

## Chapter 2

# Vocational Education Research: Research on Vocational Pedagogy, Vocational Discipline and Vocational Didactics

Jörg-Peter Pahl

**Abstract** The chapter introduces the occupation and vocational education as a subject of research and their research framework, which include the emergence and origins of didactic approaches and concepts of vocational teaching and learning. The author reviews the history of research on vocational disciplines and vocational didactics at universities and the relation between research on occupation and vocational education and its methods in contemporary historical retrospect. Areas, bounds, and working fields of vocational pedagogy, vocational didactics, and vocational disciplines are also analyzed. The author further predicts the development opportunities and prospects for the subjects of vocational didactics and occupation research on vocational education.

### 2.1 Occupation and Vocational Education as a Subject of Research in Nonacademic and Academic Sectors: Introduction

The concept of vocational education as a specific part of what has been and is being discussed as education has been schematized expressis verbis not until the end of the eighteenth and beginning of the nineteenth century, the term “vocational education” has been used in the word combination of vocation and education (Humboldt 1964). It was meant as “basically each level of the direct education for occupations, especially the training for middle class positions as officer, merchant, master craftsman” (Georg and Kunze 1981, p. 38). In the cause

---

The article refers to the research situation and its genesis in Germany.

---

J.-P. Pahl (✉)

Faculty of Education, Technische Universität Dresden, Dresden, Germany  
e-mail: joergpahl@aol.com

of time, however, the term was used in constricted form only in connection with vocational education of young people from the lower social strata.

The circumscribed interpretation of the term “vocational education” in the field of nonacademic vocational training and continuing education has been maintained fundamentally until today. Over the past 200 years, from prevocational education in secondary levels I and II to nonacademic vocational training in secondary sector II and academic vocational education in tertiary sector to vocational and academic continuing education in quaternary sector were intended, “a new relationship between general and specialized/vocational education need for research in the area of vocational education” (Buchmann 2002, p. 3).

Consequently, it is highly commended “to work on academic vocational training harder than ever before in the research of vocational and economic-pedagogical training, and to make its theories and previous findings from the research of nonacademic vocational training fruitful for the research in the tertiary sector” (Buchmann 1999, p. 77).

Researches in the context of such a complete vocational education and training system, i.e., the integrative inclusion of the nonacademic as well as the academic subsystem are meaningful and necessary under the aspects of system theory as well as structure, organization, and curriculum, i.e., learning organization and didactic methodology. With such an expanded research approach, historical, current, and future developments are to be analyzed and studied systematically and system-theoretically.

## **2.2 Emergence and Development of Conceptual Approaches in the Framework of Occupational Research and Vocational Education Research**

### ***2.2.1 Emergence of Didactic Approaches and Concepts of Vocational Teaching and Learning***

First didactic-methodological approaches and concepts for nonacademic vocational education have already been developed at the turn of the twentieth century by industrial enterprises and educators (Dörpfeld [1903], 1962, 1973; Rein [1893/1908], 1952, p. 34; Kerschensteiner [1912/1965], p. 33). Only until the 1920s, were these conceptual approaches which was known as the “Frankfurt methodology” first established vocational didactics. The conception of the “Frankfurt methodology of specialized training courses in vocational schools” (Botsch et al. 1950)<sup>1</sup> showed characteristic features of a type of didactics in a special curricular,

---

<sup>1</sup> See also the “Informative Overview (informative Gesamtschau)” of Schmale (1967) in the journal “The German Vocational and Technical School (Die Deutsche Berufs- und Fachschule).”

learning-psychological, and organizational structure. This didactic-methodological perspective is identified as the “most famous and most far-reaching technique-didactic conception” (Ott 2011, p. 135).

In the restoration phase after the Second World War, people oriented themselves largely back to the principles of the Frankfurt methodology, but there was a greater focus on experimental learning and working. Based on the Frankfurt methodology, Möller (1951a, b) developed conceptual approaches for workshop and demonstration lessons for course design, for teaching methodology, and for teaching materials. Glunz (1962) modified the teaching concept “experiment” decisively further by adapting it to the conditions of the workshop and laboratory of vocational schools. Yet, Stein (1958, 1965, 1983) developed a basic form of a systematic technique-didactic approach for vocational learning with the teaching concept “Experimental training course”. The change in the employment and social system in the 1960s led to new didactic considerations. The discussion on the didactics of vocational learning received new impetus through the social changes, especially in connection with the so-called “1968-generation of teachers.” The focus of the very controversial discussions included a stronger orientation on scientific disciplines and subjects. The basic principle of these specialized science-oriented approaches were, in particular, the didactic simplification, reduction, and later the didactic transformation (Herring 1958; Grüner 1967, 1975, p. 85; Kirschner 1971; Kahlke and Kath 1984), as well as the sequence of steps “Discipline → Material analysis (state of the research, theories, development) → Didactic analysis/reduction (subject systematic, material structures) → structures, contents of vocational education” (Nickolaus 2006, p. 57). However, due to its close relation to scientific discipline, the subject-didactic approach was only conditionally sufficient for educational requirements for a comprehensive and practical vocational education. The same also applies to the interoccupational specialist area or domain-oriented subject didactic approach, which was developed in the mid-1970s. Then Hauptmeier et al. (1975) indicated about it with the realization of complex didactic reduction.

Although the work field and domain-oriented didactic-methodological approach which was developed and has been significantly expanded in the 1990s, takes the work field or domain as well as the related professional work including associated working processes and the educational interests of the individual into consideration, and a relatively broad approach of interoccupational didactics, where a significant transformation and reduction based on the specific needs of each training occupation is required as a general rule. However, not all occupations and certainly not all recognized training occupations could be considered equally and in a didactically appropriate and necessary manner. Therefore, the development of didactics based on occupational field seemed to be didactically reasonable. This

---

(Footnote 1 continued)

and Wissing [1932/1980a, 1954a/1980b, 1954b/1992], 1968; Wissing et al. [1960/1992]; Botsch [1927/1980]; Geißler [1941/1992]; Botsch et al. 1950, p. 55; Glunz 1962, p. 45.

approach focuses on a particular occupational field and on the related or associated occupations and thus provides a systematically clearly defined field didactics in the sense of Grüner's definition (Grüner 1981, p. 543). As an ideal didactic case, occupation didactics focusing on a particular occupation seems to be meaningful. This desirable vocational didactic approach is, however, practically impossible to realize because of the associated research activities, necessary implementation costs and required, yet currently unavailable resources. Regardless of it, there are already various contributions to the genesis of relevant research on occupational disciplines and vocational didactics (Pahl 2005, p. 27).

The concerned subject and vocational didactic concepts in the field of nonacademic occupations and nonacademic occupational training did not emerge on the basis of a program or as a result of systematic research plan on occupations and occupation fields and/or on vocational training. In addition, past didactic research usually focused on the area of general education, but hardly on the field of vocational training. Accordingly, the relevant research on vocational education and training distinguished itself relatively late, i.e., from the beginning of the 1970s (Rauner 2005, p. 9). Research on the nonacademic occupations conducted by didacticians was barely rudimentary.

## ***2.2.2 Origins of the Research on Occupation and Vocation-Organized Activities Under the Aspect of Education Since the Beginning of the Twentieth Century***

### **2.2.2.1 Genesis of the Research on Occupation and Vocational Training in Nonacademic Sector**

At the peak of industrialization in the beginning of the twentieth century, Gilbreth (1911) took initial research approaches of activity and job analysis as tools for the identification and description of the training content. But only with the methodological instruments for the selection and instruction of Frederick Winslow Taylor, has the attempt for a scientifically justified methodology been made. This should be carried out particularly through rational intervention of skills, which are necessary for task fulfilment (Roesler 1913, p. 132). He was concerned about the appropriate methods to bring the knowledge required for the effective execution of planned activities into the brains of the workers (Volpert 1977, p. 32). Although these methods of the engineer Taylor for work organization from a psychological perspective sparked criticism and suggestions for improvement, they still found multifaceted access into the discussion of vocational pedagogy (Seymour 1960). However, their adaptation to identifying the qualification requirements in connection with the development of vocational training and teaching materials was hardly carried out.

It should be noted that similar research approaches—also limited to the non-academic occupations and nonacademic vocational training—in Germany had their roots in the works, which had been started by the German Committee for Technical Education (DATSCH) even before the beginning of the First World War.

Initial analyzes and studies on occupations and concept development of occupational teaching and learning took place firstly and even before the related studies were carried out at universities, in companies, and institutions for vocational training, which are later known as vocational schools. The works DATSCH founded in 1908 can then be referred to as preforms of research on occupations, in general, and occupations, in particular, and as beginnings of scientific observations on occupations and their education. In this context, the occupations existing in the industrial practice have been increasingly described in detail in the form of knowledge and skills to be taught. As instruments, the inspection and survey served especially for selected industrial enterprises.

The works of DATSCH have led to considerations on occupational science and occupational didactics differently compared to the activities of the German Institute for Technical Vocational Training (DINTA) founded in 1928. Parallel to the works of DATSCH which was essentially directed to industrial training, the so-called “Frankfurt methodology”—today it would rather be referred to as subject didactics for vocational schools—was developed at vocational schools by renowned vocational educators as the result of teaching experiences with theoretical considerations and practical teaching proposals. Teachers in vocational schools carried out preforms of the science-oriented studies, as new techniques and working processes emerged, which were neither specified in the up-to-date curricula nor being prepared by the academic colleges.

