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The Job Role As A Reference Category For The Design Of Continuing Education In Production Companies

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Abstract

For effective Continuing Vocational Education and Training (CVET), a field of reference is needed. This can either be established through the concept of occupation (CO) or the actual job role. The concept of occupation can sociologically be understood as a community of practice of specialized people with particular qualifications and competences and therefore perform subtasks of larger groups and communities. “Members of this specialized community of practice gain knowledge about work processes, how to optimize procedures, and develop specific tools” [1]. Occupations are defined as social forms, whose members are similar to each other and different from others [2]. Organizational professions are understood as bundles of skills. The Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (Kultusministerkonferenz, KMK) suggests a Concept of Capacity to Act (CCA) which can serve as an instruction for further vocational education. It is described as the individual's willingness and ability to behave in professional and social situations in an appropriately thought-out and individually and socially responsible manner [3]. The CCA comprises the components of professional, social and personal competence, linked by methodological, learning and communication competence. These competence dimensions denote a leitmotif for the professional learning activities and processes. The occupation serves as a frame of reference for further education and training activities in the case of the professional community of practice, which is based on a group of people working in the field, with identical or very similar training and similar experiential process knowledge. These parameters can be used as a basis for the instructional design of competence development. Many jobs – most commonly in the field of academic positions in companies and organizations – are not defined by the CO, but by the actual job role. In production companies, employees who need to be addressed by the job role tend to work in fields like Research and Development or product design, whereas jobs that are structured by the CO can be found in production or logistics. People who execute a certain job role have various courses of study, professional experience, and competences. In contrast to jobs referring to the concept of vocation, there is no reference framework which can be used as a reference to design CVET. This has a direct impact on the didactics and instructional design, the skill and competence development in CVET. Due to the variation of knowledge and previous education, it is not possible in these cases to refer to a common training content. In these cases, CVET is not standardized in the same way as in the case of the occupations. Therefore, competence development goals cannot be structured in the same way. This raises the question on application of didactic and learning-theoretical basic categories to the conception of further training formats for this group of employees. However, it is still unclear if the job role as a category can be used as a frame of reference for CVET in a similar way as the CCA. The impact of the CCA and the job role on the learning theory and instructional design of CVET programs and competence development is evaluated in this article.

Keywords

Continuing vocational education and training; competences; occupation; job role; competence development

1. Work structured by the concept of occupation versus job roles

Working conditions, working environments and working requirements are changing more rapidly with the accelerated release of new technologies, as well as with cultural and societal changes. This makes CVET and lifelong learning essential for organizations, companies, and individuals. For CVET, a field of reference is essential to establish the frame of the training and define a starting point of the training. In this paper, we look at two different reference approaches: The CO and the concept of the job role. The core of the CO is the dual apprenticeship. The dual apprenticeship is a unique training system in the vocational education and training in the German speaking countries (Germany, Austria, Switzerland and Lichtenstein). Apprentices learn and practice during their apprenticeship (usually two to three years) at two different training locations: The company and the vocational school (VS). Training in the companies takes place three to four days a week, with vocational school days on one or two days. This dual system with theoretical inputs from the school lessons and practical learning parts in the companies, is reflected in the CO. This concept means that the dual education is structured by recognized training occupations and prepares for specific activities. In this context, occupations can be understood as communities of people who have specialized qualifications and competences and therefore perform subtasks of larger groups and communities. *“Members of this specialized community of practice gain knowledge about work processes, how to optimize procedures, and develop specific tools [1].* In the field of production, jobs which are structured by the CO often are so-called blue-collar jobs. Many employees who are carrying out jobs on the shop floor are specialists with completed recognized training occupations.

In contrast to the CO, the concept of the job role is defined by the job description, which outlines the respective assignments, functions and tasks in a certain work area. There is no defined education and training way into a job role, it can be performed by people with numerous backgrounds.

Vocational education and training is strictly regulated for certain job roles and thus, occupations develop along the actual requirements of work. Changes of the work requirements are integrated into the training framework curricula of the dual apprenticeship to guarantee the innovation process within vocational education [4]. Thus, vocational learning is subject to continuous adaptation to labor market requirements and new technologies. Through vocational training, current knowledge from the work is carried directly into the training. The CO serves therefore as a central reference category for competence development and occupational communities of practice structure of the labor market and communities of practice, which allows identification with fields of action, work tools and a group of people [5].

