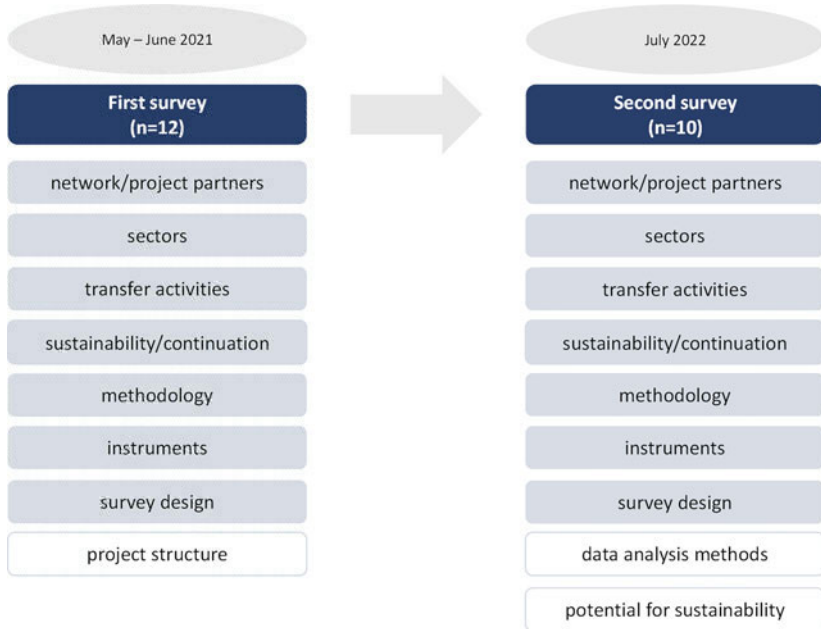
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### 3 Methodology

The underlying formative evaluation design uses data from standardized, online-based questionnaires collected at two measurement points. The questionnaires were developed by the meta-project of the IBBF program and consist of both open and closed questions, which have been previously piloted. This combination approach favors a systematic evaluation of quantifiable data as well as a qualitative evaluation of open questions. In this way, project-specific feedback from the projects has been included. In addition, open questions can help to complement the answers to the closed questions with in-depth insights, thus enriching the evaluation outcome.

The first survey was conducted between May and June 2021, with all eleven IBBF projects (represented by a project spokesperson) responding to the questionnaire, whereby one project provided responses for two project sub-sites ( $n = 12$ ). In the second survey in July 2022, ten of the eleven projects participated ( $n = 10$ ); due to different project durations within the IBBF program. The questions included in the survey covered various content dimensions. Figure 1 shows a schematic representation of the dimensions surveyed per measurement point.

The five criteria mentioned above were adapted to the evaluation and structured into several sub-criteria. For example, under “relevance”, the objective was more closely captured as a sub-criterion, as well as the projects’ knowledge interest. The “coherence” criteria focused on the connectivity to international VET research, which was analyzed by closely looking at the networks and research designs used. The first survey ( $t_1$ ) focused on network and project partners (e.g., integration into various research networks), sectors (e.g., construction industry,



**Fig. 1** Dimensions of the online surveys for the cross-project formative evaluation

education, energy), transfer activities (e.g., dissemination events), project structure (e.g., number of project members), sustainability and continuation (e.g., promotion of young researchers), methodology (e.g., quantitatively or qualitatively), instruments used (e.g., interviews, on-site observation) and the survey design (e.g., longitudinal- or cross-sectional study).

The central focus of the second survey ( $t_2$ ), in addition to the aspects addressed in the first survey (see Fig. 1), was the data analysis methods used (e.g., evaluation method and evaluation criteria) as well as the potential for sustainability and the relevance of the findings to international VET research.

The instruments used are archived and can be viewed in a Research Data Center. Descriptive analyses were conducted to answer the underlying research questions (see Sect. 2.2).



## 4 Results

This section presents the findings of the second online survey. At crucial points, a reference is made to the first online survey to clarify the evaluation process.

### 4.1 Structural Conditions of the IBBF Projects

In the context of this evaluation, the term “structural frame” refers to the personnel structures of the projects as well as all national and international collaborations and research networks within the IBBF program. The structural frame of the IBBF projects illustrates their interdisciplinary and transdisciplinary approach (see Table 1), which was surveyed at the first measurement point (see Sect. 3).

