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Changing Requirements on Employees

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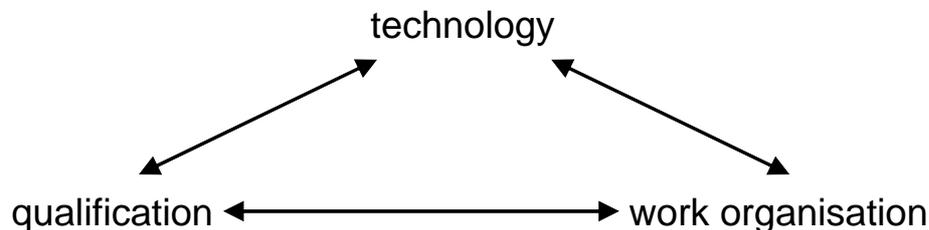
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Changing Requirements in Work

In the course of a turning away from a strict division of labour, i.e. a Taylorist work organisation, towards a more holistic mode of work, an integration of brainwork and manual work is taking place. For the sphere of industrial work this may mean that the brainwork in planning and preparation as well as in servicing and checking combines with the manual work of carrying out an operation. Over the last decades a change in the technical productive field towards a holistic and lean production has taken place (and sometimes also towards a learning organisation). These changes have entailed particular follow up changes. Especially for skilled and specialized workers the amount of dispositional work has increased. Requirements now include flexible working hours, agreement and division of labour in teamwork, independent planning of work tasks, independent analyses of faults with appropriate action, responsible disposition of materials and tools, as well as quality control, responsibility for keeping to schedules, and participation in cost management. As a consequence of these major changes of the characteristic of skilled work particularly personal and social skills (e.g. self-confidence, readiness to make contact with others, conflict solving) will be required. Summing it up, the requirement is for independent planning, execution and control as laid down in the German training regulations of the industrial and electrical trades.

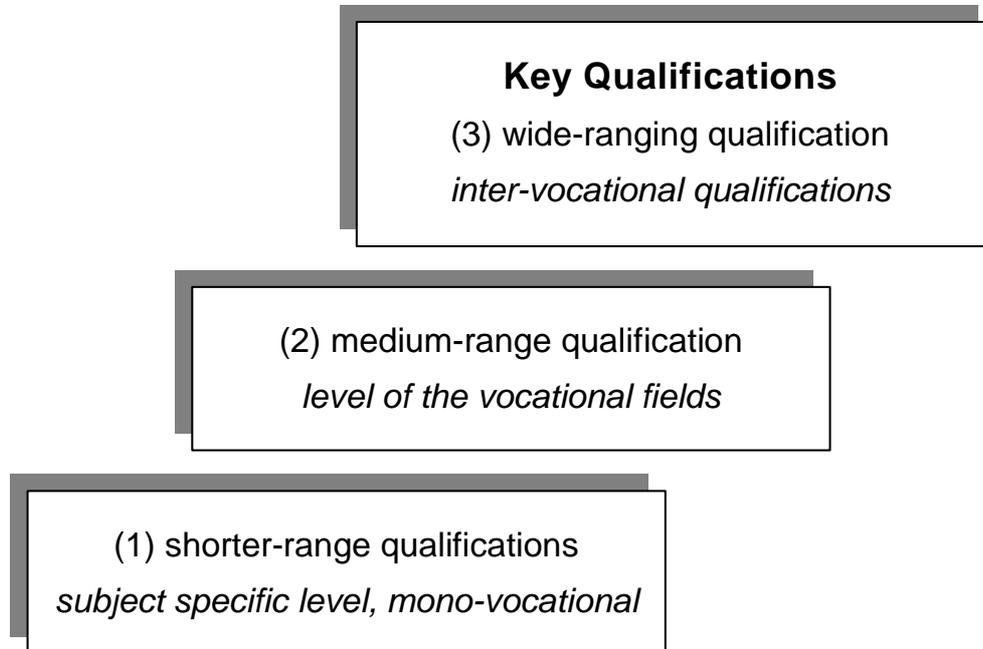
Modern concepts of management expect for the future employee in the firm that the employee contributes towards shaping the mutual triangle of relations between technology, qualification and work organisation. This means that the development and application of technology, work organisation and qualification with his participation are to be adjusted to each other and optimised. Here, the employee is involved in a work-oriented creative concept.



These requirements of the modern world of work lead to a problem that shall only briefly be touched upon here. On the one hand, human qualities, e.g. independence, team-work etc. are expected of employees and also rewarded. On the other side, however, it must be seen that these human qualities are then applied to achieve rationalisation. In other words, humanisation is regarded as rationalisation potential.

Different Levels of Vocational Competences

Vocational competences for fulfilling the requirements of the workplace can be differed on three various levels:



Shorter-range qualifications on the subject specific level are mono-vocational. They are related to the work place and the specific products. This includes e.g. specific regulations for installation of electrical cable or the programming of a CNC-cutting or turning machine. These qualifications of shorter range underlie a fast technical and economic change and can be unimportant within a few years.