2. Occupationally and academically structured fields of work

The occupation is a central category for CVET activities that can be initiated by the group members themselves. It is often related to the content of the working area. Thus, it serves as a central category for the didactic design of CVET activities. The competence orientation and the preceding contents of the dual apprenticeship provide a content-related and formal framing. Additionally, a relative homogeneity of the learning group can be assumed due to the similar learning biographies. These determinants provide a framework for the didactic design and content orientation of CVET activities [5]. Regarding the learning trajectory the fields of work structured by occupations contrast with fields of work that are mainly structured by job roles, which are supplemented by – predominantly academic – training paths. As a rule, academic training paths are independent from work and business processes.

Academic studies are integrated into the scientific processes of specialized disciplines. Conveying content in academic fields is based on a higher level of abstraction, with a focus on basic research. Basic curricula consist of fundamental subjects such as mathematics and the natural sciences. For example, an aspiring production engineer has to focus on mathematical and scientific studies before specializing on applied content in advanced studies. Training for the actual job role is predominantly independent from academic studies. Thus, design and structure of CVET is subject to other premises than jobs that are structured by the CO.

In the following section, the central reference points for competence development in training occupations, both structured by the CO (Chapter 3) and by job roles (Chapter 4) are described. Finally, indications for the design of CVET in production are contrasted and summarized (Chapter 5).

3. Frame of Reference Concept of Occupation

The Concept of Occupation consists of the following core aspects:

- The Concept of the Capacity to Act (CCA, *berufliche Handlungsfähigkeit*),
- The community of practice
- The shared occupational and learning biography.

Below, abovementioned aspects and a discussion of their relevance to CVET are described.

3.1 Concept of the capacity to act professionally

The CCA allows apprentices to acquire "vocational skills, knowledge and abilities that are necessary to do qualified occupational work in a changing world and to acquire the necessary work experience" [6]. The CCA is a fixed element of the dual apprenticeship by the German Vocational Training Act (Berufsbildungsgesetz 2005).

The Concept of Competence (CoC) is central to the CCA. While there are several approaches to define the CoC, this paper focuses on the concept of The Standing Conference of the Ministers of Education and Cultural Affairs of the States in the Federal Republic of Germany (KMK) as the central actor within vocational education and training. The CoC simply means that actions are divided into different types of skills and abilities to execute them. Competences can be understood as the ability to apply learning outcomes adequately in a defined context which may be work, education or personal areas [7].

CCA comprises the components of **professional, social and self-competence**, linked by **methodological, learning and communication competence (KMK)**.

Vocational training – with a focus on professional skills – aims to develop skills in everyday professional life.

Professional competence within the KMK's concept is defined as the "willingness and ability to solve tasks and problems in a goal-oriented, proper method-oriented and independent manner on the basis of professional knowledge and skills and to assess the result" [3]. **Self-competence** is "the disposition to clarify, think through and assess development opportunities, demands and limitations in family, work and public life, to develop personal talents and to formulate and develop life plans" (Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung*, BMBF)). This includes qualities such as independence, critical thinking, self-confidence, reliability, and sense of responsibility. It also includes the development and self-determined commitment to well-thought-out ethical values. **Social competence** represents the willingness and ability to live and shape social relationships, to grasp and understand affections and tensions, and to engage and communicate with others rationally and responsibly. This includes the development of social responsibility and solidarity.

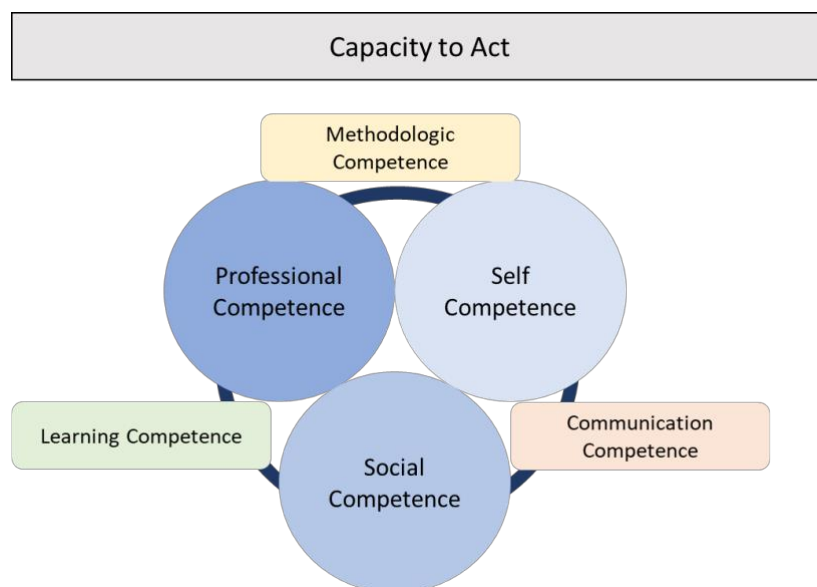


Fig.1 BMBF Concept of Professional Competence [8]

