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VET TRENDS 2018

- Digital Transformation – VET 4.0
- Future of Work-Based Learning
- Financing VET
- Migration and Integration

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- Researching
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- Shaping the future

EDITORIAL

DIGITAL TRANSFORMATION – VET 4.0

FUTURE OF WORK-BASED LEARNING

FINANCING VET

MIGRATION AND INTEGRATION

REVIEW

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VET trends 2018

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Dear readers

Welcome to the international edition of our journal "Berufsbildung in Wissenschaft und Praxis/BWP" (Vocational Training in Research and Practice), which brings together research findings and practical experiences in the field of vocational education and training and is published by the Federal Institute for Vocational Education and Training (BIBB) in Germany. This special edition is a compilation of articles of relevance to an international community that have been translated into English. It addresses two topics that are of permanent concern in international cooperation and two further issues that have become highly pertinent over recent years.

One topic high on the VET agenda worldwide is the promotion of work-based learning (WBL). This seems to represent a silver bullet for quite a number of educational and economic challenges, such as the transition of young people from school to the world of work. Although the idea of providing high quality apprenticeships is intrinsic to the dual system, this constitutes only one conception of WBL. Notwithstanding this, BIBB takes an active part in the international debate. In June 2017, we joined forces with UNESCO-UNEVOC to invite scholars to deliberate on WBL as a pathway to competence-based education. The papers and the main findings from this international workshop will be available in a forthcoming publication.

Whenever BIBB hosts international delegations, the issue of vocational education and training as an investment and the question as to how VET can be financed in a sustainable way are extremely relevant. Research outcomes regarding the cost-benefit ratios of company-based training are an area of particular interest. Within the German context, these provide a good explanation of why companies are motivated to offer apprenticeships. In other national contexts, these tried-and-tested models and instruments need further adaptation.

Digitalisation, epitomised in terms such as Industry 4.0 or Smart Factory, is changing the world of work and the qualification requirements of skilled labour. IT competence plays a key role in virtually all areas of employment. The deployment of digital glasses in design and construction and the use of drones for performing topographical surveys are examples of technologies that make work easier. Therefore, it may be the right moment to question whether it is still appropriate to differentiate between "blue collar" and "white collar" workers. As technical requirements become more demanding, a considerable degree of significance is being attached to further vocational training within the scope of lifelong learning. Learning will be increasingly IT-supported, and new didactic concepts and pedagogical approaches are possible. However, there is also a demand for teachers and company-based trainers who have the necessary expertise to instigate successful digitalised learning environments at schools and firms. Furthermore, small and medium-sized enterprises (SMEs) will need additional support in developing and implementing their own strategies towards digitalisation.

One final topic that has grown in relevance is migration and the integration of refugees into the labour market. This has particularly been the case since the year 2015, when Germany began to receive large numbers of refugees from countries such as Syria. Over recent months, several programmes and initiatives have been assisting young refugees in gaining access to vocational education and training. Many refugees will already have acquired a professional or vocational qualification in their home countries. The German Recognition Act helps them to secure recognition of these qualifications in order to enter the German labour market.

We are confident that this special edition offers plenty of interesting material and we hope you enjoy reading it.

Yours,

B. Thomann

In turbulent times, we need vocational education and training which offers balance

FRIEDRICH HUBERT ESSER
Prof. Dr., President of the BIBB

Nothing characterises our lives more than the phenomenon of acceleration. Media topics replace one another in the news at ever greater speed, and new smartphone models are released onto the market at shorter and shorter intervals. Such matters are a frequent source of fascination for us. At the same time, we ask ourselves what the price of this accumulating dynamism may be. Some fear that they will not be able to keep up and may even feel that digitalisation is jeopardising their job. In the light of growing digitalisation, networking and automation, the pressure on vocational education and training is increasing in much the same way. Especially in such turbulent times, we need a VET system which offers balance, combines tried and trusted elements with innovation and adopts an active yet cautious approach to driving forward reforms.

Actively shaping change

BIBB has identified the requirements arising from digitalisation in as timely a manner as possible and promoted innovation in order to continue to develop the dual system in a research-based way. Brief mention should be made of three recent research results in this regard. Firstly, we have discovered that "Economy 4.0" is accelerating the structural shift towards more services. As our QuBE projections demonstrate, sectors such as "teaching occupations", "healthcare professions" and "residential homes and social services" are deriving a benefit from this. Secondly, we are able to state that the polarisation thesis put forward by Frey and Osborne does not strictly apply. Any rise in the proportions of low-skilled and highly skilled employees at the expense of staff at the intermediate skilled worker level will only occur in a very small area of German trade and industry. And thirdly, our preliminary investigation into dual core IT occupations and our cooperation with Volkswagen have shown that, although updates are needed in some occupations, adaptations at the level of company-based training organisation are already providing a means of keeping pace with technological developments.

Combining tried and tested elements with innovation

BIBB will follow up these findings by embarking upon a future-oriented and practical programme of substantive research. A joint initiative with the Bundesministerium für Bildung und Forschung (BMBF) [Federal Ministry of Education and Research] will look at the following questions in further selected branches and occupations. What remains important, and which competences need to be expanded for tomorrow's world? And how can schools and vocational education and training make appropriate preparations? BIBB will continue to support providers of inter-company VET on the basis of the guidelines for the promotion of digitalisation in inter-company vocational training centres and in centres of excellence. SMEs and education and training providers in particular will be given assistance with the digitalisation process within the scope of the third funding round of the JOBSTARTER plus programme.

In addition to this, the focus is also on a further area in which BIBB is conducting research – media competence and digital media in company-based vocational education and training. This is linked with issues such as how learning in the smart factory takes place, which new forms of teaching and learning are emerging in Training 4.0, and which media teaching skills trainers will need to have at their disposal in future.

In all these activities, it is important to us that the academic research process feeds back into VET practice. ◀

Translation from the German original (BWP 2/2017): M. S. Kelsey

Digital technologies make work more demanding

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Although ongoing digitalisation of the production and of the service sector is stoking fears of job losses, there are indications that the overall effect on employment will be relatively slight. In fact, the main expectation is that the nature of work will fundamentally change. As the use of digital technologies increases, employees will be able to carry out more demanding tasks. This article uses data from a current additional survey of the BIBB Establishment Panel on Qualification and Competence Development to investigate the impacts of the deployment of digital technologies from firms' point of view.

Substitution or new requirements?

The predominant assumption in the relevant literature is that in future new digital technologies and media will be increasingly able to replace human work in the execution of repetitive tasks that are easily programmable (cf. Autor et al. 2003). Because the programmability of tasks which require skill, the handling of "irregular objects"[1] as well as social and creative intelligence is limited (cf. Frey/Osborne 2016; Tiemann 2016), such activities should grow in importance in the wake of the technological shift. Many studies are currently examining this approach by looking at the potential substitutability of humans by machines. Despite technological progress, no massive collapse in employment has been discernible thus far. Autor (2015) explains this by stating that machines complement human tasks in a wide variety of ways rather than merely replacing them. Like Spitz-Oener (2006) before him, he also points out that the essential development will be a change in the *task contents* of employees. Technology is making work more complex. The long-term forecasts that have emerged from the BIBB/IAB qualifications and occupational field projections also indicate that digitalisation will exert a relatively small effect on employment development in purely quantitative terms however labour demand will shift towards more complex tasks (cf. Wolter et al. 2016). This article will examine this result from the perspective of firms and illustrates the extent to which the deployment of digital technologies in companies is already associated with higher requirements for employees. It also presents the tasks which particularly define requirements in the workplace. This provides indications as to how likely human work is to decline in significance as digitalisation continues to advance.