Medium-ranged qualifications refer to abilities of a complete vocational field, e.g. mechanical engineering, electrical engineering, civil engineering or economics. One medium-range qualification in the field of electrical engineering could be the handling of a multi-meter. Another example for a medium-range qualification from the vocational field of mechanical engineering could be a basic form of test engineering.

Wide-ranging inter-vocational qualifications – here also called key qualifications – are abilities with a broader character. They span over the different vocational fields. For examples see next page.

Key Qualifications

Key qualifications can be defined, as the human attributes which underlie people's ability to act in an appropriate way due to the requirements of complex tasks at the workplace and the ability to prepare one self for economic and social change situations in personal or work place contexts. People who possess key qualifications have the ability to manage themselves in relation to economic and social change situations in personal or work place contexts (the terms 'key qualifications', 'key competences' or 'core competences' are often used synonymously).

Reasons for the Concept of Key Qualifications

The above given definition leads to two aspects reasoning the importance and consequence of key competencies. One aspect depends on the uncertain requirements of work in the future due to a rapid change in technology and economy. Needed qualifications to fulfil the requirements of a specific vocation in a few years can hardly be predicted. Special shorter-range qualifications on the subject specific level can be obsolete in a few years. Wide-ranging inter-vocational qualifications – called key qualifications – can prevent this threat as a lasting foundation for employees. Having such qualifications in one's disposal, a person will be able to go for life long learning and fix new requirements coming towards the person. According to his future prospects in job, livelihood and the source of revenue stand on a robust base.

The other aspect reasoning the importance and consequence of key competencies is the actual situation of requirements in work of today. Specialist work gets more and more computerized. This leads to a more complex and holistic character of a workplace where different kinds of requirements are integrated in most of the current professions. Efforts to increase productivity and product quality with a simultaneously reducing of costs and production expenditure, lean production and holistic manufacturing methods become more and more important. The importance of group and team work grows. These requirements of daily work need abilities which can be described with key qualifications found in the field of formal cognitive abilities as well as personal and social abilities.

Key Qualifications in an Overview

For broad based and deep level competences – here key qualifications – tables had been dressed, containing up to 650 expressions. It does not make sense, to list them up here. From this background the most frequently quoted terms were shown here as they were:

- thinking in contexts
- flexibility
- to handle new situations
- ability to communicate
- creativity
- to take initiatives
- to analyse and solve problems
- independence and self-steering capacity
- transferability
- reliability

<p>material knowledge and skills</p>	<p><u>Wide-ranging practical oriented knowledge and skills:</u> measuring technique, industrial safety, machine service, being able to convert working instructions in the form of drawings into plans of action, the capacity to seek and recognise faults and reasons for malfunctioning of systems or equipments, economical way of work; ability to read, apply and produce technical documentation; planning and control of work execution and the flow process; supervise and assess results of work.</p> <p><u>Widespread vocational knowledge and skills of general education:</u> cultural techniques, communication in a foreign language, technical and economic general education, information technology, using computers and the Internet.</p>
<p>formal abilities - cognitive field</p>	<p><u>Ability for independent thinking and learning:</u> analytic thinking, synthetic thinking, creativity, technical appreciation, transferability, ability to solve problems, rating ability, critical thinking.</p>
<p>formal skills - psychomotor field</p>	<p><u>General motor skills:</u> coordination, good shape of constitution, quick to react, manual skilfulness, concentration, feel for the use of materials and tools.</p>
<p>personal abilities</p>	<p><u>Virtues at the workplace:</u> precision, reliability, aspiring to quality of work, conscientiousness, being dutiful.</p> <p><u>Abilities with individual accentuation:</u> independence, fair criticising of others, tolerance for getting criticised, self confidence, optimism, orientation to results.</p> <p><u>Abilities with moral accentuation:</u> acting according to moral standards, ecological responsibility.</p>
<p>social abilities</p>	<p><u>Group-oriented behaviour within working communities:</u> readiness to cooperate, ability to make contact, ability to communicate, tolerance, fairness, sincerity; frankness, team orientation.</p>

Key qualifications in an overview according to Schelten 2000

The Goal: Vocational Competence

The common goal of all organisations taking part in vocational education is to develop and foster vocational competence. The training in vocational competence makes it necessary to realise a creative work-oriented concept (see above). This means that the development and application of technology, qualifications and work organisation take place with the active and responsible participation of the employee.

Differentiation: Competences vs. Qualifications

The notions of competences represent responsibilities, abilities and strengths that the employee contributes towards mastering his vocational tasks. Competences are person-related and general. Qualifications, on the other hand, are seen here as related to the specific workplace. Qualifications are particular skills and abilities required by the firm to meet the requirements of a particular job. Thus qualifications are listed in job descriptions. Competencies, by contrast, are the personal attributes through which an employee matches up to the demands of his work. Qualification requirements are fulfilled with the aid of competences. But competences go beyond and also exist besides qualification requirements.