Although the vocational curricula developed by DATSCH in the 1920s and 1930s in a systematic form had been developed primarily for didactics and methodology of vocational training in company, but worked remarkably well for the structure and organization of vocational schools (Herkner 2003, p. 4).

The systematizing works of DATSCH were carried forward and developed methodically after the Second World War, i.e., from 1953 by the Center for Vocational Training (ABB) and later by the Federal Institute for Research on Vocational Education (BBF) and then the Federal Institute for Vocational Education (BIBB). BIBB’s tasks have been defined *expressis verbis* for research on vocational education in a modified form in the Vocational Education Promotion Act. As major subjects of research, occupation, the content of occupation-related work and work processes under the aspect of education crystallized themselves.

The qualification research by the BIBB characterized by the labor- and social science-oriented methods of the workplace and occupation analysis as key, but it had hardly found any entrance into the curricula research. As a special task area in BBF/BIBB in the tradition of the forms developed by the DATSCH and in the ABB, namely the training content and objectives to identify in close dialog with experts from the social parties, the research field “curricula” had hardly changed methodically. Not until the mid-1990s had the discussions on the further

development of instruments of qualification research for the development of modern means of curricula been taken up again (Becker and Meifort 2004).

Although it was recognized that it was not possible to start back from where they had left off in 1933 in vocational education (Monsheimer 1956, p. 181), the “Frankfurt methodology” formed an important basis for the learning concepts of vocational school again after 1945—as already stated. The generation of teachers in vocational schools analyzed the occupations (Krause 1962) and the new work situation and they worked primarily on teaching methods and media (Monsheimer 1956). During the 1970s and 1980s of the last century, remarkable studies developed from the work of vocational schools or pedagogical papers that have been produced within the framework of the second state examination for teachers at vocational schools, for example, the “didactic simplification,” “didactic reduction,” and “educational transformation” (Hering 1958; Grüner 1967, p. 85; Kirschner 1971; Kahlke and Kath 1984) and for the dealing of technical problems in the classes of vocational schools (Schad 1977a, b). Initial theory-based studies were also carried out at this time in vocational schools, and this was not known or recognized by a wider public.

Overall, the participation of industrial and academic experts in the curricular work on the development of occupations and occupational fields had gained increased importance of vocational disciplines and vocational didactics since the early 1970s. This statement still applies, because—as Howe (2001) describes—a more secured basis for the curricula development comes into existence with it. An important milestone in the development of non-university research on vocational disciplines was the initiation and implementation of pilot projects in the form of school-based and economic-design-based studies (Bähr and Holz 1995). In their majority, they turned to specialized occupational issues with these projects. In the context of more recent considerations on thematic bundling of these studies—such as that of the BLK program, setting out a framework for studies under the title “New learning concepts within the dual vocational training” (Ploghaus 2001)—has now been strengthened, in order to initiate and push forward a research, which is aimed not only at the specialized area of occupation, but also on the occupation-related work and working processes. All these researches focused mainly just on the nonacademic occupations.

### **2.2.2.2 The History of Research on Vocational Disciplines and Vocational Didactics at Universities**

The research on vocational disciplines at universities has been developed particularly in the context of the training of vocational teachers. The more the program concepts lined up with the goal of occupation-qualifying study, the more intensively turned the research and teaching in the questions of vocational disciplines.

At the Technical Universities of Dresden and Karlsruhe, as well as at the University of Hamburg, for example, vocational teachers have been trained since the 1920s of the last century. Since during that time at the University of Hamburg, for

example, related engineering science could not be resorted to in the industrial-technical subjects, professional understanding began to emerge here, which was clearly characterized by the confrontation with the occupational practice of vocational teachers in their respective occupation fields. Eventually, the concept of “teaching-oriented specialized science” grew as the result of this (Hass 1980, p. 87).

Similar developments can be shown for vocational disciplines that find no equivalent in the established academic system. In the continuous shift of the training of teachers for higher teaching positions in universities in the 1960s, neither a complete approach to teaching and research in vocational subjects was available, nor was this formulated as a task area for newly developed courses. The issue of the related sciences that are not directed sufficiently to the vocational work to be provided was implied.

Although the demand that there should be a research on vocational discipline—complementary to the vocational pedagogy, was and still is not uncontroversial in the discussion on vocational pedagogy, yet by no means new. In the absence of research on vocational discipline, Abel (1963, p. 4) even saw a faulty development of vocational pedagogy, because then it locked itself in front of “vocational discipline as the basis for the (...) vocational training”. Hoffmann (1966, p. 534) from the ZIB also place the expression “research on vocational discipline” consciously “in the position of the previous formulation ‘research on vocational pedagogy’”. Because such—admittedly very initial—considerations have not been taken into account in the subsequent period, vocational pedagogy brought itself “to the chance, to become aware of the discrepancy, which occurred in the vocational issue, between thought and reality, fact and concept” (Müllges 1975, p. 811). Insufficient attention to the actual vocational situation, i.e., the “facts in the workplace” (Abel 1963, p. 3) can in turn lead to a loss of truth of the theoretical education in vocational pedagogy. Grüner (1970, p. 446) urged, therefore, for “research on vocational discipline at all levels” in addition to research on vocational pedagogy in connection with the (further) development of vocational pedagogy in the 1970s of the previous century already. Similarly, Karlwilhelm Stratmann has requested, in the context of curricular considerations for basic vocational education for the evaluation of jobs and there to be indexed activities, “to arrange the research on vocational discipline more differentiated if one wants to skip the close relationship-boundaries between job groups” (Stratmann 1975, p. 341). Whether “the research on vocational discipline” called by him was meant as a specific research program or an independent vocational discipline remains to be seen. Stratmann stated in the same article that the “construct of vocational discipline and vocational pedagogy” (Stratmann 1975, p. 344) of an occupation should be established with the research on curriculum. The combination vocational discipline and vocational pedagogy indicated, however, conceptual uncertainty.

Even today one could agree with Müllges (1975, p. 801), that the “scientific constitution of vocational pedagogy” is still an unfinished task. Therefore, without that this has always been so explicitly expressed, an additional independent vocational discipline that adapts the traditional understanding of vocation to the current and future vocational situations, includes learning and educational issues,

and with which particularly the issue of reference science can be resolved, was demanded (May 1978). In connection with the generation of an independent vocational discipline—as Müllges (1975, p. 810) stated—the fear “that the vocational pedagogy turns out to be an unnecessary discipline” must be dispersed. Since the training of teachers with the study for higher teaching positions at vocational schools at the universities was formed and established gradually in the 1970s of the last century, the issue of reference science turned out to be increasingly significant and important in the next decade. It was evident that the associated research on “vocational disciplines” for university training of teachers as reference points for the didactics of vocational learning was missing. Although Grüner’s criticism that subject didactics in many universities was conceptionless, and neither was teaching- nor exam subject was generally justified, it can be shown, however, that since the late 1950s, new approaches and concepts have been developed, in which issues of didactic simplification, didactic reduction, and didactic transformation were analyzed and studied (Grüner 1967). Scientific work on didactic simplification, reduction, and transformation that originated from habilitations (Herring 1959) and dissertations (Möhlenbrock 1979) can certainly be classified as crucial didactic research on vocational learning. It can also be assessed beyond the narrow specialist work and as an interdisciplinary-applied work on complex didactic reduction (Hauptmeier et al. 1975). In addition, the didactic works of Doris Elbers (1973) are worth mentioning. In subsequent years, although didactic-methodological observation priorities were laid holistically, the vocational work was still largely disregarded (Bonz 1980).

At the beginning of the 1980s, Gustav Grüner put a remarkable didactic approach under discussion. He held the opinion that, for the preparation of curricula, “didactics of the training occupation” (Grüner 1981, p. 544), in which not the subject but the occupation becomes the starting point, can be didactically useful and helpful. Without direct reference to these important ideas, but often developed on the basis of them, significant researches of vocational discipline on subject-didactic and vocational didactic approaches for vocational education were carried out and published in the following years. These approaches were based largely on teaching experiences and experiments of vocational educators (Mausolf and Pätzold 1982; Nashan and Ott 1990; Kuhlmeier and Uhe 1992; Pätzold 1993; Bonz 1995; Lipsmeier 1995; Pahl 1998a/2000; Ploghaus 2003).

By the end of the 1990s, various research results and concepts in the field of didactics in vocational teaching and learning have been developed. There were a large number of profound, extensive, but largely insular research results. These, therefore, did not constitute self-contained vocational didactics for long. However, approaches to this could and can be seen in the reflections and researches on the occupation field didactics (Bonz and Ott 1998; Pahl 1998b; Horn 1996). Targeted scientific and systematic researches on the didactics of vocational teaching and learning have been hardly initiated and launched by this time.

Only pilot projects that received scientific guidance provided resources for research on vocational didactics and vocational science at universities. The professional and vocational didactic competence of the researchers was challenged in

particular. More than three decades, pilot projects researches have made a truly significant contribution to a differentiated research landscape according to occupations and occupational fields. It could be mentioned, for example, the research on employment, work, and further education in European automotive handcraft (Rauner et al. 1993) and the development of a European occupational profile “automotive mechatronician” for initial training in terms of the work-process-oriented structure of the teaching content (Rauner and Spöttl 1995). The model project for maintenance training is also based on a vocational science research (Pahl 1998c). The same applies for the task analysis for curriculum development in the automotive sector (Becker et al. 2002) and the publications “Curriculum design I” (Kleiner et al. 2002) and “Curriculum design II” (Reinhold et al. 2003).