The data base

In order to derive the requirements for employees, we began by looking at the profiles of tasks exercised. The analysis uses data from an additional survey of the BIBB Establishment-Panel on Qualification and Competence Development (BIBB Training Panel) in 2016 (cf. Information Box), in which information on the task profile of workers

BIBB Training Panel

The BIBB Training Panel is a regular annual survey which has been conducted since 2011. It is used to collect representative longitudinal data on the training activities of companies in Germany. Since the 2014 wave of the survey, around 3,500 firms have been taking part. Selection takes place via a disproportionately stratified sample of the statistical population of all companies with one or more employees subject to mandatory social insurance contributions. The questionnaire used each year includes questions on the filling of training places, company recruitment activities and advanced and continuing training measures.

The analysis forming the object of the present article uses data gathered from an additional survey carried out in 2016 via computer-assisted telephone interviews (CATI) with 3,500 companies. This survey especially encompassed detailed questions on the technological status of companies.

[1] Frey/Osborne (2016) make reference to the processing and handling of inconsistent objects which cannot be easily recognised or read by a machine and in general terms to work in an unstructured environment that is subject to frequent change.

and on the use of digital technologies at the surveyed companies was collected. In order to gain information on the technological status of companies, the survey included questions about the types of digital technologies they deploy.

The particular advantage of using data from the BIBB Training Panel is that the views of company owners, managing partners and – at larger firms – executive managers are heard. It therefore delivers information on how entrepreneurs and HR decision makers assess task contents. This could potentially lead to a bias of the results if the way in which the latter view task characteristics deviates starkly from the perception of the employees. Nevertheless, the employers' view of the staff task profile is ultimately the one which is considered in human resources planning at the company, providing valuable indications as to how employers perceive task requirements.

The task requirement index

Before moving on to investigate the correlation between task requirements and the use of digital technologies, the requirements for employee groups at the surveyed firms from the point of view of the human resources decision makers were identified. The latter were asked to consider different employee groups – workers performing simple, qualified and highly qualified tasks – and to state the frequency with which workers carried out repetitive, manual, interactive and knowledge-intensive tasks on a scale of 1 "never" to 5 "very often". A principal component analysis (cf. Information Box) was then used to reduce the total of eight items (cf. Table) to a small number of components which bundle the information of these variables and map their relationship to one another. The starting point is the assumption that repetitive tasks tend to be highly associated with lower requirements and that knowledge-intensive tasks tend to correlate with higher requirements. Because only the first component (of a total of five to be considered) corresponds to this assumption, this component is selected as the index of task requirements and is used during the further approach.[2] The overall KMO criterion of 0.91 (cf. Table) attests a "marvellous" fit of the variables (cf. Kaiser 1974) for a principal component analysis.

The component loadings of the individual variables reveal how much influence the respective variables exert on the index value. In accordance with our assumptions, the loading reflects the fact that frequent execution of repetitive tasks lowers the index value whereas the exercising of knowledge-intensive activities increases the value. The table illustrates that a frequent performance of manual tasks has a positive effect on the index. Pfeiffer/Suphan (2015) point out that the operation of machines is in particular often viewed as a routine task, which is expected to be increasingly replaced by computers, even though such tasks are certainly demanding and complex. This finding is supported by the principal component analysis.

The exercising of interactive tasks corresponds to positive loadings of 0.48 and 0.49, respectively the strongest influence on the value of the requirements index. This shows that the requirements profile is crucially defined by social competencies and even more so than by knowledge-intensive tasks. Another interesting aspect is that programmable tasks influence the index value considerably less than assumed within the scientific discourse, the loadings in this regard being -0.12 and -0.13. From companies' point of view, the average influence of knowledge-intensive and interactive tasks on the level of task requirements is actually around four times higher than for repetitive tasks. This concerns tasks which place demands on the social and creative intelligence of employees. As described at the outset, these tasks differ from repetitive tasks in that they can only be taken on by machines to a limited extent. This suggests that, from the company perspective, changed requirements mainly arise from the new interplay between humans and machines and are not so much a result of the substitution of machines for employees.

The principal component analysis

The principal component analysis (cf. Jolliffe 2002) is a dimension reduction procedure. It generates so-called principal components from a number of variables. These principal components reflect common information and are able to explain the variation in the variables. A principal component analysis uses a number of variables to produce precisely the same number of components. The initial components already explain most of the variation. Generally, only components which explain more variation than the original variables are taken into account (Kaiser criterion, cf. Kaiser/Dickman 1959). In this way a multitude of variables can be represented by using a relatively small number of components. The component loading states how much information is gained from the underlying variables. The loading, thus, corresponds to the weighting with which the variables influence the relevant principal component. Values range between -1 and 1. The suitability of a certain group of variables for a principal component analysis can be judged on the basis of the Kaiser-Meyer-Olkin criterion (KMO criterion, cf. Kaiser 1974), which assumes values of between 0 and 1. Values greater than 0.5 are deemed to be acceptable.

Influence of the use of technology on task requirements

After observing which tasks particularly define requirements in the workplace, we now investigate the extent to which task requirements increase due to the use of digital technologies within the company. On the one hand, this in-

[2] The first extracted component explains 33.81 % of the total variance of the underlying variables.

Table
Component loadings of the task characteristics*

Category	Item	Component loading	KMO criterion
Repetitive programmable tasks	"Tasks for which all details are pre-stipulated"	-0.12	0.82
	"Tasks in which processes are repeated in every detail"	-0.13	0.83
Manual tasks, perception and handling	"Tasks for which they use tools or operate machines such as control or computer systems"	-0.22	0.91
	"Tasks for which they use dexterity and craft trade skills"	-0.20	0.91
Interactive, social tasks	"Tasks in which they inform or advise customers or patients"	-0.48	0.93
	"Tasks which involve persuading others and negotiating compromises"	-0.49	0.92
Knowledge-intensive, creative tasks	"Tasks in which they organise processes or conduct research"	-0.49	0.93
	"Tasks in which they improve or pilot procedures and processes"	-0.41	0.92
Total			**0.91**

* Explained overall variance of the components = 33.81 %, n = 7,894. Because task profiles were surveyed for three employment groups at different qualification levels, a company may exhibit up to three task profiles. These were weighted in accordance with the respective proportion of the employment group.

Source: Additional survey of the BIBB Training Panel 2016, own calculation.

