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Future demand for qualifications based on expected megatrends

Results of the 2016 survey on demand for qualifications carried out on behalf of the Federation of Austrian Industry

Megatrends such as Industry 4.0, globalisation, demography (aging, migration) are lasting sources of changing requirements for activities and, as a consequence, also competences of employees. Essentially it is a matter of an increase in the significance of higher qualified activities: this means broader and more complex ranges of tasks, increased implementation in teamwork/project work arrangements (and, as a consequence, an increasing significance of soft skills) and also more extensive know-how about company-based processes. The effects of the megatrends are particularly relevant for the middle level of skilled labour (employees with an apprenticeship, technical vocational school or college qualification).

Many companies consider themselves/their employees to be not sufficiently qualified with regard to the developments initiated by Industry 4.0 and globalisation/internationalisation. Corresponding qualifications in the sense of higher vocational qualifications become apparent across the different types of occupations and qualification profiles and must by no means be seen as identical to academisation: jobs which require an academic education represent only part of the entire demand of companies for a higher qualified workforce.

Megatrends such as Industry 4.0, globalisation, demography (aging, migration) are usually viewed in isolation and are discussed with regard to their respective, potentially negative or positive effects on employment. There are comparatively few empirical findings, however, on their effects on the requirements in terms of the activities and therefore competences of employees. This group of themes is therefore the focus of the current survey on demand for qualifications carried out on behalf of the Federation of Austrian Industry (IV)¹.

How much are Austrian companies affected by the mentioned megatrends? What developments can be expected? What effects will they have on the activity and therefore also competence requirements of employees? To what extent are these adequately prepared for the challenges? Or can (manifest) competence deficits be determined and, if so, in which areas? The **main results of the study**² are:

(1) For a long time the effects of (mega)trends have been moving towards higher qualified activities

During the last decade, on account of megatrends such as automation, digitisation, globalisation and also demographic developments (aging, migration), there have

been relevant changes in most of the surveyed companies in the way production processes are arranged in terms of work organisation and which, roughly speaking, have also had an influence on the different activity profiles and, as a consequence, the qualification and competence requirements of the employees. Companies are “affected” to varying extents by these megatrends – as shown by the often wide range of estimates of the strength of these trends by the companies. There is the following overall picture:

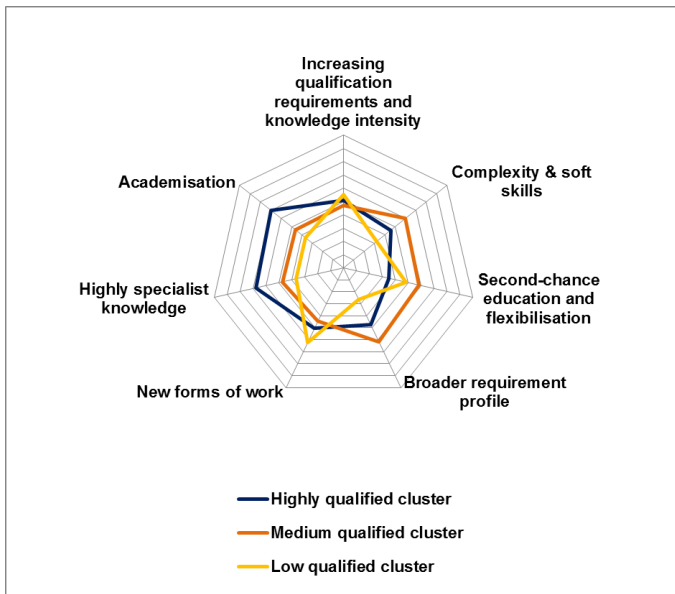
The **trend** is going clearly in the **direction of higher qualified activities**, and here broader and more complex ranges of tasks, increased implementation in teamwork/project work arrangements (and, as a consequence, an increasing significance of soft skills), and more extensive know-how about company-based processes go hand in hand with changed flexibilisation requirements and work-life balance ideas. **Specialist knowledge** therefore often **no longer suffices** in order to adequately meet the activity requirements.

The need for more highly qualified staff is often equated (in the media) with an increased demand for academics, but this is not the case. In most companies the demand for higher qualifications concerns the level of skilled la-

bour (employees with an apprenticeship, technical vocational school or college qualification). The quantitative demand for more highly qualified staff is therefore more differentiated, both in terms of the qualification requirements and also the specified contents, than is suggested by stereotypes of academisation as being the sole requirement. This means that in the last decade the most extensive changes have been in companies of the “medium qualified” cluster³: the complexity of activities, soft skills and broadness of professional requirement profiles have changed the most. This was not achieved by recruiting higher education graduates but mainly with higher vocational qualifications in second-chance education and by extending flexible recruitment arrangements (and also by reducing simple manual employment areas). The trend towards higher qualifications which can be observed is therefore the result of the combination of increased recruitment of formally highly qualified people, of subject-specific higher qualification, of additive skills/competences (going beyond specialist professional knowledge) and also the decline in the number of low-qualified employees.