Cross Cutting Competences consist of the communicative competence, the learning competence and the methodic as cross-cutting competences. **Communicative competence** is the willingness and ability to understand and shape communicative situations [3] This includes the ability to think critically and develop an own opinion, being aware of needs and intentions as well as communicating them to others in a understandable way. But also, the comprehension of the thoughts and needs of others is meant by the communicative competence.

Learning competence is the willingness and ability to understand and evaluate information about facts and contexts independently and together with others. To classify information in mental structures and patterns. Learning competence also includes the ability and willingness to develop learning techniques like metacognitive strategies to observe which learning strategies work well. The application of those techniques on the job and beyond the job sector and to use them for lifelong learning are comprised within the learning competence as well. **Methodological competence** is a key competence that refers to the ability to use different methods to obtain, structure and analyze information. Methodological competence also means recognizing connections and deriving solutions from these structures [7].

Within the KMK framework CCA is described a blend of knowledge and skills. It is defined as the ability and willingness to work independently on professional tasks and to solve problems in a professionally appropriate and methodical manner – CCA includes the ability to assess the outcome and to derive patterns or re-evaluate workflows. A person's professional competence enables them to successfully master certain tasks, problems or challenges in his or her field of expertise [3].

Vocational actions can be fully structured and translated into training objectives, utilizing the conceptualized vocational action processes as defined within the CCA. In this way, requirements that arise (e.g. due to innovative technologies) are integrated into vocational training. This enables the restructure of training with content that responds to the changing work requirements in the various areas. In addition, the CCA enables the content to be organized and structured according to a system that emphasizes the progression of competence development from vocational novice to expert in professional work. Content can be organized by components of qualification, consisting of coherent sets of knowledge, skills and competences. A unit can be the smallest part of a qualification that can be assessed, transferred and, possibly, certified [7].

Vocational education and training provide a framework through the competence development goals, that represent an organizational framework for CVET. The learning content for further training can be designed along or complementary to the training regulations specified by the fields of action.

3.2 Community of Practice

The second aspect of the Concept of Professionalism, which can serve as a reference for instructional design for CVET, is the so-called *communities of practice* with their shared training and working experience. This leads to common ways of thinking and acting, as well as similar rituals. This enables the development of templates for thinking and action that can be applied in similar situations, while at the same time allowing for the integration of innovation. Due to the steady renewal of vocational training (see section above), as well as the identification with and affiliation to a vocational community of practice, the dual apprenticeship contributes to a high innovation potential. German small and medium-sized enterprises (SMEs) with their high level of training have the highest values in the EU for self-developed innovations, as well as innovations in sales, organization, and production (EU 2010). The strength of German industry therefore lies in the large number of skilled employees, who can contribute to optimized working processes and innovation through the CCA [9].

Therefore, the CCA is embedded in larger contexts than just the immediate wage-earning function. It connects a business and social context that cannot be reduced to the profit orientation of the employing or qualifying companies. Early on, this function was defined as an "inner vocation" or contribution to identity formation. It is based on the assumption of social tasks, which goes back to the original social division of labor and to which professions can still be assigned today [2].

Members of a professional community resemble each other based on shared collaborative experiences that impact them. This causes an alignment between one another and a difference in relation to the others. "These considerations again make a strong point, how into the occupation-relevant knowledge and ability certain personality structures are embedded, here in the form of certain handling forms with itself (its personal past, its experiences, fears and hopes) in addition, in the form of certain argumentation styles, ways of understanding the world, forms of thinking and consciousness" [10]. Occupations are to be understood as social forms that emerge in certain regions and cultures and as subcultures of a society, "formative on those who enter them and those who deal with them" [2].

This is useful when designing CVET programs: The members of the community have a similar understanding of their work processes and the goals of their work. They have a similar understanding of materials and dangers involved with their working process. For example, welder share a common experience related to working materials and have common knowledge about how to deal with problems that might come up during work processes. All of this can be presupposed by the instructor when elaborating the didactic design.

3.3 Identification through training and professional biography

Considering the community of practice and the sense of identification with the profession that comes with it, people have a similar training biography, which represents an additional identification factor: occupational and learning biography.