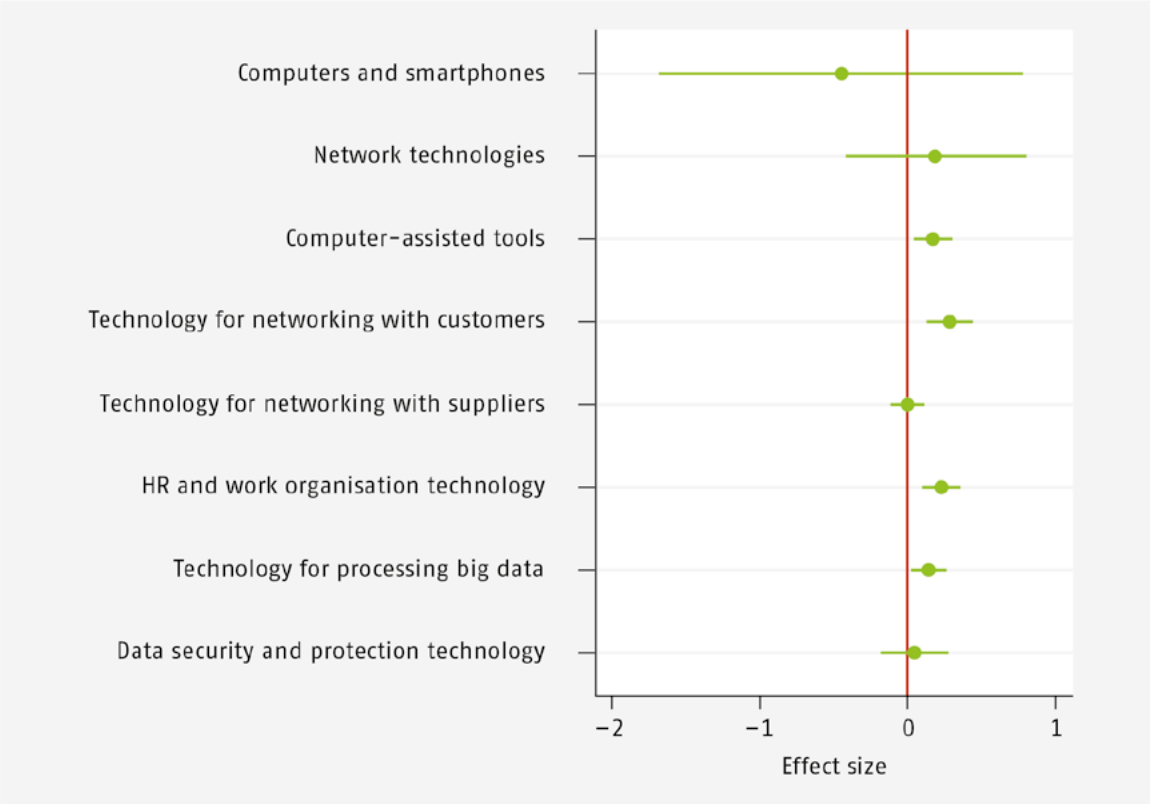
volves a consideration of established digital technologies such as computers, smartphones and network technologies (e.g. the Internet and email). On the other hand, we also enquire into technologies, which are associated with the increasing digitalisation of trade and industry because of their constant further development. These encompass computer-assisted tools (e.g. CNC machines or cyber physical systems), technologies for networking with customers (such as a company's own Internet presence or the use of social media), technologies for networking with suppliers (for instance via the use of ERP systems), technologies for human resources and work organisation (e.g. HR facility management tools), technologies for processing of large quantities of data (e.g. cloud computing) and technologies for data security and data protection.

The result of the regression analysis conducted for this purpose is presented in the Figure (p. 8). The plotted points show the value of the coefficients, i.e. the effect which the individual types of technology have on the requirements in the company. The further away a point is from the red zero line, the stronger the effect. The horizontal lines plot the relevant confidence interval. If the latter includes the zero line, no significant correlation exists between the technology and the task requirements level.

The results show that computer-assisted tools, technologies for networking with customers, technologies for human resources and work organisation and technologies for processing of large amounts of data all significantly increase requirements for employees from companies' point of view. In this context, this indicates that fewer repetitive routine tasks, more manual tasks, and in particular more interactive and knowledge-intensive tasks, are performed by employees in companies at which such technologies are deployed. Although technologies such as computer-assisted tools facilitate work, by the same token they require higher cognitive and manual skills to control the machines. The existence of an internet presence with product listings and ordering or reservation systems also places higher cognitive demands on employees. The use of social media opens up new opportunities for customer communication, which brings about an increase in interactive tasks. Technologies for HR and work organisation and for the processing of large quantities of data simplify administration and the handling of available data. Notwithstanding this, their evaluation and interpretation of such data present employees with new tasks that require relevant cognitive skills. Because there is a decrease in administrative tasks, more time is created for interaction with other employees and/

Figure

Influence coefficients of selected digital technologies on the task requirements index



Source: Additional survey of the BIBB Training Panel 2016, own calculation, dependent variable: Task requirements index, n = 1,765, control for industries, company size, region, participation in training, qualifications structure, investment volume and the proportion of investments in digital technologies. The horizontal lines reflect the 95 % confidence interval.

or customers, thus placing a greater focus on interpersonal activities.

Computer and smartphone use and the use of network technologies such as internet access or email do not exert any significant influence on the task requirements. The reason for this is that these technologies are already present in 95 per cent of the companies, and their use is no longer perceived to be special or demanding. This high degree of penetration is also an explanation for the fact that technologies for data security and data protection do not exhibit any significant effect because they are already deployed in 88 per cent of the companies. Nevertheless, data security is at the same time one of the major issues of the "Smart Industry" because new networking technologies may also offer new points of attack for the circumvention of security measures. This means that in future the focus will be on the degree of security provided by the relevant technologies rather than merely on their presence. This should be a relevant topic of further research. Surprisingly, networking with suppliers does not have any significant effect on the requirements level. There are indications that these technologies frequently appear in typical combinations with other technologies, meaning that their separate effect is not measurable by means of this analysis. Here, as well, further research is needed.

With the exception of the technologies for data security and for networking with suppliers, all Smart Industry technologies, thus, exert a significant positive influence on employees. A continuous rise in requirements is, therefore, to be expected should the degree of use and influence of these technologies be further expanded in the wake of digitalisation.

However, the results from a simple regression analysis such as the one conducted here should not be interpreted as causal. The presence of other omitted variables influencing the task requirements index, which bias the size of the effect of the various technology types, cannot be excluded. Although this problem has already been addressed by controlling for structural differences in the task requirements by industries, company size, region, qualifications structure, participation in training and investment behaviour of the companies, the strength of effects of the respective technologies should be judged with caution. The results merely show an existing correlation (cf. Angrist/Pischke 2008), but still offer valuable indications in this regard.

The machine remains a tool

In summary, the analysis described enables us to confirm that, from the companies' perspective requirements for employees will increase as a result of digitalisation. If computer-assisted tools and technologies for networking with customers, for human resources and work organisation and for the processing of large amounts of data are deployed in the company, employees on average carry out more demanding tasks. In individual terms, this means that employees at such companies perform fewer repetitive routine tasks and more manual, knowledge-intensive and subject-related tasks. Because the use of digital technology already correlates with higher requirements, the expectation is that dealing with complexity will become increasingly important for employees in the wake of digitalisation.