It is remarkable that there is no difference between the three qualification clusters identified in the study with regard to the basic megatrend towards increased qualification requirements for employees and the intensification of knowledge for the occupations/tasks. But they do clearly differentiate in the way this trend was taken into account, i.e. in which forms and specific arrangements it materialised:

Diagram 1: Changed activity and competence requirements: trends observable to date, by qualification clusters



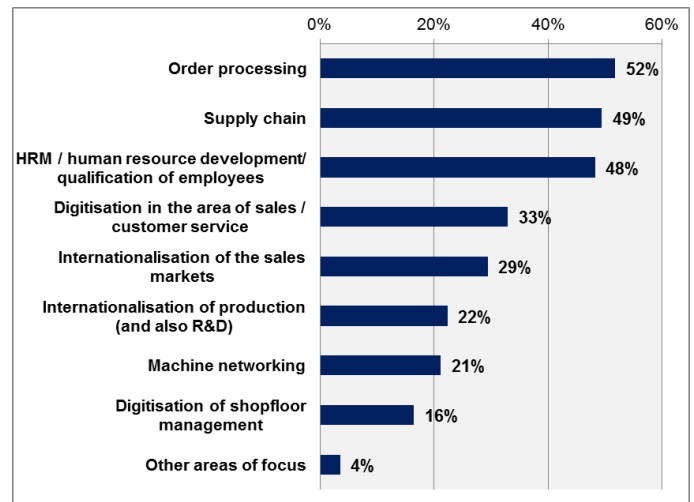
Source: 2016 ibw-IV survey on demand for qualifications

(2) The significance of (mega)trends which take effect at the same time will increase in the future – digitisation / Industry 4.0 is a key driver of change here

Most companies assume that the mentioned megatrends will, in the future, be even more relevant than they have been so far.

The focus of future productivity/efficiency increases (cf. Diagram 2) at many companies is on digitisation along the entire value chain/supply chain, usually referred to as Industry 4.0⁴. Often the areas which are upstream and downstream from the actual company-based production process have been called order processing and sales here. It is notable that the machine networking which primarily concerns the “in-house” company production process and also the digitisation of shopfloor management were not ranked among the top priorities. At the same time, the qualification of staff and therefore human resource development are also promoted. The third field of action of future productivity/efficiency increases is an increased/intensified internationalisation/globalisation of sales and also production (locations).

Diagram 2: Targeted productivity and efficiency increase (multiple responses possible)



Source: 2016 ibw-IV survey on demand for qualifications

This basic pattern of prioritisation with regard to targeted productivity and efficiency increases can be seen in all three qualification clusters. The “medium qualified” cluster, in which digitisation/Industry 4.0 will apparently be promoted more strongly in the future than in the other qualification clusters, is notable, however. Corresponding qualification of employees is apparently often *conditio sine qua non*: 60% of companies in this cluster count on HRM/human resource development/ qualification of employees compared with 36-39% in the other two qualification clusters. Internationalisation is rele-

vant for all three clusters, but companies of the “low qualified” cluster strive the most for increases in potential in this field.

(3) Industry 4.0 and effects on employment

One key question in connection with digitisation is whether Industry 4.0 will lead to negative or positive effects on employment in the long term. Contrary to the first studies, which “predicted” dramatic changes (e.g. that 47% of the US workforce is “endangered” by automation⁵), current analyses assume that automation usually does not affect entire occupations but only individual activities. In addition, there are also no direct/simple causalities between the level of qualification and the potential/risk of automation. If these findings are accurate, there is a significant implication for education and qualification: it suggests that there can be adaptation to technological change via re-qualification/continuing education and training, and that this adaptation is necessary in all qualification segments/levels.