The feeling of identification with the community of practice is strengthened by the fact that people working in these professions have similar training histories. This represents another identification factor. Both, structural and individual characteristics, contribute to the formation of identification with the respective professional field.

With the development of CCA, a professional identity is formed. The nature of professional requirements and the willingness to solve and master them are essential for the development of identification with professional tasks. This desire forms a common basis among the learners.

In addition, there is the socialization through the trainees' institutions. The trainees are shaped by the same experience of attending both places of learning, (vocational) school and company, and learning together in theory and practice. They learn on practical and theoretical exams and thus develop similar learning heuristics. This shared influence creates a sense of identification with each other and, ideally, with the profession in terms of professional ethics.

Such a sense of professional responsibility – as an expression of professional ethics as action-reflective knowledge – is an essential prerequisite for responsible professional action and thus for professional design competence [11]. This is shared among the trainees. Ideally, ethics goes closely together with the desire to maintain and improve the professional environment in terms of work design [11]. On the one hand, this can be conducive to the design of further education formats since the learners bring their own concerns in terms of content and concept. Furthermore, it simplifies the didactic design of further education since a group with similar learning requirements can be assumed.

The concept of competence-oriented training with practical components in the company, the community of practice and the shared learning biographies enable a targeted and tailor-made further training design, that can be strictly oriented towards the needs of the learners.

4. Job role reference frame

In areas of production that are design and development oriented, there are many fields of activity that are carried out by people whose work and training are not governed by the CO, but by job descriptions or job roles. The lack of a CO means that employees have different, mostly more abstract qualifications. They only get to know the job requirements while working. Fields of activity that require academic education are therefore not filled with people who have had reproducible training. They often learned more abstract, non-specific content with a strong focus on methods that can be used in various fields of application. The abovementioned reference points for CVET must be reconsidered at this point. In these cases, the knowledge and skills relevant to the activity are located differently and the training and biographies of those carrying

out the work differ considerably. This has a direct impact on the didactic design of learning, education and competence development processes in work-related CVET. In these cases, it is not possible to refer to the CCA, the community of practice or the common learning experiences in vocational training. CVET cannot be standardized in these use cases in the same way as for training professions. Therefore, other learning theories and basic categories must be applied to create effective training for this group of employees.

4.1 Analysis of tasks within the job role

To be able to conceptualize further training needs in these fields of work, the work tasks and job descriptions as well as the company are considered as central reference points for the didactic design of job-related further training. The work tasks and activities usually merge into the job role. When determining the objectives of the further training programs, the importance of the company is in the foreground, as the corporate strategy sets direction and content of the further training. In order to design the learning objectives, the current specific activities, i.e., the job role of the person carrying out the work, must be seized accordingly. The basis of this analysis can be the competence assessment and survey. This involves looking at the work tasks that employees in a particular job role are currently performing. These work tasks serve as an anchor for the development of further training activities. In contrast to the classic work and requirements analysis, it is not the content of the individual tasks (the "what") that is relevant, but how they can be mastered in a goal-oriented and successful manner (the "how") [12]. To determine the goals of continuing education activities, it is usually important to align them with strategic corporate goals. The analysis of a work environment with the modeling and design of competence building activities is described, for example, in the Competence Compass developed at Fraunhofer IAO.

4.2 The Fraunhofer Competence Compass as an instrument for analyzing work tasks and the design of continuing training

The Fraunhofer Competence Compass describes an approach for identifying the goals of CVET through strategy linkage by the identification of competences and their development of competences through training activities. The Fraunhofer Competence Compass can be used to identify competence needs in organizations [13]. It offers a systematic approach for strategic competence management with the analysis, design, and balancing of continuing training needs and strategic competence development as well as continuing education planning for organizations.

For all stakeholders involved, such as employees and managers, it is necessary to schedule sufficient time for the competence needs assessment. Depending on the focus, the assessment can be carried out, for example, in the form of interviews, employee discussions, management discussion rounds, etc. This applies not only to the actual time required for the competence needs assessment, but also to the planning, introduction and follow-up for all stakeholders involved in the process.

Orientation of the further training activities

The first step is to determine the goal of the CVET. In order to design training activities in a didactically meaningful way, the goal of the activities must first be determined. This can be done, for example, by holding workshops with subject matter experts and executives to derive specific fields of action from the corporate strategy and to identify areas of activity that the company will need to master in the future. This is followed by the specification of tasks in the fields of action that the company, its departments or employees will have to master in the future. In an internally or externally moderated workshop with relevant representatives of the company, the current situation of the company can be systematically examined, and future developments and strategic targets can be reflected upon. Strategic learning objectives for further training can be derived from this.