Increasing complexity primarily means that greater significance will be attached to the social and creative intelligence of employees. This concerns tasks in which machines act as tools because, in contrast to repetitive tasks, such activities cannot (according to the current status of technology) be fully taken over by machines. The consequence of this for the debate on digitalisation would be that the complementarity of human and machine should be of focus rather than their substitutability.

The presented results provide valuable initial information on how digital technologies influence the requirements profiles of employees. Quantifying the findings, and analysing the precise scope of the cooperation between labour and machinery, as well as their degree of substitution offer a highly interesting field for future research. ◀

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Modernisation of the IT occupations in the age of 4.0

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BIBB has been investigating whether the four dual IT occupations, which have remained unchanged since 1997, need to be modernised. Against the background of the increasing digitalisation of the world of work, the aims of this process were to identify current and foreseeable requirements for skilled IT staff and to draw up proposals for the future shaping of the IT occupations. This article presents selected outcomes of the investigation and uses this to arrive at conclusions with regard to a possible rearrangement of IT occupations.

Training in the IT occupations

The four dual IT occupations (cf. Table 1) met with considerable demand from trade and industry when they were introduced in 1997. This popularity has been retained down to the present day. Over the past few years, the number of newly concluded training contracts has been around 15,000 annually and has most recently risen to 16,000. Since the launch of the IT occupations, around 250,000 skilled IT staff have been trained for work at manufacturing and applications companies offering products and services in the field of information and communication technology. The IT occupations were a reaction to the boom of the 1980s, which was brought about by the standardisation of hardware and software and allowed new, cost-effective and individually deployable information and communications technology (ICT) to penetrate all sectors of trade and industry. The flexible structure of the IT training occupations resulting from these lines of development was able to meet the differing requirements of IT manufacturers and applications companies (cf. Table 1).

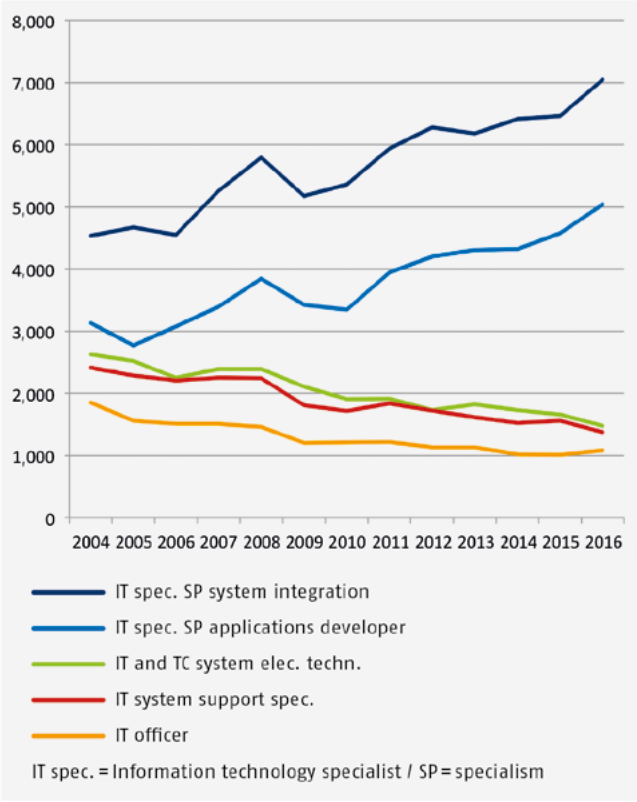
The training occupation of information technology specialist, which offers two specialisms, has increasingly become a sought-after core brand within the IT occupations in recent years. The numbers of trainees entering this occupation more than compensate for the tendency towards a decline in the other three occupations. Between 2015 and 2016, the figures for newly concluded training contracts for the occupation of information technology specialist increased once more by 1,000 to reach a level of over 12,000 (cf. Figure 1).

The development of the Internet of things will continue to drive demand for IT qualifications in all branches. "15 per cent of private sector companies have recruited new staff with digital competences over the last year, and 15 per cent plan to do so by the end of 2018. Moreover the ICT branch

Table 1
The four IT occupations including main task focuses

Training occupation	Main task focuses
Information technology specialist • Specialism of applications development • Specialism of systems integration	 Software development and programming Management and administration of IT systems
Information technology and telecommunications system electronics technician	Installation and repair of IT systems
Information and telecommunications system support specialist	Provision and sale of IT solutions
Information technology officer	Management and administration of IT systems

Figure 1
Newly concluded training contracts in the IT occupations



Source: BIBB survey as of 30 September each year

stands out with its high requirement for skilled workers, amounting to 31 and 43 per cent respectively at these two periods." (BMWi 2016, p. 14). Nevertheless, many companies fear that the shortage of skilled workers is a particular factor which could hinder the progress of digitalisation (cf. BMWi 2016, p. 69).

Estimations on the development of the labour market assume that the need for skilled workers, which is growing anyway, will increase by up to 3.15 per cent more per year by 2030 because of the so-called fourth industrial revolution (Industry 4.0) than it would without this new production structure. Within this process, "37 per cent of the additional demand for IT occupations will take place outside the IT branch in the manufacturing sector" (cf. Hall et al. 2016, p. 6 and pp. 18 ff.).

The rising number of interlinked sensors and actuators in production, software-intensive embedded systems and the digitalisation of whole business processes will continue to heighten requirements in terms of reliability of networks, real-time processing, data security and processing large quantities of data. Although the resultant topics such as software development, cloud computing and big data and the huge issue of IT security are not fundamentally new, but universal and complex application scenarios are leading to new demands being placed on skilled IT workers.

These requirements relate to personal and social competences as well as to the technical area. Skilled IT workers are working in interdisciplinary teams on an increasingly frequent basis, or at least need to deal with contents which are not originally of an information technology nature. They also often work at interfaces and have to communicate with different target groups. "Core cross-cutting skills" such as "willingness to learn, the ability to work as part of a team, flexibility, problem analysis and problem solving abilities and management and project management competences" will become more significant in future, both for skilled IT workers and for skilled workers in general (cf. Aichholzer 2016).

In light of the developments described, the question posed for vocational education and training is the extent to which the existing IT occupations, even given their flexible and therefore adaptable structure, will be able to cover current and future requirements made of skilled IT workers in quantitative and qualitative terms.