The founding of the Association of Higher Education Institutions for industrial and technical training (HGTB) was of great importance for the research on vocational science and vocational didactics in universities and subsequently the founding of the working group of vocational science (GTW), which is incorporated into the association for labor study. The tasks and results are documented in the agreement of the HGTB (Hoppe 1990, p. 377) in the conferences conducted since then, in the Aachen Declaration of the Working Group GTW published after warth (2003), and in various publications over the last decade and a half.

If one analyzes the overall state of the discussion at the end of the twentieth century and the demand for separate “vocational science” (Pahl 1993, p. 53) which was strongly raised in the early 1990s of the last century, then the research on vocational education could be developed especially at the points where vocational discipline had been established.

Broad agreement prevailed since the 1990s, that in general, understanding vocational discipline is understood as “theory of occupations” for university demand. The type of vocational work and the qualified form of work were denoted by the evolving concept of “occupation”, through which the consumption of socially produced goods can be participated in. The generation of occupation-related science, i.e., vocational discipline, was therefore estimated as a remote goal of scientific research—albeit similar to its time during the emergence of educational sciences (Dilthey [1988/1961]). Extensive scientific studies not only just in occupation-related field, but also in the field of occupation-related work, i.e., the work organized in vocational manner were therefore required (Rauner 2002a, p. 445). This extended research approach was (and is) absolutely necessary for the generation of a self-contained and generally effective, i.e., scientifically based system of “vocational discipline”.

Initial respective research approaches of vocational discipline have already been launched in the late twentieth century. They should aim to “establish a connection between the skills incorporated in vocational work, the development of occupational profiles, and the grounds of contents, aims, and structures of vocational education” (Rauner 2002b, p. 317). Research defined as such is beyond social science-oriented, because this is “limited to the analysis of vocational activities and lacks the subjective dimension of vocational work: the vocational competence and competence development” (Rauner 2002b, p. 318).

Therefore, the research work should be extended to the fields of vocational discipline, vocational psychology, industrial sociology, vocational pedagogy, and curricula (Rauner 2002b, p. 319). With such an interdisciplinary structured qualification research, it was hoped that vocational discipline would manage to take the expected role to professionalize the work, i.e., the training of vocational education teachers (Martin et al. 2000, p. 27; Gerds et al. 1998). The former scientific research approaches, however, focused almost exclusively on the nonacademic area of the research on vocational training. Research on vocation and vocational education for the academic education sector *sui generis* was hardly considered so far—leaving aside the fact that the academic vocational training for teachers at vocational schools was definitely a research topic.

### ***2.2.3 Relations Between Research on Occupation and Vocational Education and its Methods in Contemporary Historical Retrospect***

Research and development in the field of occupation and vocational education as interdisciplinary tasks and topics of the dialogue between science and practice was conducted in greater extent since around the early 1980s. The increasing participation of non-university research and the representatives of the conference of vocational education planning “Hochschultagung Berufliche Bildung” have contributed greatly to the further development of research on occupation and vocational training. The same can also be stated for the Vocational Education Congresses organized by BIBB. The vocation-related topics outweighed in the content structuring of these events.

Not least from the results of the cooperation between the representatives of theory and practice, it became successively and, in particular in recent years, clear that systematic research in the field of occupations and vocational education in the vocational disciplines of specific research concepts and methods was needed.

In order to find out adequate research methods, two ways were treaded in the following period: On the one hand, by resorting to elaborated traditional research methods of the established sciences; on the other hand, through methods that had already been applied to studies (e.g., in the context of pilot projects) on occupations and occupational fields. For the first way, barely any clear method was available at that time. In order not to immediately fix too much on a specific research instrument—and in particular, the associated research methods—of those research methods that have already been established or at least very often applied from other disciplines should be sighted at first as many as possible.

In the second way, however, the arsenal of methods used is rather hidden embedded in projects and experiments of vocational pedagogy and vocational disciplines. Although since the early 1990s, the question of specific or explicit research methods of vocational science have already been discussed within

research projects and experiments, selective approaches have only become visible until the end of the twentieth century (Rauner 1998b; Spöttl 2000).

Rauner made an attempt at the methodical classification of studies (1998b, p. 14). Accordingly, a similar approach to method development for research on occupation and vocational training should be based on the following considerations:

- The specific occupation-related objectives, contents, and forms of working and educational processes must be defined at first.
- The analyses of contents and forms of working and educational processes in various occupational fields require contextual research and development methods.
- Research and development tasks, as well as research methods, must be identified and clearly defined.

On retrospection, it shows that during the overall development—to be assessed very positively—of cooperation between occupation research and vocational training research, including their methods, nonacademic occupations, and nonacademic vocational training stood at the center of the researches. The academic occupations and academic training, however, were—as already mentioned—barely subject of respective researches until very recently.

## **2.3 Current Status of Research on Occupation and Vocational Training in Nonacademic Subjects and Academic Disciplines: Working Fields of Vocational Pedagogy, Vocational Didactics, and Vocational Disciplines**

### ***2.3.1 Areas and Tasks of the Current Research on Occupation and Vocational Training and Their Boundaries***

Occupations and the knowledge about occupations are a key issue for the research on occupation and vocational training. Today, there is broad consensus that research in vocational subjects and in vocational disciplines (Pahl and Herkner 2010) can and should be built on the existing knowledge about occupation research and on the results of vocational training research. This mainly concerns the research results in the field of

- Vocational training institutions and research on learning place,
- Addressee and target groups,
- Research on curriculum and training organization,
- Teaching and learning research,

- Vocational socialization research,
- International comparative research,
- Further education research, and
- Evaluation research (Arnold and Gonon 2006, p. 186).

Focuses of specific occupation research include:

- Analyses and systematization of tasks, activities, and working materials,
- Status allocation through occupation research,
- Qualification and competence,
- Decision-oriented, i.e., dynamic occupation research,
- Vocational dynamics: occupational transition and vocational change,
- Quantitative occupation research,
- Professionalism and deprofessionalization,
- Vocation in the globalization, and
- Occupation forecasts (Dostal 2005a, b, p. 107).

Initial widely applied literature show already the issues of economics and business administration, health and medicine, labor market policy, and labor law are examined and discussed among others in connection with the subject “vocation.”

With a respective comprehensive and interdisciplinary occupation research, a significant contribution to vocational education research can be made (Rauner 2005b, p. 9; Dostal 2005a, b; Euler et al. 2010). Occupation research provides comprehensive, systematically founded, and effective statements for vocational education research. In particular, information and data on job content and required competences of each occupation should be provided. Occupation research is therefore interpreted as a part of vocational education research. In any case, research on occupation and vocational training are in an interdependent relationship because the respective task areas of both overlap partially.

Among others, through the 14 research tasks defined by the German Research Foundation as in 1990 as priority (DFG 1990, p. 67), the field of research on occupation and vocational training covers a variety of topics of vocational pedagogical, vocational didactic and vocational disciplines provenance (DFG 1990, p. 67; Rauner 2005a, p. 105; Sloane 2006, p. 610; Kupka 2006, p. 628; Pahl 2011, p. 714). This does not exclude the possibility, that there might be other independent and specific research fields as well in the long-term.

Viewing the possible research fields and topics of vocational subjects and disciplines as a whole, the question comes up firstly: Which topics belong to which discipline and subject area? There is the issue that vocational didactics of both the vocational pedagogy and vocational disciplines can be classified. Thematic analysis that takes the classification of subjects into account in analytical view should be carried out to define the research areas. The difference between the three research areas can then be seen, that occupation is comprehensively studied in its condition structure and the content of the discipline in vocational discipline research. The research area “vocational pedagogy” focuses on a pedagogy, which

analyzes and studies vocational education and training in particular. The research field “vocational didactics” concentrates on objectives, contents, methods, and media for the training in each specific occupation.

Studies on occupations, occupation classification, and on the understanding of work tasks undertaken out of different motivations, as well as on respective teaching and learning processes in vocational training are important issues. One encounters thematic elements that, on the one hand, focuses more on vocational pedagogy and didactics, and on the other hand, refer to statements that observe the genesis, present and development of vocational training with the work to be performed and the associated subject and specialized areas. This is a very rough localization, because various issues with their elements may show varied and crossed texture. To make the fact more visible and thereby achieving a more precise task assignment, i.e., task definition and to define and work on hitherto neglected areas is an important task of research.

