

## What does it mean to provide process-oriented training?

► **The new training regulations stipulate the demand for “process-oriented” implementation of training, with the goal of simplifying the adaptation of training to the requirements of industrial work processes and the rapid technological and organisational transformations. The current regulations specify business tasks which are described in general terms, and the enterprises have to provide the clear definition of the content themselves. This article describes the consequences for the implementation of training which arise from process orientation, and designates the new tasks connected with it and the skills requirements for the personnel involved.**

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A fundamentally different, that is, process-oriented approach to structuring new training regulations has been introduced with the reorganisation of the metal and electrical occupations in 2003 and 2004, if not before. This has created essential prerequisites for process-oriented initial training.<sup>1</sup> Important factors in this process are transformations in the following areas, among others:

Changed organisational concepts in the enterprises lead to more complex occupational tasks and require a higher degree of self-reliance and ability to organise.

- The accelerated technological development (especially in ICT) renders reactive development of training regulations unfeasible.
- Quality assurance, not by controlling results but by stipulating processes (ISO 9000 ff.).
- Current concepts of learning and instructional theory legitimise a process-oriented approach in training.
- Training increasingly takes place in a decentralised way in professional contexts/processes, i.e. in close proximity to the workplace.

The role of training regulations is to provide a clear and legally binding identification of the skills that must be imparted during training. This positive description of the training content has so far not only made it difficult to adapt the content to the progress in technology and organisation but also has not taken company peculiarities into account. Finding a replacement for the identification of such concrete skills, knowledge and qualifications therefore became a necessity for the development of regulations. This replacement turned out to be the stipulation of core and occupation-specific skills, which are imparted in a “process-oriented” way on the basis of occupation-specific tasks and then expanded in a deployment area.<sup>2</sup> One thing that will change because of process orientation is the understanding of the occupation concept: the uniformly recognised federal minimum requirements for an occupation are no longer tied to mastering specific technologies and

manufacturing methods but to mastering certain occupation-specific work processes. Occupational profiles are generated via skills.

## Requirements of the new training regulations

Two new requirements have been introduced with the process-oriented training regulations:

1. The clear definition of the content prescribed in the training regulations has to be derived from output processes in the enterprise. This constitutes a new task for the trainers.
2. Imparting “process competence” is the goal of the training provided. This includes two important dimensions: On the one hand the ability to act competently within the company framework – in this sense, “process competence” is an element of action competence integrated into a process. On the other hand it implies the ability to shape and change processes with a view to optimising quality and efficiency.

### DERIVATION FROM COMPANY PROCESSES

The requirement of providing “process-oriented” training is meant to allow enterprises to adapt their training to the state of technological and organisational development. The training regulations specify only typical occupational tasks/bundles of activities; the technologies used for them have to be derived from processes in the enterprise. In this way the state of technology in the respective company providing training becomes the standard. This means that different content is imparted, which is not considered as a problem. For example, if the training regulation prescribes the process “Installation and configuration of IT systems”, it is for the company to decide which operating system will be used. It could be Windows, Linux, Unix or even Windows CE. The stipulation of process orientation means that the technologies utilised in the company must be taught during the period of training.

The consequences of process orientation for basic vocational education are not entirely clear. Are the concepts of general basic education and process orientation mutually exclusive because general and broad basic education usually imparts content that is not needed in this form in the enterprise? Process-oriented training regulations no longer prescribe general basic content. This does not mean that carrying out basic education is explicitly prohibited. However, it does not correspond to the intentions of this new form of training. Still, common and non-occupation-specific content within an occupational field is not to be

dispensed with. But instead of a common basic education for a particular occupational field,<sup>3</sup> process-oriented training regulations stipulate common core skills. They must be binding parts of the training content, just like the occupation-specific skills.