BIBB evaluation study

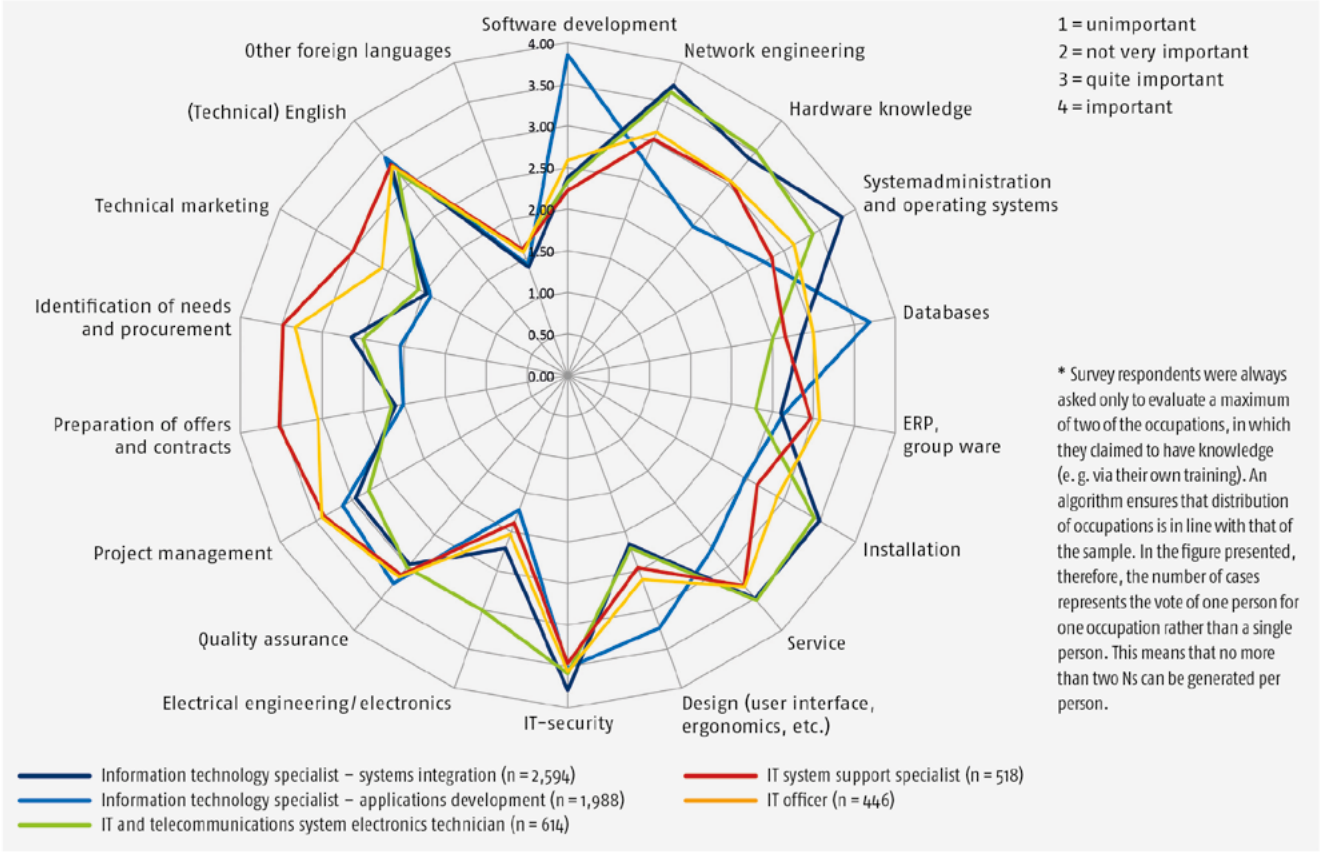
For this reason, the aims of the evaluation concluded by BIBB in 2016 were to identify current and foreseeable requirements for skilled IT staff and to draw up proposals for the future shaping of the IT occupations. The investigation, which was carried out on behalf of the Bundesministerium für Wirtschaft und Energie [Federal Ministry for Economic Affairs and Energy] with the support of an advisory council, followed a three-stage design. This comprised an exploratory phase and phases involving qualitative and quantitative surveys respectively (cf. Conein/Schwarz 2015).

Table 2
Distribution of respondents to the online survey by target groups

Target group	n	%
Trainees	1,767	29.0
Skilled IT workers	1,911	31.3
Training managers	1,237	20.3
Human resources managers, works council members, Young People and Trainee Council members, management staff	748	12.3
Teachers at vocational schools for IT occupations	438	7.2
Total	**6,101**	**100.0**

Figure 2

What role is played by professional competences from the following occupational requirements areas for the work of skilled IT workers?*



The results presented in this article relate firstly to a total of 54 semi-structured guided expert interviews. Trainees, training managers, human resources managers and management staff from ten selected companies were interviewed for this purpose alongside three branch experts, three teachers and three representatives from chambers of commerce and industry. Secondly, the representation is based on the results of the quantitative phase, in particular the online survey. A total of 6,101 cases that were capable of evaluation emerged from this survey and are distributed across five target groups (cf. Table 2, p. 11).

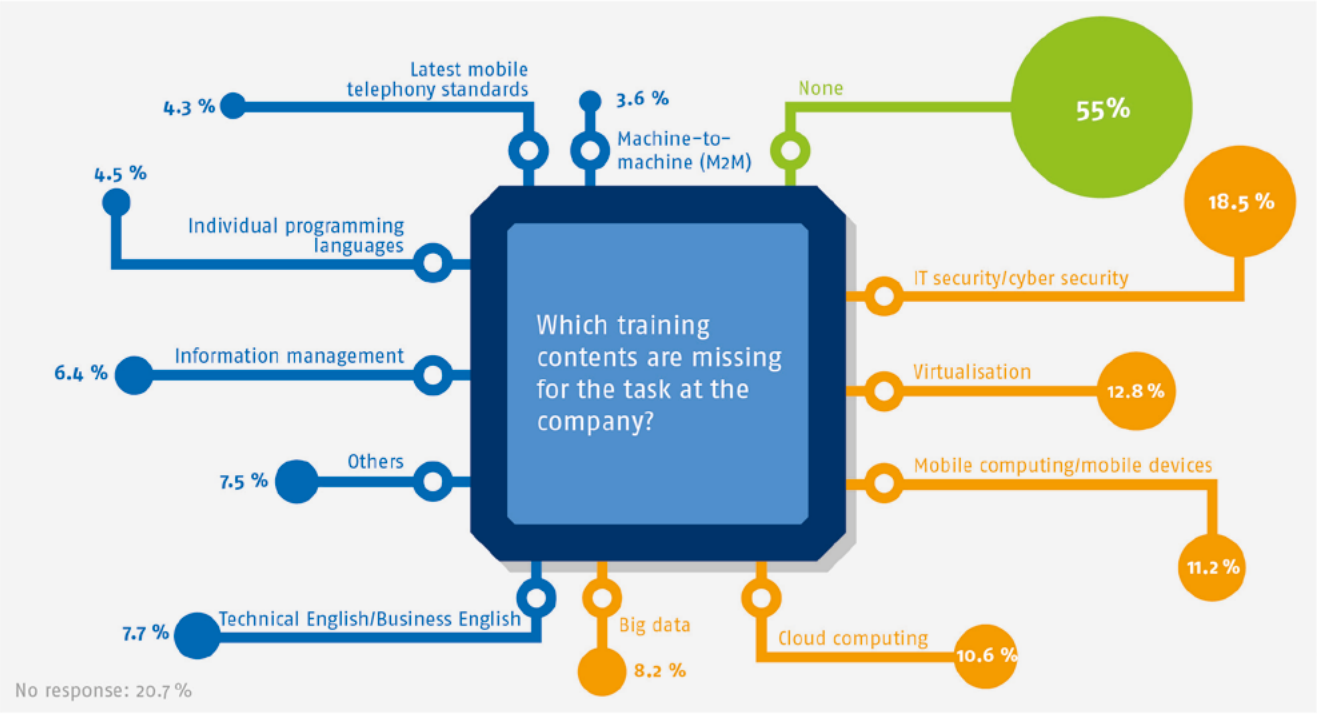
The skilled IT workers interviewed work in all branches. About one third are employed in the economic sector of information and communications, whilst the rest are distributed across virtually all other economic sectors, including eleven per cent from manufacturing industry followed by smaller proportions from public administration, other services and financial and insurance services.