Competence assessment

The competence assessment ensures that the required competences are available for all important work tasks in organizations and that employees are optimally qualified for current and future tasks. Therefore, the

second step is the systematic structuring and specification of a model considering the work context. To create a competence model, competence classes must first be selected according to which the competence requirements assessment is to be structured. A competence model includes competence classes (*Which competences do we want to consider?*), the scope of the model (*A model for the whole organization or only for certain functions?*), assessment levels or competence levels (e.g. beginner-expert) and the specification of competence profiles (*Existing competences today? Important competences in the future?*). A competence model also defines key terms for the organization and creates a common understanding among all stakeholders [14].

Competence Measurement

The decision of a competence model for the fields of work for which further training activities are designed, is followed by the third step. The third step is to measure and assess the existing competences within the framework of the competence model and a competence requirement assessment. In measuring and assessing competences, it is necessary to answer the question of which competences exist today and at what level, and which competences need to be developed or acquired in the future. Methods of measuring existing competences are for example, self-assessment and external assessment of employees, observation of work processes, interviews and questionnaires, and, if necessary, further assessments.

The measurement results in the *ACTUAL* competences of the employees. These *ACTUAL* competences can now be contrasted with the required *TARGET* competences of the strategic corporate, divisional and departmental goals from step 1. In this way, "gaps", which contain the goals of the further training activities become visible. The contents of the gaps represent the contents of the CVET.

Competence development

This also represents the fifth step in the competence compass. This step is about the way in which competences can be built up and (further) developed.

Depending on the training objective, a specific method is suitable. For example, a self-learning phase or trainer input may be well suited to impart knowledge. For building specific skills or developing a specific behavior, other methods like business simulation games, simulations, or role plays, are better choices [15]. The proximity or remoteness of the training to the workplace also depends on the objective of the measure [16]. Should the learning activities take place in the process of work in order to learn as close to the application as possible or are cross-situational competences addressed that are initially learned outside of an everyday work situation. The type and content of the build-up measure are derived from the respective objective. In addition, it must be determined whether the measure is more concerned with the development of a specific behavior or rather with the transfer of knowledge. It must also be determined which employee groups are to be addressed and to what extent.

For a meaningful and targeted design for a successful implementation, a competence needs assessment requires clear responsibilities for the design and implementation of the activities and acceptance by all stakeholders. This can be achieved, for example, through planned change management.

Competence reassessment

The activities can be assessed in a fifth step to evaluate whether they have been successful in the sense that the competences have been developed or if the need to be adjusted.

5 Conclusion

The two approaches different core concepts of competence development show that both, the CO and work in the sense of the job role, can serve as a field of reference for the design of curricula and the didactic structure of CVET. The argumentation explicitly shows that the orientation towards occupations offers a more structured framework. It allows an orientation towards existing competence frameworks and qualifications when creating CVET offers.

The communities of practice serve as a framework because they enable the reintegration of work changes, and work experiences into the curricula. Therefore, curricula are always up to date, allowing for state-of-the-art training- and CVET. Similar learning biographies allow instructors to find familiar learning formats. Additionally, instructors benefit from homogeneous prior knowledge of learning methods within the group.

Regarding the non-occupationally organized fields of activity, it is first necessary to identify the existing qualifications and competences. A structure for competence development needs to be elaborated in the different work contexts. This provides a basis for determining which skills can be assumed. Once the skills have been analyzed, they can be a starting point for the didactic design of further education, like in the occupational fields.

Communities of practice can be replaced by identification factors such as the product or the job family. In many cases, a similar learning biography cannot be assumed for activities organized by job role. During the academic study, it would be worth considering whether the increased emphasis on methodological competences, as well as the socialization processes can be treated as similarities in learning biographies.

The two approaches to the design of continuing education and training show that both occupation and work in the sense of the job role can serve as a reference field for determining competences and designing continuing education and training. In this way, the job role or work as a reference field for continuing education has similar orientation factors as the occupation. In general, however, it can be stated that vocational education is more pre-structured, and this simplifies the didactic design of continuing education and training.

Nevertheless, there are also many cases in which both, vocationally and academically trained employees, need to build up competences, e.g., through the introduction of a new technology. It should be noted that the needs of both groups must be considered to ensure successful competence development.

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Biography

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