### ***2.3.2 Research on Vocational Pedagogy, Vocational Didactics, and Vocational Disciplines in Narrow and Broad Sense***

#### **2.3.2.1 Research on Vocational Pedagogy**

Research on vocational pedagogy has a long tradition (Arnold and Gonon 2006, p. 127). At present, on the basis of the previous research orientation, it must be stated that the focus is directed to the debate on educational theory, the associated abandonment of a systematic empirical lining of the statements on occupations partially leads to the result that it is built on descriptive analysis and on their own empirically unsupported settlements. For, the foundation of a respective research approach lacks normative and methodological definitions and categories (Lipsmeier 2005, p. 26). Because of this deficit, respective discoverable vocations, the circumstances, the development of the economy, and the education reality are not always adequately measured. Today, it is deplored as deficit particularly, that although vocational pedagogy contains the word “vocation” in its name, the training occupation and their appropriate individual classification are rarely analyzed and observed in depth (Möller and Paulus 2010, p. 11). In the framework of vocational pedagogy, few studies are conducted with regard to the content to be conveyed and skills to be pursued for each occupation so far. Deficit of vocational pedagogy also lies in the fact that the research is almost exclusively focused just on nonacademic occupations and the academic occupations fade out. Because of the deficits recognized not only in vocational pedagogy, it shows that comprehensive research on vocational training is essential.

The debates in current vocational pedagogy focus especially on educational theoretical topics. If one observes their essential research fields, it can be stated

that major issues in the context of vocational education research are social, education-political, and education-theoretical developments, as well as the systematization of this specific form of educational science. Specifically, it comes to the issues of

- Vocational training theory and organizational theory of vocational training (Pätzold 2006a, p. 136),
- Europeanization and internationalization of vocational education and training (George 2005, p. 186; Münk 2006, p. 547),
- Developments in learning and teaching in vocational schools, training enterprises, and employment system (Straka 2005, p. 390; Achtenhagen 2006, p. 586),
- Concepts of professionalism and the associated teaching and learning concepts under the general social frame conditions of technological transition (Huisinga 2005, p. 350; Achtenhagen 2006, p. 586),
- Systematic of vocational training, vocational education, and training in enterprises (Kell 2006, p. 453) and
- Vocational training, especially under social, internalizing, and educational aspects (Bojanowski et al. 2005, p. 396).

Vocational pedagogy can be seen as a specific educational science, which focuses on the issue of sociality, vocational education policy, vocational education theory, vocation, society, pedagogy, and education, and, therefore, does not explicitly focus on each specific occupation. In addition, it applies widely, “that vocational pedagogy particularly endeavors for industrial-technical training programs” (Pätzold 2006b, p. 155). Respective researches focused almost exclusively on nonacademic occupations and related vocational world.

### 2.3.2.2 Vocational Didactic Research

Research on occupation and vocational education is determined particularly by the discussion of whether the development of learning concepts is oriented from vocation or subject, i.e., the scientific discipline. Currently, for the area of vocational didactics, it is noted that the categories used for nonacademic and academic vocational training area are not unified.

Nonacademic area mainly includes vocational work, vocational activity, learning field, activity field, subject area, subject, occupation, and occupation field. The concepts, which can be derived from these categories, include subject didactic (Clement 2006, p. 260), technical didactic (Lipsmeier 2006, p. 281), subject and vocational didactic (Petersen 2011, p. 547), vocational and vocational field didactic, as well as work and subject, i.e., specialized area-oriented didactic approaches (Pahl 2008, p. 359). All these constructs have not yet reached the rank of self-contained didactics or didactic models for the nonacademic vocational training.

Academic educational area is dominated by vocational disciplines and scientific disciplines and subjects. It can be seen as a result that in all these didactic approaches and concepts of teaching, learning and studying, vocations, i.e., vocational content and/or subjects and subject content are mainly used as categorical reference.

The definition of occupation/vocation/profession is not easy and is being discussed controversially. Profession and professionalism represent important categories for didactics of teaching, learning, and studying. Profession is understood generally as a unit for classification of areas or disciplines in science, education, teaching, and study. The development and differentiation of the subject canons of science and learning areas reflects the process of the increasing segregation of individual disciplines. Nature and extent of professionalism is determined by the development and specialization in subareas, but also increasingly by the contents if activities beyond subject area, i.e., cross-curricular.

The terms “vocation/profession”, “discipline,” and “special field of study” are important in university didactics. University didactics can be differentiated into general and domain-specific didactics. It requires “a scientific didactics and becomes discipline-specific university didactics through this focus. Each school didactics has its associated university domain didactics” (Grammes 2009, p. 3).

Today, the term “vocation” (Beruf) combines several interpretation possibilities. In general, it includes function, tasks, and activities of labor-division structures that is almost universal in the employment system as well as other social assignments and responsibility (Dostal 2005a, p. 106). For didactic considerations for vocational teaching and learning, occupation or occupation field can be taken into account. The work and activity field created in the process can and should be taken as the basis for relative vocational didactics. The didactic research should focus on relevant training occupation and vocational field, identify “the commonalities of training occupation allocated to a occupation” (Grüner 1981, p. 543). Due to the large number of training occupations, it seems that an integrated development of specific vocational didactics is not feasible in the foreseeable future—mainly because of the lack of human and material resources. From the perspective of what can be done, it comes back to occupation fields in order to generate relevant vocational field didactics.

As theoretical constructs of vocational teaching, learning, and studying, didactics have the problem in general—even when they are arranged differentially, that they do not or at least not adequately capture the vocational reality. This is a general epistemological issue. During the development of didactic theory of vocational teaching, learning, and studying, there is additional risk that, because of the limitation on a category such as occupation, vocational work, discipline, and subject area, only a reduced and simplified image of what happens in reality in the professional and personal life is presented. Under certain circumstances, the superior educational thought of the connection of vocational training and general education may be lost. It seems reasonable not to start merely from an initial point, i.e., a category in the development of vocational didactics. The categories “vocation” and “discipline”, for example, can be combined, so the limitations that

may occur with exclusive focus on a single category can be dissolved with such an approach. To illustrate and describe this approach adequately, vocational and discipline didactics are now referred to in the area of vocational education. It is reflected in the discussions in recent years, that a close relationship has been seen between the terms “vocation” and “discipline” in didactic discourse on vocational teaching and learning (Schütte 2006, p. 140). With a didactic concept of vocational teaching, which also takes the systematic of the discipline—when it is possible and appropriate—into consideration, besides occupation and occupation field. With this connection, the reality is better reflected than with only one basic category as the reference point for didactics.

### 2.3.2.3 Vocational Discipline Research

The concept of vocational discipline can be interpreted and differentiated in a broad sense and in a narrow sense. For vocational discipline the broad sense as “theory of vocation,” i.e., the teaching and research on vocations, the themes, and phenomena that occur in connection with occupations are comprehensively observed, and for example, when the overall necessary vocational knowledge of teachers in the vocational training centers is studied. In the context of vocational education research, vocational discipline in the narrow sense focuses merely on the theory and practice of the subject contents and the related work of each specific occupation.

The necessity, as already demonstrated earlier, to combine vocational work and discipline, i.e., subject area or technique under the aspect of education (Rauner 1987, p. 116; Pahl 1993, p. 52, 1998c, p. 7) as a fundamental approach has been clarified and developed (Becker and Spöttl 2008). A deeper understanding of vocational discipline considerations and of the importance of occupation research for vocational training has been developed in discourse between professional representatives, particularly from industrial-technical disciplines. The vocational discipline research in recent years is marked by the orientation on work processes in company (Jenewein 2005, p. 148) and vocational or job-related action competences (Rauner 2004; Rauner et al. 2007). The orientation of vocational education and qualification on work processes is schematized and discussed, taking the subjective individual interests, experiences, and requirements of the learners and professionals into consideration. Work, professional field, or subject area and vocational training are interdependent in their relationship to the subject of vocational discipline research. On this basis, vocational educators should be empowered during their training to shape vocation-related educational processes and qualifying working processes.

However, whether the learning processes in the employment system “can be very effective for the work force under the current structures and conditions of vocational work, must be doubted despite or better because of the pressure exerted; much more likely would be that they [the employees of generality] are pressed into

a working and living situation that is highly unfavorable for the competence development” (Volpert 2005, p. 298).

Due to these developments, a change of perspective for vocational learning and working processes has stood out. The state of development of vocational discipline in individual domains, i.e., occupations fields varies widely. For many areas, for the preparation of the contents of vocational learning, the necessity to develop a qualification research proves to be meaningful and necessary. The specialized areas may be the subject of an integrative changing relation of vocational training that includes work and specialized area in their concrete shaping as interaction of the technical possibility and social desires.

Currently, the vocational discipline research is mainly about the uncovering of the contents and forms of factors, moments, and forces that shape organized labor in vocational form. The relevant occupation field or specialized area is presented not only as an independent variable, but is also observed in its configurability and in conjunction with the shaping of work and working process, as well as the typical professional working competences. Knowledge on working process and work competences, i.e., vocational qualifications become the key categories of the theoretical and empirical research (Rauner 2004; Rauner et al. 2007; Becker and Spöttl 2008). Relevant approaches of vocational disciplines must be applied comprehensively because of their requirements. For some time, the specific occupation-related objectives, contents, and forms of work and the related work processes are explored particularly in this context (Becker and Spöttl 2008). The issue of reference discipline still has not been solved optimally for many occupations stands in the focus of research. Such research approaches are followed largely unsystematically and incoherently. They are a prerequisite and an option for a more systematic and complex scientific foundation of vocational education research.