The main focus below is on the results of the BIBB evaluation study, which relate to the urgent need for change in current IT training. These results refer to conceivable amendments to the design of occupational elements and to certain training contents (for further results cf. Schwarz et al. 2017).

Delineation of occupational profiles

Questions about the occupational significance of professional competences in 18 selected requirements areas make it clear that the various occupational profiles demand very different professional competence in some cases whilst exhibiting high degrees of similarity in this regard in other areas. The two specialisms contained within the occupation of information technology specialist (applications development and systems integration) are clearly delineated from one another and are objects of separate demand (cf. Figure 2). The areas of software development and databases, for example, play an essential role for information technology specialists in applications development. Information technology specialists in systems integration mainly require competences in the fields of network engineering, system administration, operating systems and IT security. In overall terms, the profiles have proved their worth. If anything, the indications emerging from the surveys suggest that these profiles should be more strongly separated. Whereas 44.4 per cent of respondents were in favour of retaining the specialisms, as many as 37.8 per cent thought that division into autonomous occupations should take place.

Figure 3
Which training contents are missing for the task at the company?



(n = 5,450)

There are content overlaps between the occupations of information technology and telecommunications system electronics technician and information technology specialist in systems integration, particularly in the thematic fields of network engineering, hardware knowledge, installation and service. The only area in which there is a significant delineation in requirements is the field of electrical engineering/electronics, a more major domain for information technology and telecommunications system electronics technicians. 54.2 per cent of information technology and telecommunications system electronics technicians thought that the two occupations should be combined, whereas only 22.0 per cent of the information technology specialists in systems integration surveyed were of the same view.

There are very large overlaps between the two commercial training profiles of information and telecommunications system support specialist and information technology officer. The only significant variance between the occupations relates to preparation of offers and contracts and technical marketing, where there is a difference of approximately 0.4 points (cf. Figure 2).

Need for change in training contents

Satisfaction with current training content was high in overall terms. More than half of all respondents answered in the negative when asked about missing contents (cf. Figure 3). If missing contents are stated, these primarily relate to topics that play a role in connection with Industry 4.0, such as virtualisation, mobile computing, mobile devices, cloud computing or big data. In this regard, there are only marginal differences across all occupations and between the individual branches.

Regardless of target group, branch or company size, the highest degree of significance is accorded to the topic of IT security: *There are topics which are not yet well represented on the market generally. These include the topic of IT security. Very good experts are already in place, but the quality of training is not keeping up.* (member of management staff)

With regard to the topics of Industry 4.0 and the Internet of things, the interview partners mainly indicate that professional competences and technical knowledge require ongoing situationally-related updating in the face of the increasing complexity and individualisation of production processes.

Yes, [requirements have] changed, *particularly in the area of agile software development, (…) the versatility involved has now become higher and broader. There is also the emergence of Industry 4.0 (…) Before we learned to programme in one programming language. Now programming is also learned in a situationally-related way. This means that I programme to suit the device, i.e. I may use either a traditional programming language such as C or web programming languages like PHP. Then there is also AJAX or Frameworx, which consists of many frameworx that need to fit. So the level of diversity is now greater.* (branch expert)

Personal competences

Respondents certainly attach a high degree of relevance to selected personal competences required for the work of skilled IT workers. On average, these receive higher relevance values than the technical competences.

Particular popularity is given to the competence of willingness to learn, which is evaluated as the most important competence in relation to almost all occupations. This finding is also supported by the results of the qualitative interviews, in which human resources managers and management staff accord great significance to the continuing training of skilled IT workers and also expect employees to pursue corresponding activities in this regard. Conscientiousness, autonomy and results orientation are also considered to be relevant to all occupations. In the case of the two specialisms of the occupation of information technology specialist, particular relevance is also ascribed to the competences of being able to adopt a systematic and methodological approach and to problem solving skills. Communication skills and customer/user orientation are emphasised in respect of the two commercially-aligned occupations. Conflict resolution and decision-making skills tend to be viewed as less relevant across all occupations, and eloquence comes in last.

None of these results are surprising in any way and further support the call for personal and social competences to be imparted, including and particularly within the information technology occupations.

Recommendations

IT occupations are both sectoral occupations for the ICT manufacturers and providers and cross-sectoral occupations which are used by the users and customers of ICT solutions. They are also interface occupations which combine information and communication technology with production technology and business management. The increasing digitalisation of all economic sectors will bring about a strong growth in the number of networked and interacting systems and will therefore further increase the complexity of these interface functions. Skilled IT workers primarily work in a project-related way within an environment in which requirements change. The view of the experts surveyed is that personal and social competences will become even more important in future alongside professional competences.

The available results suggest that the IT occupations should undergo revision in respect of contents and structure:

- The following recommendations may be made with regard to the design of the occupations. The two commercially-aligned IT occupations of IT system support specialist and officer should be merged due to the fact that they exhibit very strong overlaps. The two specialisms within the occupation of information technology specialist should be dissolved into separate occupations, because there is a clear difference between their profiles and demand continues to be very large in overall terms.
- Two thirds of skilled IT workers are employed in branches outside the ICT sector, including in the manufacturing industry. With regard to the topic of Industry 4.0, consideration should be accorded to establishing content such as production management, virtualisation and embedded systems more firmly into the training areas of applications development and system administration.
- The topic of IT security (data security, availability, data integrity and data protection including legal aspects) should be significantly strengthened. This should take place via a fundamental cross-occupational understanding of issues relating to IT security and secondly via occupationally specific contents (e. g. risk analysis, protection of hardware and networks/infrastructure, encryption, rights, legal requirements, certification, training).
- Personal competences should be accorded comprehensive consideration within the training contents.
- In order to take account of the increasing complexity, heterogeneity and speed of change of the requirements, differentiations in the form of elective qualifications should be introduced (for more information on the possibilities of elective qualifications cf. also Schwarz et al. 2015, pp. 67 ff.).