### PROCESS COMPETENCE

What is to be taught as process competence is stipulated only in very general terms by the new training regulations. Formally speaking, the competence to act is concretised in company processes. Which processes these are specifically is not stipulated in the training regulations. On the one hand this gives the companies providing training an additional window of opportunity. On the other hand this vagueness has led to misunderstandings up to now in the discussion on “process orientation” which have made its practical implementation more difficult. Everyone interprets the orientation as applying to the context in which they are dealing with “processes”.

Our assumption is that for the implementation of open-design training regulations, processes can be differentiated on three levels:

First level: Business processes

A business process is the sum of all company activities<sup>4</sup> that produce and support a value (a service or product) for the customers. In their totality they implement the business purpose of an enterprise, starting with the placing of orders and ending with the receipt of an agreed outcome by the customer. A business process can be subdivided into sub-processes through repeated divisions, down to the individual activities.

Second level: Output processes

In business management and elsewhere, the company organisation of all activities that are required for the faultless production of the output are described as the output process.

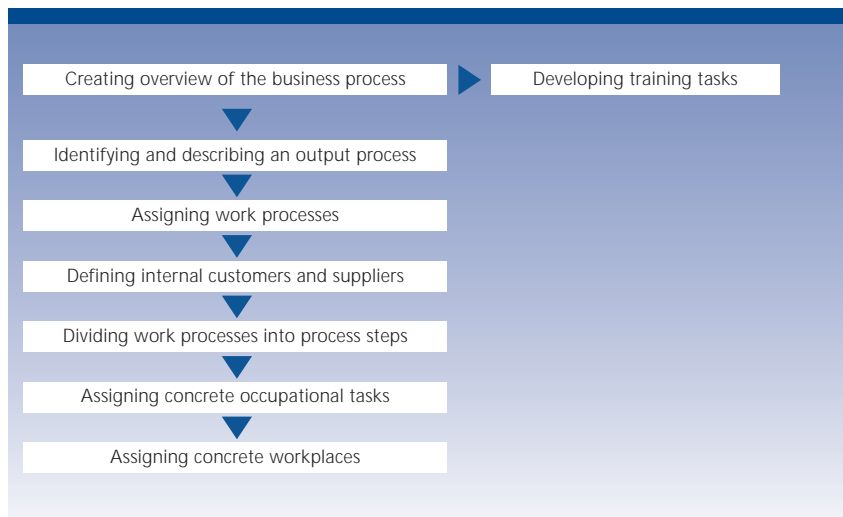
Third level: Work processes

The term work process refers to the sequence of individual work steps and describes how job tasks are carried out. It can be seen as a differentiating sub-unit of output processes.

The link with business processes is unproblematic. They are usually described for enterprises, and trainees can easily find out about them for themselves from the relevant documents. The work processes can also be defined unequivocally. Those are the processes the trainees are supposed to be able to carry out.

For teaching process competence, one will have to refer above all to the middle level, which is called the output process here. The reason is that goods and services are usually performed cooperatively by employees with different occupations. However this process is defined and delineated, it will comprise more job activities than can be performed by the trainee. According to more recent production concepts, however, the main thing is that despite their different occupations, employees should be capable of consulting among themselves about process optimisation. Process competence can thus be defined as the ability to make an active contribution to that optimisation.<sup>5</sup> It is proposed here that the process that the employees are supposed to help shape be defined as the output process. Thus the definition must dynamically follow the organisational development of the enterprise. (cf. Fig. 1)