Vocational discipline research in each occupation represents a complex, demanding, and time- and resource-consuming task. Due to the number of acknowledged training occupations (currently 344, BIBB 01.08.2011), it is unrealistic to develop an independent research plan or vocational discipline for each occupation. A further designed research and development approach based on the existing structure of the “occupation fields” is more realistic and meaningful. Structural elements of such a vocational field discipline are the occupation field research and teaching. Central task of a vocational field discipline is to investigate the vocational action field of each occupation of an occupation field, as well as the evaluation and shaping possibilities of work-specific working processes and the technology used in (vocational) educational and above all (vocational) didactic aspects. Due to the lack of theoretical foundation and grounding for traditional definition and description of occupation fields and various classification criteria, the construct order of “occupation field” must be critically examined and analyzed.

Previous approaches to vocational field discipline indicate that this may focus, on the one hand, on overarching questions of occupation field, and on the other hand, on the basic areas of vocational discipline. In this respect, one can call vocational field discipline as a precursor or precondition of vocational discipline in the strict sense. The greater the complexity of the evolving vocational field

discipline is in the context of work, technique, and education in occupation field, the more varied is the spectrum of possibilities to respond to the changes in the work and living world, without losing itself in the specific details of a occupation.

Work and business processes provide a specific area of vocational and vocational field discipline research. Fischer (2005, p. 307) correctly states that, with the term “work process knowledge,” the “work-oriented change in the vocational training has moved to the foreground.” In vocational training, it has been tried “to structure the ways of the acquisition of working process knowledge based on curricula by newer reform approaches” (Fischer 2005, p. 315). However, an explicit definition of knowledge in vocational discipline research is still absent (Röben 2005, p. 253). A reasoned and conceptual distinction between scientific knowledge, book knowledge, theoretical knowledge, practical knowledge, and work process knowledge has not yet been formed (Röben 2005, p. 253). This finding also applies to the discussion on the work process knowledge and business process knowledge. There seems to be no doubt that, with the orientation on work and business processes, a significant step can be made to competence development.

When observing vocational discipline and/or vocational field discipline, one must reflect on the respective work processes from two sides: the process is viewed from the outside, whereby its function and elements are highlighted; from the inside, it is seen from the perspective of the individual who is involved in the vocational work. Due to the current problematic developments in the field of vocational work, it must be noted that the individual employee should be observed with their individual requirements, experience, and requirements in a comprehensive education. An important aspect is the question of “how much can particular job arrangement, i.e., work organization influence individual learning and developing opportunities” (Volpert 2005, p. 294).

The new research approaches and results in interdisciplinary analyzes of and studies on vocational discipline make it clear that, through advanced and multi-dimensional organizational forms, work tasks and activities in the workplace raise other and/or increase demands on vocational learning and work processes, and thus also on the learners. In some new work forms of the employment system, one can speak “of a ‘requirement for excessive requirement’ under learning-relevant aspects, while this is more like a ‘requirement for (qualitative) lower requirement’ in traditional Taylorism working structures” (Volpert 2004, p. 299). Not only learning in training enterprise, i.e., in the workplace, but also schools that provide vocational education at the learning place are affected by this paradigm shift.

## **2.4 Future Tasks and Perspectives of Occupation Research and Research on Vocational Education**

### ***2.4.1 Development Opportunities of Vocational Didactics on the Basis of Vocational Discipline***

The further development of vocational (field) discipline will also present an important task for vocational (field) didactics in the context of on vocational education research in the future. During the study on a topic of vocational learning through the analysis of work and domain, i.e., subject area under the aspect of vocational training, teachers in nonacademic and academic vocational training institutions can also contribute to vocational discipline that shapes itself for individual occupations.

Different from the research on vocational discipline, which is still in the early phase, various research results have been produced in the field of didactics of vocational teaching, learning, and studying. It can be tried to push forward a systematic vocational didactic research in nonacademic, as well as in academic vocational education area, which is not limited to the occupation, occupation field, and disciplines, but also focus on occupation-related work and associated work processes.

As vocational didactic research can only be found at the moment relatively rarely and only for some selected topics or occupations, and the outcomes of the research on vocational didactics are only available occasionally, future research should be conducted in particular on the following two levels to a greater extent:

- Expansion of the occupation and vocational training research on as many occupations and occupation fields as possible.
- Research on higher level vocational education theory and the possibility of an overall didactic concept for the nonacademic and academic vocational education.

Although the development of vocational disciplines and the related occupation and vocational education research seems to be a long-term goal under the current conditions and limited resources, yet or just therefore, vocational didactic and vocational discipline research should be conducted and brought forward in the future. Any teacher, whether working in nonacademic or academic area, can contribute to this future project on site with their educational-, teaching-, or study-related analyzes of the discipline or associated vocational work.

Occupation and vocational education research also represents a major work field in the future. If one reflects on the current situation more closely, a variety of didactic approaches to vocational teaching and learning can be recognized, regardless of whatever they are called. Not only their number is very large, they are also shaped extremely differently. The spectrum reaches from self-produced simple and relatively plain concepts to elaborated constructs that are based on very

in-depth scientific discussion. The number of vocational didactics will be even larger in the foreseeable future, if one follows the banal insight, that specific didactics of vocational teaching, learning and should be researched, developed, and applied in all areas as much as possible where vocational training takes place. Therefore, both the area of nonacademic vocational education and training and the area of teaching at academic institutions must be considered. The latter is in the current practice usually not classified to the vocational training system, but declared as (independent) higher education system. Considering under system-theoretical aspects, vocational training also prospers in academic teaching and didactic approaches, vocational didactics has already been developed for academic occupation, which should/must be further shaped in the future. Perspectively, emerged and still existing view constriction of occupational and vocational education-related researches on the nonacademic vocational training and its didactics will be broken up and broadened.

Gustav Grüner has repeatedly pointed out three decades ago that there should be long-term specific didactics in vocational education. Under the perspective that didactic principles and corresponding concepts must be researched in both academic and nonacademic vocational education system, the thesis seems appropriate that the previously presented concepts to didactics of vocational teaching and learning are transferable to the entire area of vocational education, and this extended approach can contribute to the development and creation of a overriding theory of vocational didactics. Occupational and vocational education research must then start from an entire vocational education system, which though consists of two partially independent subsystems (nonacademic and academic vocational training system), indicates an overriding didactics among many specific occupation fields.

#### ***2.4.2 Prospects for the Subjects and Disciplines Through Occupation Research and Research on Vocational Education***

Viewing the subjects and disciplines, occupation research, and research on vocational training have developed from preforms to a more empirically oriented research on vocational science with a particular task profile in the course of the last 100 years.

Previous vocational scientific work in nonacademic and academic vocational education area has led to the recognition that it is reasonable and necessary to consider specific research approaches in vocational education research. Fundamental work areas and tasks of vocational discipline and vocational didactic research have been identified (Rauner 2002a, b), but it is almost exclusively related to nonacademic subjects and disciplines so far.

Vocational discipline researches should be directed primarily to occupations, vocational work, and work and business processes and their organization possibilities in the future, namely in detail to

- Historical and current forms and future developments of vocational work and work and business processes in the corresponding nonacademic and academic occupations.
- Analyses of qualification requirements in vocation, and together with the requirements for vocational learning or studying for an occupation.
- Analyses of subject areas that are relevant to the vocation-specific work in a occupation field.
- Innovation fields from vocation-related specialized or subject area and work fields.
- Occupation, occupation profiles, and concepts for restructuring the existing occupations.
- Concepts for initial and further education and training of teachers in vocational disciplines.

Focuses of vocational didactic and methodological researches are

- Necessary functions, structures, and forms of nonacademic and academic training of the future,
- Training and learning organization (legal, structural and organizational framework, regulatory instruments, curricula, training regulations/training frame plans, study plans),
- Didactics, methodology, and media of vocational teaching, learning, and studying (e.g., action-oriented and differentiated training, teaching and learning concepts, i.e., learning and studying organization, learning results controls).

If these and other research tasks are tackled in the future, occupation and vocational education research will see a remarkable development, that may have great importance not only for the employment system but also for the social system overall.

## **2.5 Occupation and Vocational Education Research in the Educational Political Sense: Conclusion**

For nonacademic and academic vocational education as well as its vocational subjects and disciplines, both the results of occupation research and research on vocational education are becoming increasingly important. In the sense of the overall concern of a result-oriented research, it could be decided respectively with selected important major topic areas, such as vocational subjects and vocational disciplines, whether they should be worked on separately or together.

The opening question in this study focuses on how occupation and vocational education research has been developed in the past and at the present, and what their future prospects look like. It was based on the assumption that there are various independent and common work and research areas. When assessing the areas of occupation research and research on vocational training, and the related research areas of vocational pedagogy, vocational didactics and vocational discipline, a reasonable and appropriate definition of the relevant research subjects insures well-based analysis and study, for example, of vocational subjects and disciplines, and thus a more realistic perspective on these research subjects.

A comprehensive and systematic occupation and vocational education research can significantly contribute to the development of vocational subjects and disciplines with their results. For each area of vocational education research, i.e., vocational pedagogy and vocational didactics, as well as vocational discipline, specific research fields should be gut-covered. The research fields worked on under various perspectives and their results could also lead to synergy effects for the disciplines associated with vocational education. Overall, it could be assumed that occupation and vocational education research—as can be seen by viewing the historical and current development—will experience growing importance in the future, whose concrete consequences for both the employment system and the social system overall could not be estimated at the present.