These and other proposals are currently being debated by stakeholders involved on both the employer and employee side with a view to rearrangement. ◀

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Initial training for the digitalised work

Example: skilled workers supporting production in the automobile industry

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The digitalisation of work in the high-tech areas of the automobile industry and of the automobile supplier sector is a good example of the change in task and requirements profiles for skilled workers in engineering and plant construction. Within the scope of a pilot project, BIBB joined forces with the Volkswagen Academy to undertake a sample investigation of work tasks and activity profiles in the areas of operation, maintenance and repair of production systems. These were compared with existing training occupations and current training practice. After a brief description of the approach adopted, the article states the results which emerged and draws conclusions for possible changes in the structuring of training within the framework of existing occupations. It concludes by illustrating how these changes are presently being implemented on a step-by-step basis.

The VW-BIBB pilot project

The aim of the cooperation between VW and BIBB was to investigate existing training and matchability of the corresponding training occupations and regulatory instruments in order to derive recommendations for regulatory work and the structuring of training.

Participatory observations of training and attendant work processes were carried out at five automobile locations, and interviews were conducted with training managers, production and maintenance managers and skilled workers. Group discussions and workshops were also used to generate results and for the purpose of validation. Finally, the results were summarised and documented (cf. Zinke et al. 2017).

An activity profile for an operational maintainer was described before the first interview began, and this was used as a reference framework and defined in more precise terms during the course of the investigation (cf. Information Box, p. 16). This enabled the following to be defined.

- Which changes are required in typical access occupations
- Which shifts arise for the necessary competences
- Which conclusions can be drawn with regard to the structuring of training.

Information technology determines the tasks of the skilled workers

Work processes for maintenance are determined by information technology applications. In the maintenance of automated systems, IT applications play a major role via sensor technology, networking, data capture and evaluation IT-aided documentation, process monitoring and process control. The rules of maintenance are shifting from a cyclical to a continuous procedure. This can increase the useful life of plants, plant parts and components, and reduce the frequency of malfunctions. Skilled workers responsible for maintenance also take on tasks to secure ongoing plant operation at the same time. In order to ensure the maximum possible running time of plants per shift, day and week, the preference is to exchange plant parts, components and elements for the purpose of repair or the remedying of malfunctions and to replace these with structurally identical units. Repair and maintenance then take place outside the plant and do not necessarily need to be performed by the skilled workers on site.

The employability skills of the operational maintainer have their foundation in competences such as comprehensive IT-based system understanding, the handling of systematic error diagnoses, problem solving strategies and anticipatory action.

IT-assisted trouble shooting and error diagnosis are central stages of action within the setting of the work tasks of

Task profile for skilled workers in operational maintenance and process support

- Analyse, diagnose, monitor, extend, amend and parameterise production networks.
- Carry out IT-assisted error diagnoses on systems and sub-systems within complex automation plants, identify, allocate and check functions and components.
- Maintain, repair, extend, test and commission production plants (and control systems).
- Check interfaces and components.
- Model and sketch out network structures.
- Capture and administer operational data.
- Develop visualisation systems and guides.
- Exchange, wire up and integrate electronic components (sensors/actuators/drive systems).
- Exchange and expand IT hardware and integrate into systems.
- Apply digital control technologies.
- Use technical information systems.
- Use (amend/administer), structure and manage IT-assisted documentation systems, archive data.
- Install and dismantle mechanical sub-assemblies.
- Coordinate with third parties, induct and instruct auxiliary workers.

operational maintainers. Social and personal competences are a necessary prerequisite for professional action and are continuing to gain in significance in terms of performing these tasks. Self-direction, autonomy, the ability to work as part of a team, and communication skills are all in demand.

The need for change to regulatory instruments

In terms of individual contents, a comparison of these requirements with the existing regulatory instruments for the training occupations of mechatronics fitter and electronics technician for automation technology showed only partial matchability in each case. Although their accentuations differ, neither occupation is as yet sufficiently suitable to correspond to the task profile. The comparison also reveals that scope of content and necessary competences for information and communication technologies are not adequately reflected in the regulatory instruments. For mechatronics fitters, for example, network and bus system technology do not form an object of training within the general training plan (company) until the third year and are not even included in the skeleton curricula used by the vocational school. In terms of implementation at the learning venues, this topic is only accorded subsidiary significance in many places. Additional compaction of the structuring of training is discernible as a result of the shortening of the training period in company contexts.

In the interviews, the representatives of the specialist departments perceive matching problems in two directions in respect of the questions of suitability of the training occupations and whether those completing such training were properly equipped for work in operational maintenance:

1. Matching problems in respect of individual professional competences within the occupational profile, which have thus far not formed a sufficient object of the general training plan (e.g. network technology, robot handling, bus systems).
2. Matching problems relating to competences which represent fundamental changes in the approach to troubleshooting and system understanding (different error diagnosis and problem solving competence, the way in which IT systems and data are handled and basing thought processes on the software).

The project team also thought that the scheduling and didactic structure of the training neglected the development of system understanding and of problem solving skills, and thus constituted a further deficit. Training commences by imparting the "basic principles" of metalworking technology and electrical engineering by means of a course of instruction, and system understanding does not form an objective until the end of the process. The general training plans thus set out an inductive teaching/learning concept that begins with the relaying of solitary areas of knowledge and skills, such as the basics of metal and electrical technology.

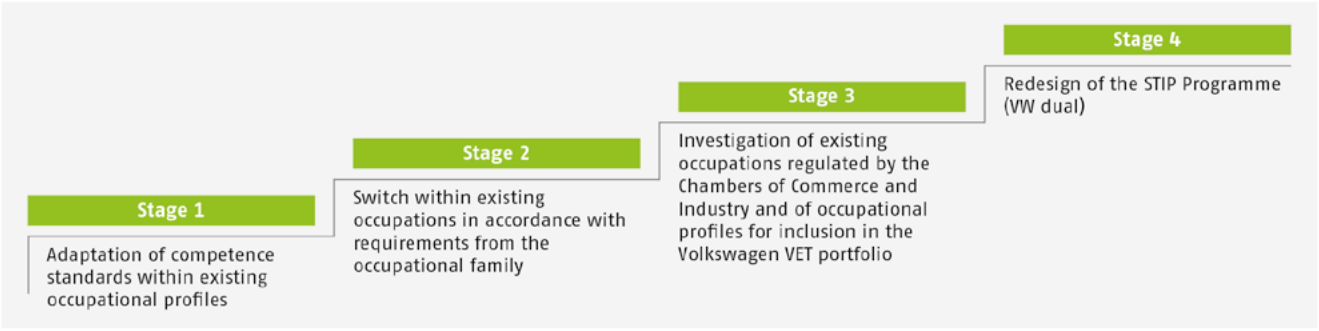
If we assume that certain action patterns and modi operandi are marked out as soon as training begins and that the foundations of future occupational identity are laid during the first year of training in particular, then a change to the approach adopted may achieve an optimisation of training.

Conceptual shift in training

A crucial prerequisite for understanding systems is a holistic approach which encompasses the interplay between mechanical, electrical and information components and sub-systems. To this extent, it is necessary to adopt a different didactic procedure which takes the system as a whole as its starting point and places this at the commencement of the training. This means we require a conceptual shift from an inductive to a deductive approach.