Figure 1 Identification of suitable work process steps



## Process-oriented planning and execution of training

### STIPULATING IN-COMPANY LEARNING SITES

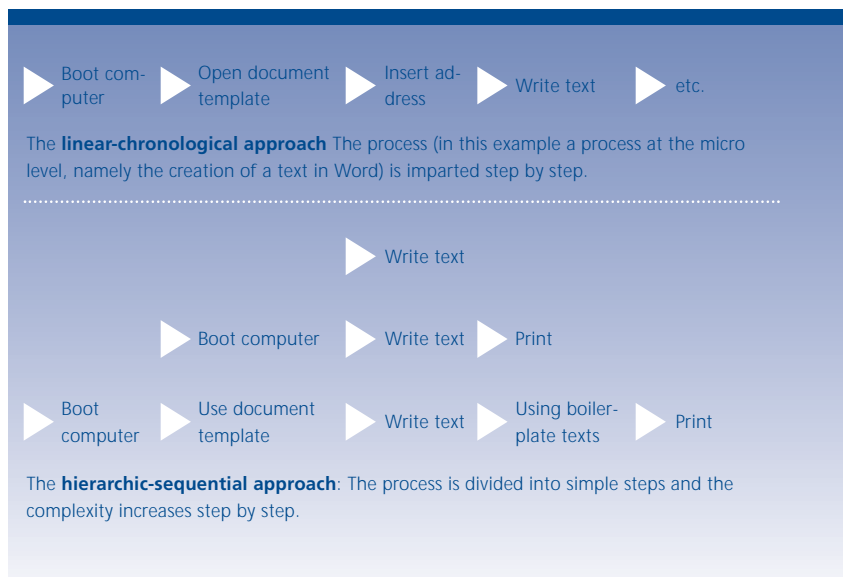
Three decisions have to be made in advance of carrying out process-oriented training:

1. Which company output processes is the training to relate to?
2. Should training be given directly in the company output processes or removed from them?
3. In what order should the job tasks be taught in the selected output process?

Another question needing clarification is how optimum harmonisation can be achieved between vocational school and training enterprise. Analysis of the business, output and work processes in the enterprise must always be the basis of in-company decentralised training. It is possible to determine on the basis of the occupation-specific technical skills that have to be taught pursuant to the training regulation and the common core skills which workplaces and tasks or sub-tasks are suitable for teaching those skills. A corresponding flow chart can be made.

The output processes suitable for carrying out the training can certainly not always be deduced from the training regulations. Often the job description items will not correspond with the company organisation items. To conduct the training in a process-oriented manner, one follows the company organisation and then checks whether all the content to be taught is covered. If training in the company output processes is not possible, i.e. instruction must be removed from those processes, it should nevertheless be aligned to real tasks or a concrete process. In such cases, however, trainees should know the company process well. That can be achieved through exploration tours, for example.

Figure 2 Planning of occupational tasks



### STIPULATION OF OCCUPATIONAL TASKS

The requirement that training be process-oriented suggests that one should also let oneself be guided by the specific output process in teaching individual occupational tasks. In principle there are two different approaches to how that can be systematically planned: firstly the linear-chronological approach and secondly the hierarchic-sequential approach (cf. Fig. 2).

*Linear-chronological* means dealing with all the tasks in a process one after the other. In the process, individual action steps can be presented in more or less detail, so that as training progresses, more complex and complicated relationships can be dealt with. This approach is only appropriate if business and output processes are not too complex. Under the pedagogic postulate of “completeness”, some tasks will be dealt with that are ordinarily performed co-

operatively. This form is implemented particularly consistently through the concept of “learning on the basis of customer orders” for training in the crafts.

*Hierarchic-sequential* means that the occupational tasks in one process are divided into individual sequences and the training-relevant ones are selected from these. The sequences increase in scope and difficulty and hence in complexity as well. The hierarchy of tasks arises from that. One starts with as simple a task as possible. Before that, the process as a whole should be dealt with (creation of an orientation base) so that the trainees can classify the individual tasks correctly.

#### PREPARING LEARNING TASKS

Often the occupational tasks required in the process are too difficult at first to be performed by the trainees. They have to be separated into sub-tasks and require didactic reduction.

The so-called learning tasks are a form of the hierarchic-sequential approach that is especially suitable for process-oriented training.<sup>6</sup> These should meet two requirements:

1. Learning tasks should be so easy that trainees can acquire the relevant knowledge through their own work.
2. Each learning task should provide the preconditions for the next. A system of learning tasks therefore always prescribes the order in which the tasks will be dealt with.