(4) Megatrends lead to increased competence requirements for employees

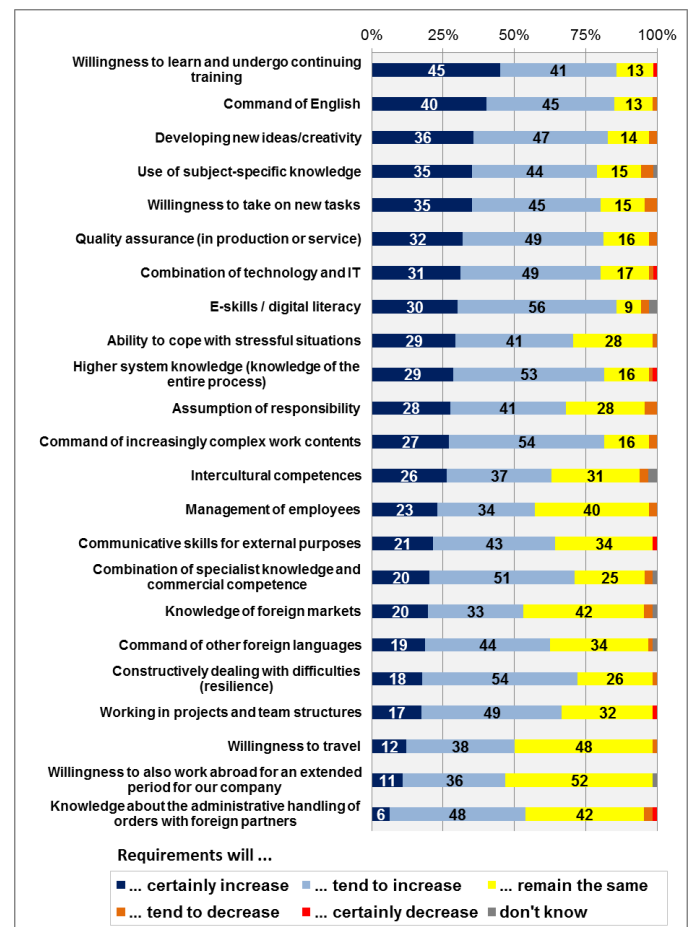
Based on this study/survey it can be deduced that the vast majority of employees – irrespective of the qualification level of their occupational area and the department at the company in which they work – will be affected by changed competence requirements from the perspective and in the assessment of the companies. Diagram 3 presents the survey results.

At a meta level these can be summarised into five areas of competence⁶: “methodological competence” (system knowledge, technology and IT, e-skills, subject-specific knowledge, mastery of complex work contents), “cooperation competence” (combination of specialist knowledge and commercial competence, innovative capacity and willingness to take on responsibility, willingness to learn), “social competence” (teamwork, communication, leadership skills, stress resistance, resilience), foreign languages and intercultural action competence and also willingness to go on stays abroad and knowledge of foreign markets/customers.

There are no clear connections between changed competence requirements and the qualification level of the occupational area/the company department. But often the requirements in terms of the competences of the employees increase with the qualification level of the companies. Companies of the “highly qualified” cluster therefore tend to have higher requirements for their employees than companies of the “medium qualified” cluster. These in turn have higher requirements than companies

in the “low qualified” cluster. Two exceptions to this “rule” are notable: with the requirements in terms of social competences the situation is reversed: here it is the companies in the “low qualified” cluster which assume a stronger increase in the significance of the social competences of their employees than those in the other two clusters (in the “medium qualified” cluster a similar level of requirement can be observed). The second exception concerns cooperation competence, which is more demanded in particular by companies in the “medium qualified” cluster.

Diagram 3: Significance of the megatrends for the future requirements placed on employees (in percent)



Source: 2016 ibw-IV survey on demand for qualifications

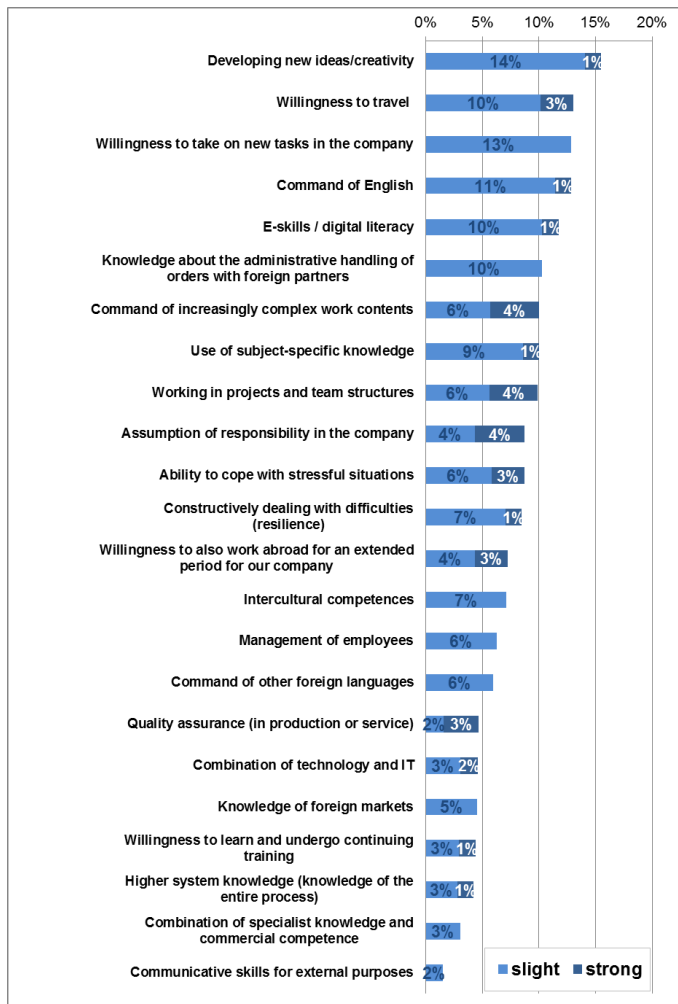
(5) Many employees are not sufficiently qualified for the challenges of digitisation/Industry 4.0 and globalisation