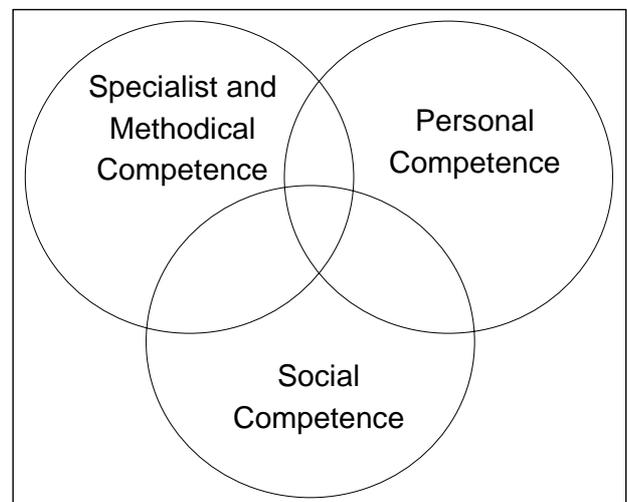
Vocational Competence: A Complex of Three Fields

Vocational competence concludes the sections specialist and methodical competence, personal competence and social competence. This division is familiar, convenient and handy.

Specialist competence includes the possession of specialist knowledge, abilities and skills. Methodical competence includes independently finding, examining and applying solutions to complex work tasks. This includes the capacity for the independent acquisition of new knowledge, abilities and skills, which is also termed learning competence and frequently treated separately.

Here, however, we will count learning competence as part of methodical competence. Specialist and methodical competence frequently overlap. For instance, the capacity to seek and recognise faults and reasons for malfunctioning of systems or equipments require both specialist knowledge and, integrated with this, strategies for locating faults, i.e. both, specialist and methodical competence.

Personal competence refers to the development of a positive self-image. The individuals own abilities are to be consciously brought out and reflect on together with the motivational and emotional aspects of personality development that are connected with them. In vocational training theory, one also refers to human competence instead of personal competence.



In the case of social competence, what is involved is the capacity for intercourse with other human beings and beyond this group-oriented behaviour within working communities.

Vocational competence then emerges as the combination of the three fields of competence, specialist / methodical competence, personal competence and social competence. Vocational competence, however, does not appear merely in the intersection of all three sets specialist / methodical competence, personal competence and social competence.

Vocational Competence and Key Qualifications

Vocational competence can be linked with the concept of key qualifications. On the level of key qualifications, specialist competence is found in the field of material knowledge and skills, e.g. being able to convert working instructions in the form of drawings into plans of action. In the case of specialist competence, however, proceeding from these wide-ranging inter-vocational material qualification, particular account must also be taken of the underlying medium range qualification level of the vocational fields, as well as the shorter-range qualifications on the subject specific, mono-vocational level.

For methodical competence, together with material knowledge and skills, formal abilities in the cognitive area are particularly required, such as analytical or synthetic thinking. Apart from this, formal skills in the psychomotor field are also important for methodical competence, such as a feel for the use of materials and tools.

Within the concept of key qualifications, personal competence is to be found in the field of personal abilities. This refers to endowment with virtues at the workplace that once were described simply as moral qualities. Among these we may mention precision and reliability. In the case of personal competence, main terms of abilities were particularly related to the individual such as independence and self-confidence, together with traits of a moral nature such as a sense of ecological responsibility.

Within the concept of key qualifications, social competence is covered by the social abilities, to which for example the ability to make contact or to communicate with others belongs.

How Experts Differ from Novices

People who have developed expertise in particular areas are, by definition, able to think effectively about problems in those areas. Understanding expertise is important because it provides insights into the nature of thinking and problem solving. Research shows that it is not simply general abilities, such as memory or intelligence, nor the use of general strategies that differentiate experts from novices. Instead, experts have acquired extensive knowledge that affects what they notice and how they organize, represent, and interpret information in their environment. This, in turn, affects their abilities to remember, reason, and solve problems. Scientific key findings came from the study of people who have developed expertise in areas such as chess, physics, mathematics, electronics, and history. These key findings are relevant for vocational trainees as well because they are expected to become experts in these or any other areas. Due to that the study of expertise shows what the results of successful learning look like.

We consider several key principles of expert's knowledge and their potential implications for learning and instruction:

- Experts notice features and meaningful patterns of information that are not noticed by novices.
- Experts have acquired a great deal of content knowledge that is organized in ways that reflect a deep understanding of their subject matter.
- Experts' knowledge cannot be reduced to sets of isolated facts or propositions but, instead, reflects contexts of applicability: that is, the knowledge is 'conditionalized' on a set of circumstances.
- Experts are able to flexibly retrieve important aspects of their knowledge with little effort of attention.
- Though experts know their disciplines thoroughly, this does not guarantee that they are able to teach others.
- Experts have varying levels of flexibility in their approach to new situations.

Expert's abilities to reason and solve problems depend on well-organized knowledge that affects what they notice and how they represent problems. Experts are not simply 'general problem solvers' who have learned a set of strategies that operate across all domains. The fact that experts are more likely than novices to recognize meaningful patterns of information applies in all domains, whether chess, electronics, mathematics, or classroom teaching.

An emphasis on the patterns perceived by experts suggests that pattern recognition is an important strategy for helping trainees to develop confidence and competence. These patterns provide triggering conditions for accessing knowledge that is relevant to a task.

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