One starts the task planning with a so-called core task. This task should be as typical of the work in the process as possible. The core task is systematically expanded. The expansion can take place in two directions: on the one hand, the difficulty of the task can be increased and on the other, one can have preceding or following tasks dealt with within the process. The expansion continues until all the work processes to be learned have been mastered.

#### INTEGRATION OF VIRTUAL LEARNING OPPORTUNITIES

Virtual learning opportunities can support process-oriented training in a variety of ways, e.g.:

1. Integrating Internet-based learning systems to support process-oriented training organisation;
2. Using online communities as problem-solving aids<sup>7</sup> in the context of on-the-job learning arrangements;
3. Open learning architectures as additional information, communication and cooperation opportunities<sup>8</sup> in the sense of optional learning opportunities and for opening up individual roads to learning.

## Need for virtual learning opportunities

Using these virtual learning opportunities is becoming more and more urgent in view of the progressive specialisation and constant development of technology. Not all specialised qualifications relating to occupational

tasks and processes typical of the vocation can be taught to the same extent at the present learning venues, since the expertise of the training personnel and the equipment of the installations are insufficient. Another reason why virtual learning opportunities are needed is that, when first approached, processes can often be better visualised and taught via virtual models and simulations.

### Interlocking of company-based and school-based learning venues

Process orientation is not only a matter concerning in-company training. Instead, the concept of the training regulations includes the idea of making vocational school training more practically oriented as well. The theoretical parts of the occupational training content are therefore no longer structured systematically by subject but process-oriented by *learning fields*. The educational mission of the vocational schools is formally regulated in a decision of the Conference of the Ministers of Education of March 15, 1991. There the main focus is on the acquisition of occupational ability. The training regulations prescribe the didactic principle of using situations which are important for doing a job as points of reference. The starting point is formed by actions which the learners have to plan, implement, evaluate, correct (if necessary) and finally assess as independently as possible.<sup>9</sup> The complete action model and process orientation thus serve as orientation for both vocational school and in-company training. The teaching staff at the vocational schools have to use real company processes as a guideline, replacing the purely subject-centred system of teaching by a structure oriented on work processes. This paradigm shift requires a certain degree of flexibility on the part of the people involved. Since the contact to the companies often leaves much to be desired, there is also a certain danger that teaching takes place on the basis of assumed work processes which do not meet the actual requirements of company practice. Another obstacle turns out to be the fact that the timeframes of the learning fields in vocational school and the corresponding in-company training need to be coordinated, which is sometimes impossible for objective reasons. If school and enterprise are to be harmonised in this regard as much as possible, it is helpful if the schools and teachers make their annual planning transparent to the enterprises affected,

thus providing a starting point for communication and cooperation. This process can be supported and simplified by implementing joint areas of communication on the Internet (for example via mailing lists).

## Higher demands on the training staff

Process orientation as a new didactic concept<sup>10</sup> in education and training relates to organisational development as a whole and thus confronts the personnel in occupational pedagogy with fundamentally new tasks. The teaching staff are expected to start by identifying the business, output and work processes that are relevant for implementing the stipulations of the training regulation. The next step is to not only describe but also to analyse these processes, i.e. by dividing them into segments which form sub-processes representing meaningful units for teaching the trainees. The ensuing drawing up of learning tasks is a didactic challenge which requires close cooperation and professional exchange with the experts from production. This applies even more to the application of the learning tasks during the course of training. If they are to be learned directly within work processes, it is necessary to interfere with the organisation of work. In other words, the trainees are increasingly learning at the respective workplaces, in every case supported by learning assignments. These assignments are then evaluated on the basis of specific agreements with the trainer or the skilled worker in charge of training. The training staff plan, organise and moderate these training segments in coordination with the technical departments involved.