The increasing competence requirements for the employees on account of the changed activity profiles caused by the megatrends must also be evaluated against the background of current competence deficits. Together they mean increasing qualification requirements (both for employees and also in companies).

In addition to specialist knowledge and typical competence requirements for the particular occupation such as command of English, e-skills, etc. (i.e. hard skills), these

also concern soft skills and the creative potential of the employees. One in seven companies has deficits among the employees in these fields. There are also deficits with regard to the willingness to travel and the willingness to take on new tasks in the company. One in ten companies assumes a current deficit in command of English and in the area of e-skills/digital literacy (cf. Diagram 3).

Diagram 4: Current competence deficits in companies



Source: 2016 ibw-IV survey on demand for qualifications

This approach illustrates that there are **no actually distinct competence deficits among the employees**, which is indicative of the quality of vocational qualifications (both IVET and CVET).

This picture is rounded off by asking the companies whether and to what extent the **qualification of their employees is lagging behind with regard to Industry 4.0 and globalisation/internationalisation**. 10-20% of

companies were decidedly in agreement with this question (depending on the company department which was considered). The fact that the need for action/qualification is greater, however, can be seen by the statistic that another 25-55% of companies (again with information given according to the company department which was considered) indicated that their company was “to some extent” lagging behind with regard to the two megatrends. This means that **50-70% of companies see themselves as not adequately qualified** in terms of the qualification requirements for **Industry 4.0**. With regard to globalisation/internationalisation, the corresponding shares range between 30% and 55%. Qualification deficits can therefore be seen a little more with respect to Industry 4.0 than for globalisation/internationalisation.

The entire study can be downloaded from <http://www.ibw.at/de/ibw-studien> (in German).

¹ The study is based on an online survey among IV member companies which was conducted in February 2016. The 85 companies participating in the survey employ around 93,000 employees. The sample reflects strongly the companies' structural features in the manufacturing sector.

² cf. Schmid, Kurt / Winkler Birgit / Gruber, Benjamin (2016): Skills for Today. Aktueller Qualifizierungsbedarf und Rekrutierungsschwierigkeiten [Skills For Today. Current Demand for Qualifications and Recruitment Difficulties]. ibw research report no. 185.

Schmid, Kurt / Winkler Birgit / Gruber, Benjamin (2016): Skills for the Future. Zukünftiger Qualifizierungsbedarf aufgrund erwarteter Megatrends. [Skills for the Future. Future Demand for Qualifications on Account of Expected Megatrends]. ibw research report no. 187.

³ The surveyed companies are characterised by a wide range of different company-specific qualification structures. Based on the formal educational qualifications of their staff they can be assigned to three so-called qualification clusters. The terms used for the three clusters (highly, medium and low qualified) only aim to distinguish the companies' formal qualification structure with one keyword. There is no intention to rate them and such a rating is not implied in these groups because the companies' qualification structure, business purpose and production methods are in a complex interrelationship.

⁴ In the survey and therefore also the study there is no strict differentiation between digitisation, automation and Industry 4.0 because there is usually vagueness in the language use and there are no generally valid strict definitions. Digitisation describes the general process of a widespread use of information and communications technologies in companies. Automation is geared more towards machine-based production and Industry 4.0 summarises new trends in the use of internet technologies for communication between people, machines and products.

⁵ cf. Frey Carl Benedikt / Osborne Michael A. (2013): The Future of Employment: Oxford Martin School & Faculty of Philosophy, UK.

⁶ The individual queried competences were pooled together into competence areas based on an explorative factor analysis (main axis analysis).