## References

- Abel, H. (1963). *Das Berufsproblem im gewerblichen Ausbildungs- und Schulwesen Deutschlands (BRD). Eine Untersuchung.* Braunschweig: Westermann.
- Achtenhagen, F. (2006). Lehr-Lern-Forschung. In R. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung*. 2. Aufl., Wiesbaden: VS Verlag für Sozialwissenschaften, S. 586–609.
- Arnold, R., & Gonon, P. (2006). *Einführung in die Berufspädagogik.* Opladen & Bloomfield Hills: Verlag Barbara Budrich.
- Bähr, W. H., & Holz, H. (Hg.). (1995). *Was leisten Modellversuche?* Berlin/Bonn: IFA.
- Becker, M., Hitz, H., Rauner, F., & Spöttl, G. (2002). *Wissenschaftliche Begleitung zur Neuordnung der fahrzeugtechnischen Berufe: Aufgabenanalyse für die Neuordnung der Berufe im Kfz-Sektor. Abschlussbericht.* Bremen: Universität Bremen. [www.itb.uni-bremen.de](http://www.itb.uni-bremen.de)
- Becker, W., & Meifort, B. (2004). *Ordnungsbezogene Qualifikationsforschung als Grundlage für die Entwicklung beruflicher Bildungsgänge.* In F. Rauner (Hg.), *Qualifikationsforschung und Curriculum. Analysieren und Gestalten beruflicher Arbeit und Bildung.* Reihe: Berufsbildung, Arbeit und Innovation, Bd. 25, Bielefeld: Bertelsmann, S. 45–59.
- Becker, W., & Spöttl, G. (2008). *Berufswissenschaftliche Forschung.* Frankfurt a. M.
- Bojanowski, A., Eckardt, P., & Ratschinski, G. (2005). *Benachteiligtenforschung.* In F. Rauner (Hg.), *Handbuch Berufsbildungsforschung.* Bielefeld: Bertelsmann, S. 396–403.
- Bonz, B. (1980). *Individuelle und gesellschaftliche Ansprüche im Technikunterricht.* In B. Bonz & A. Lipsmeier (Hg.), *Allgemeine Technikdidaktik—Bedingungen und Ansätze des Technikunterrichts.* Stuttgart: Holland + Josenhaus, S. 61–73.
- Bonz, B. (1995). *Methoden in der schulischen Berufsbildung.* In A. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung.* Opladen: Leske + Budrich, S. 271–282.
- Bonz, B., & Ott, B. (Hg.). (1998). *Fachdidaktik des beruflichen Lernens.* Stuttgart: Steiner.

- Botsch, R. (1980). Lehrbuch, Merkblatt und Arbeitsblatt als Hilfsmittel wirtschaftlicher Unterrichtsdurchführung [1927]. Auszug. In: Quellen und Dokumente zur Geschichte der Berufsbildung in Deutschland. Band 2A: Quellen und Dokumente zur schulischen Berufsbildung 1918–1945. Hrsgg. von K. Kümmel. Köln, & Wien: Böhlau, S. 127–132.
- Botsch, R., Bürgener, W., & Glunz, F. (1950). Methodik des Fachzeichnenunterrichts für Maschinenbauer. Teil 1, Zweiter Abschnitt: Bemerkungen zur Unterrichtsarbeit, Modelle, Musteraufnahmen, Lösungen für die Arbeitsblätter, Abwicklungen, Umklappungen, Verstreckungen von Werkstücken. Weinheim.
- Buchmann, U. (1999). Die akademische Berufsausbildung aus der Sicht von Parteien – Eine empirisch-sprachanalytische Studie zur Hochschulpolitik in Parteienprogrammen. Siegen.
- Buchmann, U. (2002). Kooperation als erster Schritt zur Wissensintegration. Die pädagogische Herausforderung moderner Gesellschaften? Siegen (siehe auch: [www.bwpat.de/ausgabe3/buchmann\\_bwpat3.shtml](http://www.bwpat.de/ausgabe3/buchmann_bwpat3.shtml))
- Clement, U. (2006). Curricula für die berufliche Bildung—Fächersystematik oder Situationsorientierung? In R. Arnold & A. Lipsmeier (Hg.), Handbuch der Berufsbildung. 2. Aufl., Wiesbaden: VS Verlag für Sozialwissenschaften, S. 260–268.
- DFG—Deutsche Forschungsgemeinschaft. (1990). Berufsbildungsforschung an den Hochschulen der Bundesrepublik Deutschland. Situation, Hauptaufgaben, Förderungsbedarf. Denkschrift. Hrsgg. von der Senatskommission für Berufsbildungsforschung Weinheim u. a.: VCH. Acta Humaniora.
- Dilthey, W. (1961). Über die Möglichkeit einer allgemeingültigen pädagogischen Wissenschaft [1888]. Weinheim: Beltz.
- Dörpfeld, F. W. (1962). Schriften zur Theorie des Lehrplans. Hrsgg. von Alfred Reble. Bad Heilbrunn/Obb.
- Dörpfeld, F. W. (1973). Grundlinien einer Theorie des Lehrplans [1903]. Gütersloh: Bertelsmann.
- Dostal, W. (2005a). Berufsforschung. In F. Rauner (Hg.), Handbuch Berufsbildungsforschung. Bielefeld: Bertelsmann, S. 105–112.
- Dostal, W. (2005b). Berufsforschung. Beruf als Forschungsgebiet des Instituts für Arbeitsmarkt und Berufsforschung (IAB) von 1967 bis 2003. Nürnberg: Institut für Arbeitsmarkt und Berufsforschung der Bundesagentur für Arbeit.
- Elbers D. (1973). Curriculumreformen in den USA: Ein Bericht über theoretische Ansätze und praktische Reformverfahren mit einer Dokumentation. Berlin: Max-Planck-Institut für Bildungsforschung.
- Euler, D., Walwei, U., & Weiß, R. (Hg.) (2010). Berufsforschung für eine moderne Berufsbildung—Stand und Perspektiven. Stuttgart: Franz Steiner.
- Fischer, M. (2005). Arbeitsprozesswissen. In F. Rauner (Hg.), Handbuch Berufsbildungsforschung. Bielefeld: Bertelsmann, S. 307–315.
- Gagel, G. (1929). Der Fachunterricht in der Maschinenbauoberklasse. In Die kleine Berufsschule, Heft 2, 1928/1929. Zugleich Leipzig/Berlin.
- Geißler, L. (1992). Methodik des gewerblichen Zeichnens in der Berufsschule [1941]. In G. Pätzold (Hrsg.), Berufsschuldidaktik in Geschichte und Gegenwart: Richtlinien, Konzeptionen, Reformen. Bochum, S. 233–253.
- Georg, W., & Kunze, A. (1981). Sozialgeschichte der Beruferziehung. München: Juventa.
- Georg, W. (2005). Vergleichende Berufsbildungsforschung. In F. Rauner (Hg.), Handbuch Berufsbildungsforschung. Bielefeld: Bertelsmann, S. 186–193.
- Gerds, P., Heidegger, G., & Rauner, F. (1998). Reformbedarf in der universitären Ausbildung von Pädagoginnen und Pädagogen beruflicher Fachrichtungen in Norddeutschland. Gutachten im Auftrag der norddeutschen Länder. Bremen: Universität Bremen.
- Gilbreth, F. B. (1911). *Motion study*. New York: Van Nostrand.
- Glunz, F. (1962). Das Berufsschullaboratorium für metallgewerbliche Klassen. Studien zur Berufspädagogik, Heft 7. Weinheim/Bergstr.: Verlag Julius Beltz.
- Grammes, T. (2009). Editorial: Ausbildungsdidaktiken—Themen und Aufgaben einer Hochschuldidaktik der Sozialwissenschaften in der Lehrerbildung. In: Journal of Social Science Education, Volume 8, Number 2, S. 2–22.