## Conclusion

The introduction of open-design training regulations presents new challenges for the training staff, challenges which they have not been prepared for sufficiently, if at all. Despite the temporary suspension of the Instructor Aptitude Ordinance (AEVO), or maybe even because of it, successful completion of a Training for Trainers course (AdA) is still considered as a sign of quality in a company career, and the courses offered by the Chambers continue to be in demand. But process orientation is not even a subject in the AEVO in its amended 1999 version, neither in field of action 2 "Planning the training" nor in field of action 4 "On-the-job training". Action orientation as a didactic background is not sufficient to qualify the trainers for determining the training requirements, drawing up activity analyses and developing learning tasks.<sup>11</sup> Apart from that, it is becoming increasingly common to assign training responsibilities to part-time trainers without any formal qualification, i.e. to the so-called skilled workers providing training. An enormous demand for qualification is emerging here which needs to be satisfied at all levels. We need the theoretical foundations for a new didactics, the establishment of a new qualification standard in occupational pedagogy with new role profiles for the education personnel (both in the company and at school), and of course a transformation in company organisation and in the employees as a whole.<sup>12</sup> ■

### Notes

- 1 It is interesting that the importance of process orientation for a viable reform of vocational education and training has already been pointed out in 1985 by Kruse (Kruse, W.: *Von der Notwendigkeit des Arbeitsprozeß-Wissens*. In: Schweitzer, J. (ed.): *Bildung für eine menschliche Zukunft*. Munich 1986, pp. 188–193)
- 2 Compare in this regard § 3 of the respective ordinances
- 3 This terminology is still used in § 3 (Electrical and metal) but refers only to the first year of training, and only if that training takes the form of a Basic Occupational Education Year.
- 4 In the DGQ terminology this refers to core processes, management processes (coordination, control, strategy) and support processes (information structure/knowledge management, quality management, infrastructure). On the description of business processes cf. Bullinger, H. J.; Warnecke, H. J.; Westkämper, E. (eds.): *Neue Organisationsformen im Unternehmen*. 2nd, revised and expanded edition. Heidelberg, New York 2003, p. 747
- 5 Instruments which are utilised for this purpose in the respective organisational units of enterprises are, for example, quality/Kaizen circles. Please also refer to the model of the European Foundation for Quality Management [www.efqm.org/model\\_awards/model/excellence\\_model.htm](http://www.efqm.org/model_awards/model/excellence_model.htm)
- 6 Cf. for a more extensive discussion the respective self-learning modules by Koch, J.: "Handlungs- und prozessorientiert ausbilden" in the Learning Centre of the [foraus.de](http://foraus.de) forum [http://foraus.de/lernzentrum/handl\\_prozess\\_ausb/handlungs\\_auswahl.html](http://foraus.de/lernzentrum/handl_prozess_ausb/handlungs_auswahl.html)
- 7 Zinke, G.: *Lernen in der Arbeit mit Online-Communities – Chance für E-Learning in KMU*. In: BWP 32 (2003) 1, pp. 44–47
- 8 Cf. Zinke, G.: *Online-Communities in der Berufsbildung – Ergebnisse einer Online-Befragung und Ansatz für offene Lernarchitekturen* [www.bibb.de/de/wslk8503.htm](http://www.bibb.de/de/wslk8503.htm)
- 9 Cf. the "Verordnung über die Erprobung einer neuen Ausbildungsform für die Berufsausbildung in den industriellen Elektroberufen" and therein, the respective framework curricula Part III "Didaktische Grundsätze"
- 10 Cf. Koch, J.; Meerten, E.: *Prozessorientierte Qualifizierung – ein Paradigmenwechsel in der beruflichen Bildung*. In: BWP 32 (2003) 5, pp. 42–46
- 11 However, we should not even assume that the principle of action orientation has gained general acceptance. The 4-stage method still dominates the AEVO examination focus on instruction. Cf. Lauterbach, U.; Neß, H.: *Vier-Stufen-Methode oder handlungsorientierte Unterweisung?* In: *Die berufsbildende Schule* 52 (2000) 2, pp. 49–56
- 12 We would be happy to receive feedback on this article. For a public discussion we suggest the forum "Process-oriented training" on [foraus.de](http://foraus.de), to be found under <http://foraus.de> -> Member forums