In Germany, a total of 69 project partners are working within the IBBF program and 15 research disciplines are represented, ranging from pedagogy, to

**Table 1** Structural frame of the IBBF projects<sup>1</sup>

Project	Number of project members in Germany	Research disciplines within German project	National cooperation partners	International cooperation partners
CapeVet	5	2	2	1
CodeVet	7	4		3
CoRiVet	5	4	1	4
DualReg	6	2	2	2
efach	4	2		2
IntVet	6	4	1	1
KuPraMex	6	4		4
PeruDual	5	3		2
ProWhoThai	5	3		5
VoCasion	16	3		2
QualIndia	4	3		4
Total	69		6	30

Note. For explanations of the project abbreviations, see Table A1 in the Appendix

<sup>1</sup> For more information, see <https://www.blogs.uni-mainz.de/fb03-mp-invet-en/research-projects/>

geography, vocational education, sociology, educational sciences, ethnology, organizational science, educational sciences, to business, and economics. To achieve the respective project goals, the projects cooperate with 30 international partners and institutions in the target countries. Universities from the target countries as well as actors from the political field are represented as partners. The international orientation of the IBBF program is noticeable as there are significantly more international than national collaborations. Each of the eleven projects has a cooperation with at least one university in the target countries, almost 75% of the projects cooperate with companies and/or political actors and almost 55% of the projects are collaborating with research networks. All projects aim for a nationwide reach of their results, whereby five projects also aim for a regional reach of their results.

Compared to the first survey ( $t_1$ ), the number of national collaborations has increased. A total of twelve national collaborations were indicated in the second survey ( $t_2$ ), including seven universities, two partnering institutions and the MP-INVET meta-project. The projects rated the quality of the cooperation on a four-point scale. The collaboration with universities was rated highest<sup>2</sup> with 2.9 score points, followed by the collaboration with the meta-project (2 score points) and subsequently the collaborations with institutions, which received the lowest rating (1.5 score points). The national cooperation was rated differently in  $t_1$ : The projects gave the best rating for cooperation with institutions (3.0 score points), followed by cooperation with the universities (2.3 score points). Overall, the cooperation with national universities was rated highest among all cooperation forms within the IBBF-program.

Conversely, a reduction was found in international collaborations, with a total of 28 collaborations ( $t_1$ :  $n = 30$ ). At the international level, the projects maintain collaborations with universities ( $n = 21$ ), government institutions ( $n = 2$ ) and education providers ( $n = 2$ ). Cooperation with universities was rated highest (2.5 score points). Both government institutions and education providers were rated less well in terms of collaboration.

The survey also asked how many and which sectors the IBBF projects focus on in their research. Four projects focused on one sector, three projects on two sectors, one project on three and one project on four sectors. In total, the education sector was represented with 29%, followed by the industrial sector with 23%, the commercial sector with 18%, the energy sector, the tourism sector with 12% each, and the gastronomy sector with 6%.

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<sup>2</sup> The better the cooperation was rated, the higher the value.

The networks of the IBBF projects are used for the project work. By relying on broad networks, the projects achieve the objective of gaining field access to important stakeholders in the target country (37.5%), in the consultation and support from the field (43.75%) and in the dissemination or awareness of the project in the target country (18.75%). These three aspects also represent the benefits of networks. The most mentioned element for a functioning network is collaboration (40%). The elements of knowledge transfer (20%), commitment of all participants (20%) and access (20%) are also important. A total of 22 networks are used within the IBBF program. The ECER network was mentioned most frequently by the projects ( $n = 6$ ).

The studies of the respective projects had different scopes, ranging from institutional and local, to regional and supra-regional, to international. More than half of the projects indicated an international scope for their research (58%). Furthermore, 25% conduct nation-wide research and 17% regional reach.

## **4.2 Data Basis and Analysis Approaches of IBBF Projects**

Overall, 62% of the IBBF projects collect qualitative data, 23% quantitative data and 15% other types of data. Six projects only used qualitative methods and four projects used two types of data collection. All projects of the IBBF program carried out a total of 23 data collections. Data collection has taken place at between at least one and a maximum of three measurement points in each project. At  $t_1$ , a total of 18 surveys had been conducted across all eleven projects. All studies are cross-sectional studies ( $n = 10$ ).

Questionnaires, observations, interviews, and other survey methods such as document analysis were used by the projects. Four projects use a questionnaire, four projects use observation, and ten projects conduct an interview. Seven projects indicate other survey instruments such as document analysis (e.g., curricula).