- Grüner, G. (1967). Die didaktische Reduktion als Kernstück der Didaktik. In: Die Deutsche Schule, 59. Jg., Heft 7/8, S. 414–430, Grüner.
- Grüner, G. (1970). Der Fachbereich Berufspädagogik in der Gesamthochschule. Vorschläge für seine Verwirklichung. In: Die Deutsche Berufs- und Fachschule (DtBFsch), Bd. 66, Heft 6, S. 441–450.
- Grüner, G. (1975). Einführung. In G. Grüner (Hrsg.), Curriculumproblematik der Berufsschule. bzp 6. Stuttgart, S. 7–23.
- Grüner, G. (1981). Didaktik des Ausbildungsberufes? In ZBW, Bd. 77, Nr. 7, S. 543–547.
- Hauptmeier, G., Kell, A., & Lipsmeier, A. (1975). Zur Auswahlproblematik von Lerninhalten und zur didaktischen Reduktion wissenschaftlicher Aussagen. In: Die Deutsche Berufs- und Fachschule, 71. Band, Heft 12, S. 899–920.
- Hass, J. (1980). Fachdidaktische Aspekte einer lehrorientierten Fachwissenschaft. In Berufliche Bildung und Lehrerbildung im Berufsfeld “Metalltechnik”. Bremen: Universität Bremen.
- Hering, D. (1958). Didaktische Vereinfachung. Habil. Schrift. Fakultät für Berufspädagogik. Dresden: TH Dresden
- Hering, D. (1959). Zur Faßlichkeit naturwissenschaftlicher und technischer Aussagen. Berlin (Ost): Volk und Wissen Volkseigener Verlag.
- Herkner, V. (2003). Deutscher Ausschuß für Technisches Schulwesen. Untersuchungen unter besonderer Berücksichtigung metalltechnischer Berufe. Hamburg: Kovac.
- Hoffmann, K.-H. (1966). Die berufswissenschaftliche Forschung stärken. In Berufsbildung, 20. Jg., Heft 11, S. 534–536.
- Hoppe, M. (1990). Arbeitsgemeinschaft der Hochschulinstiut für gewerblich-technische Berufsbildung (HGTB) gegründet. In ZBW, Bd. 86, Nr. 4, S. 377–378.
- Horn, W. (1996). Lehre der Elektrotechnik—Entwicklungslinie einer Fachdidaktik. In A. Lipsmeier & F. Rauner (Hg.), Beiträge zur Pädagogik für Schule und Betrieb. Stuttgart: Holland + Josenhans, S. 7–21.
- Howe, F. (2001). Die Genese der Elektroberufe. Diss. Bremen: Universität Bremen.
- Huisinga, R. (2005). Curriculumforschung. In F. Rauner (Hg.), Handbuch Berufsbildungsforschung. Bielefeld: Bertelsmann, S. 350–357.
- von Humboldt, W. (1964). Schriften zur Politik und zum Bildungswesen. Werke in fünf Bänden. Herausgegeben von A. Flitner und K. Giel, Band IV. Stuttgart.
- Jenewein, K. (2005). Elektrotechnik/Informatik. In F. Rauner (Hg.), Handbuch Berufsbildungsforschung. Bielefeld: Bertelsmann, S. 142–150.
- Kahlke, J., & Kath, F. M. (Hg.). (1984). Didaktische Reduktion und methodische Transformation. Alsbach: Leuchtturm Verlag.
- Kell, A. (2006). Organisation, Recht und Finanzierung der Berufsbildung. In R. Arnold & A. Lipsmeier (Hg.), Handbuch der Berufsbildung. 2., überarb. und akt. Aufl., Wiesbaden: VS Verlag für Sozialwissenschaften, S. 453–485.
- Kerschensteiner, G. (1965). Begriff der Arbeitsschule [1912]. 16. Aufl., München u. a.: Oldenbourg.
- Kirschner, O. (1971). Zum Problem der didaktischen Reduktion ingenieur- und naturwissenschaftlicher Aussagen. In Die Deutsche Berufs- und Fachschule, 67. Band, S. 26.
- Kleiner, M., Rauner, F., Reinhold, M., & Röben, P. (2002). Curriculumdesign I. Arbeitsaufgaben für eine moderne Beruflichkeit. Identifizieren und Beschreiben von beruflichen Arbeitsaufgaben. Vorabdruck aus der Reihe: Berufsbildung und Innovation—Instrumente und Methoden zum Planen, Gestalten und Bewerten. Bd. 2. Konstanz: Christiani.
- Krause, E. (1962). Die Arbeits- und Berufsanalyse und ihre Bedeutung für die Berufsschule. In: Die berufsbildende Schule, 14. Jg., Heft 4, S. 259–263.
- Kuhlmeier, W., & Uhe, E. (1992). Aufgaben und Wirkungsfelder der beruflichen Fachdidaktiken. In: Berufsbildung, 46. Jg., Heft 15, S. 128–131.
- Kupka, P. (2006). Arbeitsmarkt- und Berufsforschung. In R. Arnold & A. Lipsmeier (Hg.), Handbuch der Berufsbildung. 2., überarb. und akt. Aufl., Wiesbaden: VS Verlag für Sozialwissenschaften, S. 628–640: 1965.

- Lipsmeier, A. (1995). Didaktik gewerblich-technischer Berufsbildung (Technikdidaktik). In R. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung*. Opladen: Leske + Budrich, S. 230–244.
- Lipsmeier, A. (2005). Genese der berufspädagogischen Forschung. In F. Rauner (Hg.), *Handbuch Berufsbildungsforschung*. Bielefeld: Bertelsmann, S. 19–27.
- Lipsmeier, A. (2006). Didaktik gewerblich-technischer Berufsbildung (Technikdidaktik). In R. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung*. Wiesbaden: VS Verlag für Sozialwissenschaften, S. 281–298.
- Martin, W., Pangalos, J., & Rauner, F. (2000). Die Entwicklung der Gewerblich-Technischen Wissenschaften im Spannungsverhältnis von Technozentrik und Arbeitsprozessorientierung. In J.-P. Pahl, F. Rauner & G. Spöttl (Hg.), *Berufliches Arbeitsprozesswissen. Ein Forschungsgegenstand der Berufsfeldwissenschaften*. Baden-Baden: Nomos, S. 13–30.
- Mausolf, W., & Pätzold, G. (1982). *Planung und Durchführung beruflichen Unterrichts. Eine praxisorientierte Handreichung*. Essen: Girardet.
- May, H. (1978). *Arbeitslehre. Wirtschaftswissenschaftliche und Wirtschaftsdidaktische Grundlagen*. München/Basel: Reinhard.
- Möhlenbrock, R. (1979). *Modellbildung und Didaktische Transformation*. Diss., Hamburg: Universität Hamburg.
- Möller, F. (1951a). *Unterrichtslehre für Berufsschulen*. Braunschweig/Berlin/Hamburg/Kiel.
- Möller, F. (1951b). *Berufsschul-Methodik Metallgewerbe*. Braunschweig/Berlin/Hamburg/Kiel.
- Möller, J., & Paulus, W. (2010). Perspektiven einer modernen Berufsforschung. In D. Euler, U. Walwei & R. Weiß (Hg.), *Berufsforschung für eine moderne Berufsbildung – Stand und Perspektiven*. Stuttgart; Franz Steiner, S. 11–35.
- Monsheimer, O. (1956). *Drei Generationen Berufsschularbeit*. Gewerbliche Berufsschulen. Weinheim: Beltz.
- Müllges, U. (1975). Berufstatsachen und Erziehungsaufgabe—Das Grundproblem einer Berufspädagogik als Wissenschaft. In: *Die Deutsche Berufs- und Fachschule (DtBFsch)*, Bd. 71, Heft 11, S. 803–820.
- Münk, D. (2006). Berufliche Aus- und Weiterbildung in Europa. In R. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung*. Wiesbaden: VS Verlag für Sozialwissenschaften, S. 547–560.
- Nashan, R., & Ott, B. (1990). *Unterrichtspraxis Metalltechnik/Maschinentechnik. Didaktisch-methodische Grundlagen für Schule und Betrieb*. Bonn: Dümmler.
- Nickolaus, R. (2006). *Didaktik—Modelle und Konzepte beruflicher Bildung*. Baltmannsweiler: Hohengehren.
- Ott, B. (2011). *Grundlagen des beruflichen Lernens und Lehrens. Ganzheitliches Lernen in der beruflichen Bildung*. Berlin.
- Pahl, J.-P. (1993). Fachdidaktiken ohne Berufswissenschaften. Ein Kernproblem beruflichen Lernens. In *Berufsbildung*, 47. Jg., Heft 19, S. 52–53.
- Pahl, J.-P. (1998a/2000). Bausteine beruflichen Lernens im Bereich Technik. Teil 2: Methodische Konzeptionen für den Lernbereich Technik. 1./2. Aufl., Alsbach: Leuchtturm.
- Pahl, J.-P. (1998b). Berufsfelddidaktik zwischen Berufsfeldwissenschaft und Allgemeiner Didaktik. Alte Restriktionen – neue Optionen in der Metall- und Maschinentechnik. In B. Bonz & B. Ott (Hg.), *Fachdidaktik des beruflichen Lernens*. Stuttgart: Steiner.
- Pahl, J.-P. (1998c). *Instandhaltung. Arbeit – Technik – Bildung*. Seelze-Velber: Kallmeyer.
- Pahl, J.-P. (2005). Zur Genese berufswissenschaftlicher und berufsdidaktischer Forschung. In F. Rauner (Hrsg.), *Handbuch Berufsbildungsforschung*. Bielefeld, S. 27–35.
- Pahl, J.-P. (2008). *Berufsschule, Annäherungen an die Theorie eines Lernortes*, 2. Auflage, Bielefeld.
- Pahl, J.-P. (2011). Fachschulen für Technik—Entwicklung von zweigliedrigen zu eingliedrigen beruflichen Weiterbildungseinrichtungen. In N. Fischer, & A. Grimm (Hrsg.), *Lernen und Lehren in der beruflichen Bildung. Professionalisierung im Spannungsfeld von Hochschule und Schule*. Frankfurt am Main u. a.: Peter Lang.