To carry out extensive analyses, the IBBF projects use various survey instruments. Five projects use two survey instruments (e.g., interviews and document analysis), two projects use three survey instruments (e.g., interviews, documents analysis, and observations), and two projects use four survey instruments. Just one project uses one survey instrument (interviews). All projects ( $n = 10$ ) conducted interviews, with an average length of 54 min per interview (min. 30 min; max. 90 min). Individual interviews ( $n = 8$ ), group interviews ( $n = 3$ ), and/or expert interviews ( $n = 9$ ) were conducted across all projects. Two projects used three types of interviews (individual, group and expert interviews), six projects

two (e.g., individual and expert interview) and two projects one type (individual). Two projects conducted structured interviews, all others used semi-structured ( $n = 8$ ) or free interviews ( $n = 1$ ).

Four projects use observation. Observations lasted 40 min on average (quantity: min. 10; max. 109 observations). Field observations ( $n = 3$ ) and non-structured observations ( $n = 1$ ) were used. A total of 167 observations were carried out.

Questionnaires were also used to collect data ( $n = 4$ ). A minimum of five items and a maximum of 55 items were used. Surveys with questionnaires used both self-assessments ( $n = 4$ ) or validated scales ( $n = 2$ ). The surveys were implemented both digitally or on-site. Seven projects carried out their surveys on-site in the respective target countries. The digital surveys were carried out for seven projects and four projects opted for a hybrid implementation. Four projects collected data by using one survey instrument. Three projects used two survey instruments and three projects used three survey instruments.

To establish the database for the eleven projects, people from companies, schools, universities and state institutions were interviewed (see Table 2). A total of 238 institutions were surveyed. A minimum of four and a maximum of five institutions were considered in all projects. Three projects collected data from data less than ten institutions, four projects collected data from less than thirty institutions and three projects collected data from over 30 institutions.

At the individual level, a total of 452 subjects were interviewed. A minimum of five and a maximum of 151 people were interviewed by the projects. The average is 45 interviewees per project. Overall, five projects have fewer than 20 interviewees; four projects between 20 and 99 and one project over 100 interviewees. 61.04% of those surveyed were teachers, 10.7% employers offering VET training and 10.54% trainees. Less than 10% were in the professional group of skilled workers (5.02%), researchers (3.01%) and entrepreneurs (7.86%).

Due to the international nature of the projects, data are collected in English, German, Spanish, Russian, Chinese, Georgian, Vietnamese, and Thai. All projects submit data in different languages. Four projects indicated German data as the basis for the analysis. Six projects worked with English data, four projects worked

**Table 2** Overview of surveyed institutions in absolute numbers and in %

Company	School	University	State institution	Other	Sum
194	103	43	41	71	452
43%	23%	9%	9%	16%	

with Spanish data. Other languages, e.g. Russian, Chinese, Vietnamese and Thai were mentioned by four projects. The result is a proportion of 33.3% English data, followed by 22.2% data in German and Spanish.

The database of the analyses relates to documents (31%), observations (16%) and interview transcripts (53%). All projects ( $n = 10$ ) analyzed interview transcripts, three projects used observation, and six projects used documents for analysis. Four projects used interview transcripts exclusively, while three projects opted for two data sources (e.g., interview and documents), and three projects for all three.

The responses to the question about challenges pertaining to data analysis were categorized and summarized: Dealing with the available data for the best possible evaluation was identified as a challenge ( $n = 4$ , e.g., comparing and adjusting categories for coding data in a different country context). Further, the language ( $n = 2$ , e.g., documents in target language) and the categorization in the analysis ( $n = 2$ , e.g., considering a different cultural context) were named as a central problem of the data analysis. The use of qualitative research methods was also perceived as a challenge ( $n = 3$ ).

Next, the responses to the evaluation criteria of the study were categorized and summarized: The evaluation criteria and the theoretical basis were considered separately. *Validity* ( $n = 4$ ) and *triangulation* ( $n = 4$ ) were mentioned most frequently as evaluation criteria. The quality criteria for the research objects ( $n = 3$ ) were also given as an evaluation criterion. The selection criteria for the research objects, *validation by experts* and *theory-based evaluation* as criteria for projects were each reported back once.

Four projects used a theoretical model to consider the research question. One project builds its theoretical foundation on two different models and combines them. Three projects indicated the use of multiple models for theoretical modelling.

### 4.3 Sustainable Outcomes of the IBBF Projects

In this context, ensuring the sustainability of the project goals refers to the concrete results, outputs and products of the projects, which include, for example, publications and conference contributions, activities for transfer and research dissemination as well as the promotion of young researchers.

Regarding sustainable outcomes, different evaluation facets can be used. One focus was on the publications. The evaluation survey included questions on both the number of publications and the languages used. Six projects reported publishing in German (33%), nine projects in English (50%), two projects in