- Pahl, J.-P., & Herkner, V. (Hg.). (2010). *Handbuch Berufliche Fachrichtungen*. Bielefeld: Bertelsmann.
- Pätzold, G. (1993). *Lehrmethoden in der beruflichen Bildung*. Heidelberg: Sauer.
- Pätzold, G. (2006a). Berufsbildungstheorie. In F.-J. Kaiser & G. Pätzold (Hg.), *Wörterbuch Berufs- und Wirtschaftspädagogik*. 2. Auf., Julius Klinkhardt: Bad Heilbrunn, S. 136–139.
- Pätzold, G. (2006b). Berufspädagogik. In F.-J. Kaiser & G. Pätzold (Hg.), *Wörterbuch Berufs- und Wirtschaftspädagogik*. 2. Auf., Julius Klinkhardt: Bad Heilbrunn, S. 155–158.
- Ploghaus, G. (2001). Innovationen in beruflichen Schulen durch Modellversuche. In *BWP*, 30. Jg., Heft 2, S. 12–17.
- Ploghaus, G. (2003). *Die Lehrgangsmethode in der berufspraktischen Ausbildung: Genese, international Verbreitung und Weiterentwicklung*. Bielefeld: W. Bertelsmann
- Rauner, F. (1987). *Elektrotechnik Grundbildung. Curriculumentwicklung in Nordrhein-Westfalen*. Soest: Soester Verlagskontor.
- Rauner, F., Spöttl, G., Olesen, K., & Clematide, B. (1993). *Beschäftigung, Arbeit und Weiterbildung im Europäischen Kfz-Handwerk. Studie im Rahmen des FORCE-Programmes*. Bremen: Universität Bremen.
- Rauner, F. (1998b). Zur methodischen Einordnung berufswissenschaftlicher Arbeitsstudien. In J.-P. Pahl & F. Rauner (Hg.), *Betrifft: Berufsfeldwissenschaften. Beiträge zur Forschung und Lehre in den gewerblich-technischen Fachrichtungen*. Bremen: Donat.
- Rauner, F. (2002a). Berufswissenschaftliche Forschung—Implikationen für die Entwicklung von Forschungsmethoden. In M. Fischer & F. Rauner (Hg.), *Lernfeld: Arbeitsprozess*. Baden-Baden: Nomos, S. 443–476.
- Rauner, F. (2002b). Qualifikationsforschung und Curriculum. In M. Fischer & F. Rauner (Hg.), *Lernfeld: Arbeitsprozess*. Baden-Baden: Nomos, S. 317–339.
- Rauner, F. (2004). *Praktisches Wissen und berufliche Handlungskompetenz*. ITB Forschungsberichte 14. Bremen: Universität Bremen.
- Rauner, F. (Hg.). (2005a). *Handbuch Berufsbildungsforschung*. Bielefeld: Bertelsmann.
- Rauner, F. (2005b). Berufsbildungsforschung—Eine Einführung. In F. Rauner (Hg.), *Handbuch Berufsbildungsforschung*. Bielefeld: Bertelsmann, S. 9–16.
- Rauner, F., & Spöttl, G. (1995). Entwicklung eines europäischen Berufsbildes “Kfz-Mechatroniker” für die berufliche Erstausbildung unter dem Aspekt der arbeitsprozeßorientierten Strukturierung der Lehr-Inhalte. ITB-Arbeitspapiere 13, Bremen: Universität Bremen ITB.
- Rauner, F., Grollmann, P., & Martens, T. (2007). *Messen beruflicher Kompetenz (entwicklung)*. ITB Forschungsberichte 21. Bremen: Universität Bremen.
- Rein, W. (1908). *Pädagogik im Grundriss*. Leipzig.
- Rein, W. (1952). Theorie des Lernverfahrens [1893]. In G. Geißler: *Das Problem der Unterrichtsmethode*. Weinheim, S. 29–34.
- Reinhold, M., Haasler, B., Howe, F., Kleiner, M., & Rauner, F. (2003). *Curriculumdesign II. Entwickeln von Lernfeldern. Von beruflichen Arbeitsaufgaben zum Berufsbildungsplan*. Konstanz: Christiani.
- Röben, P. (2005). Kompetenz- und Expertiseforschung. F. Rauner (Hg.), *Handbuch Berufsbildungsforschung*. Bielefeld: Bertelsmann, S. 247–254.
- Roesler, R. (1913). Vorwort: Das Taylor-System – Eine Budgetierung der menschlichen Kraft. In F. W. Taylor (Hg.), *Die Grundsätze wissenschaftlicher Betriebsführung*. München/Berlin: Oldenbourg, S. 7–20.
- Schad, E. (1977a). *Das technische Problem und seine didaktische Funktion im Berufsschulunterricht*. Konstanz: Leuchtturm.
- Schad, E. (1977b). *Hydraulik: ein Lerninhalt zur Vermittlung extrafunktionaler Qualifikationen*. In die berufsbildende Schule, 29. Jg., Heft 6, S. 370–382.
- Schmale, W. (1967). *Die Frankfurter Methodik. Eine informative Gesamtschau*. In *Die Deutsche Berufs- und Fachschule*, 63. Band, Heft 3, S. 204–214.
- Schütte, F. (2006). *Berufliche Fachdidaktik: Theorie und Praxis der Fachdidaktik Metall- und Elektrotechnik*. Ein Lehrbuch. Stuttgart: Steiner.
- Seymour, W. D. (1960). *Verkürzung der Anlernzeit*. Berlin u. a.: Beuth.

- Sloane, P. F. E. (2006). Berufsbildungsforschung. In R. Arnold & A. Lipsmeier (Hg.), *Handbuch der Berufsbildung*. 2., überarb. und akt. Aufl., Wiesbaden: VS Verlag für Sozialwissenschaften, S. 610–627.
- Spöttl, G. (2000). Der Arbeitsprozess als Untersuchungsgegenstand berufswissenschaftlicher Forschung und die besondere Rolle von Experten(-Facharbeiter-)workshops. In J.-P. Pahl, F. Rauner & G. Spöttl (Hg.), *berufliches Arbeitsprozesswissen. Ein Forschungsgegenstand der Berufswissenschaften*. Baden-Baden: Nomos, S. 205–222.
- Stein, W. L. (1958). Experimentelle Werkkunde für Berufsschulen (Maschinenbau). In *Berufspädagogische Beiträge der Pädagogischen Zeitschrift (BPZ)*, Heft 6, Hamburg: Westermann.
- Stein, W. L. (1965). *Experimentelle Werkkunde für Berufsschulen (Maschinenbau)*, 2nd ed. Hamburg: Westermann.
- Stein, W. L. (1983). Das Experiment in der Unterrichtspraxis beruflicher Schulen. In *Die berufsbildende Schule (BbSch)*, 35 Jg., Heft 9, S. 502–520.
- Straka, G. A. (2005). Die KMK-Handreichungen zur Erarbeitung von Rahmenlehrplänen—eine kritische Reflexion zum zehnten Jahrestag. In *bwp@ Berufs- und Wirtschaftspädagogik*, [www.bwpat.de](http://www.bwpat.de) (Ausgabe 8)
- Stratmann, K. (1975). Curriculum und Curriculumprojekte im Bereich der beruflichen Aus- und Fortbildung. In K. Frey (Hg.), *Curriculum-Handbuch*. Bd. 2. München: Piper, S. 335–349.
- Volpert, W. (1977). Von der Aktualität des Taylorismus. In F. W. Taylor: *Die Grundsätze wissenschaftlicher Betriebsführung*. Weinheim: Beltz, S. 9–51.
- Volpert, W. (2004). Eine Humanwissenschaft der Arbeit. In: Jüttemann, G. (Hrsg.), *Psychologie als Humanwissenschaft. Ein Handbuch* (pp. 228–241). Göttingen: Vandenhoeck & Ruprecht.
- Volpert, W. (2005). *Arbeitsgestaltung und Arbeitsorganisation*. In F. Rauner (Hg.), *Handbuch Berufsbildungsforschung*. Bielefeld: Bertelsmann, S. 294–299.
- Wissing, J. (1980). Zur Methodik des Fachzeichnens der konstruierenden Berufe [1932]. In *Quellen und Dokumente zur Geschichte der Berufsbildung in Deutschland*. Band 2A: *Quellen und Dokumente zur schulischen Berufsbildung 1918–1945*. Hrsgg. von K. Kümmel. Köln, & Wien, S. 133–139.
- Wissing, J. (1980). Die Fächerung des Unterrichts der gewerblich-technischen Berufsschule [1954a]. In *Quellen und Dokumente zur Geschichte der Berufsbildung in Deutschland*. Band 4A/1: *Quellen und Dokumente zur schulischen Berufsbildung 1945–1982*. Hrsgg. von K. Kümmel. Köln, & Wien, S. 290–301.
- Wissing, J. (1992). Ist die „Frankfurter Methodik“ fertig? [1954b]. In G. Pätzold (Hrsg.), *Berufsschuldidaktik in Geschichte und Gegenwart: Richtlinien, Konzeptionen, Reformen*. Bochum, S. 305–318.
- Wissing, J. (1968). Der Ausbildungsgang der Lehrbetriebe und der Unterrichtsablauf der Gewerblichen Berufsschule. In H. Röhrs (Hrsg.), *Die Berufsschule in der industriellen Gesellschaft*. Frankfurt a. M., S. 144–149.
- Wissing, J., Lowisch, J., & Bürgener, W. (1992). Methodik des werkkundlichen Unterrichts für Maschinenbauer [1960]. In G. Pätzold (Hrsg.), *Berufsschuldidaktik in Geschichte und Gegenwart: Richtlinien, Konzeptionen, Reformen*. Bochum, S. 319–332.



<http://www.springer.com/978-3-642-54223-7>

Areas of Vocational Education Research

Zhao, Z.; Rauner, F. (Eds.)

2014, IX, 274 p. 8 illus., Hardcover

ISBN: 978-3-642-54223-7