If, for example, a mechatronic system is included as a model at the start of training and this is initially used to explore, analyse and amend functionalities and sub-assemblies, the systematic thinking that is a prerequisite for problem solving skills, trouble shooting and ultimately for overall professional action will be able to emerge. Such an approach also enables the curiosity and motivation of trainees to be fostered and strengthened in a significantly better manner than via a basic course in metalworking technology. The possibility of using IT technologies, tablets or hand-held

Figure
Control process for the updating of company training at Volkswagen



Source: Volkswagen AG

devices in this process ties in with the media habits of the trainees in their own life world. The interaction of virtual and real processes and sequences is a problem which is addressed and brought alive at the very outset of training, and this creates the foundations that are actually needed for mastery of future occupational work tasks.

The relevant training regulations for the occupation of mechatronics fitter and for the group of the industrial electrical occupations entered into force in 1998 and 2003 respectively.* Updates to these are currently not anticipated. This makes it even more important for companies providing training and for vocational schools to scrutinise at the implementation level whether the way in which they are structuring training meets future operational requirements and to upgrade this structure.

Implementation activities and experiences from the point of view of the stakeholders

The joint pilot project undertaken by BIBB and the Volkswagen Academy provided additional support to change processes which were already ongoing in Volkswagen training. The project management group, which included the heads of training for the group's brands in Germany, and two cross-brand groups comprising expert trainers served as vehicles for regular networking on approaches and outcomes during the term of the project.

Measures for ongoing adaptation

Vocational education and training at Volkswagen is governed by competence standards that are stipulated by company training management on the basis of national regulatory instruments. These competence standards link the requirements contained within the general training plans of the respective occupations with Volkswagen-specific requirements defined by the relevant specialist departments. A control process also takes place, via which steps to refresh and update are implemented across locations (cf. Figure).

This procedure initially involves identifying new technologies and resulting work tasks, which are mapped against the occupational profiles and competence standards (Stage 1). If necessary, occupational profiles are adapted and new learning contents are integrated into the relevant competence standards. The prerequisite for this is extremely good cooperation with the various specialist departments. This process has gained even greater significance within the scope of the digitalisation of the world of work. During the most recent updating procedure in the training occupation of electronics technician for automation technology for example, which took place in 2016, 34 competence standards were revised or added. This represents a change to almost 25 per cent of training contents.

Increasing networking between industrial plants means that further changes are in the pipeline in this occupation in particular. This is also associated with the objective of the specialist departments to increase the IT competences of electronics technicians for automation technology and mechatronics fitters. New concepts and technologies, such as maintenance by condition monitoring, virtual commissioning of industrial plants for the avoidance of production downtimes, camera technology for the identification and positioning of components, databases and networking technology are therefore all being introduced into VET in order to take account of the future requirements of the specialist departments.

A further measure is regular adaptation of the quantities of trainees in the respective occupations (Stage 2). One discernible trend is a significant proportional shift away from metal technology occupations (e.g. tools mechanic) towards occupations with a greater focus on IT competences, such as mechatronics fitter.

The results which have emerged from the BIBB-VW pilot project have made it clear that the integration of new con-

* Training regulations for the occupation of mechatronics fitter underwent a partial updating in 2011 in respect of the examination model. In 2007, the regulatory instruments governing the industrial electrical occupations were converted from a pilot ordinance to a full ordinance.

tents into VET in individual occupations and quantitative changes to training figures per occupation are not fully sufficient in terms of continuing to meet the challenges of digitalisation and that further steps appear to be necessary. One particular area of focus is the expansion of software competences. From the point of view of the training managers, this may lead to further changes in the portfolio of training occupations (Stage 3). The occupation of IT and telecommunications system electronics technician may, for example, represent a useful future addition to the training occupation portfolio at Volkswagen.

Within this context, the programme for dual students also needs to be investigated alongside VET (Stage 4). The so-called "VW dual Programme" is currently in the design concept phase. Its aims are to prepare dual students for future requirements in a better way and to integrate them into internal company human resources development.

Didactic reforms within the scope of the "DigitalXperience" initiative

Changes to the pedagogical and didactic approach adopted within training are also required. Training is currently undergoing extensive restructuring via the use of tablets, videos, training apps, e-books and web-based trainings (WBT).

The initiative "DigitalXperience – digitalisation of VET" has been instigated for this purpose. DigitalXperience acts as a holistic process to link the changes in VET within the group with the change process and with training for the trainers themselves. The launch of the campaign initially facilitated and fostered networking between stakeholders via the vehicle of digital media. Special user groups have set up a type of VW Facebook for VET on Volkswagen's internal "Group Connect" system. This was followed by a series of awareness and training formats aimed both at training staff and trainees.

Existing standardised teaching documentation has been digitalised and made available as WBT, video material or apps. This was backed up by the launch of a pilot project on the use of tablets in order to encourage mobile learning in VET. The resultant positive experiences show that the present generation of trainees are very accepting of these new forms of imparting training and indeed expect such an approach from a modern company training provider.

One works model, which up until now has been deployed at a single location, is currently being integrated into training at other locations. This involves using relevant learning and work remits in projects and small cross-occupational and cross-cohort groups as a basis for developing and enhancing models for process automation. Measured against the course of training, this will enable trainees' problem solving skills and system understanding to be developed earlier, in a more concentrated form and in a different methodological manner.

A competition calling upon trainees from all production locations to create either a teaching video or a video about the structuring of VET in the year 2025 from the point of view of the trainees will be hosted in the spring of 2017 in order to promote their media competence and encourage them to address a specialist topic. Involvement with the contents to be imparted enables strong consolidation of this knowledge by trainees.

The role of training staff will alter in the wake of these changes. They will open up learning pathways and assist trainees with learning processes by acting as coaches and support agents who also make learning packages available. In order to be able to drive forward the digitalisation of VET in a holistic manner, investments in VET facilities will, of course, also be required.

Using areas of company structural potential in training

Digitalisation will bring about wholesale change in VET. Within this context, the BIBB-VW project was an important building block in terms of advancing, improving and upgrading VET in the VW Group. At the same time, the project provides insights into training practice and shows how further development of VET can be achieved in the short term within the scope of the existing regulatory instruments and that initial changes can represent a response to digitalisation.

In the view of the authors, the approaches and initiatives presented are capable of being transferred to other companies providing training, including to smaller firms. Company and training managers will act as process drivers in this regard.

Trainers also need to remain on board. Continuing training for training staff is essential to the success of these initiatives. They also need to be given the opportunity and motivation to help actively in shaping the change process in VET. Greater consideration also needs to be accorded to the different learning behaviour of a "new" generation that has grown up with digital media. The trend is clearly moving away from "omniscient training staff" to "learning support". ◀

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Media-pedagogical competence of company-based training staff

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Opportunities to deploy digital media for the initiation and support of vocational teaching and learning processes are comprehensive and diverse. The associated challenges for company-based training staff are currently being investigated within the scope of the BIBB research project DiMBA. This project is based on a model of media-pedagogical competence which is presented in this article.

Background information: The DiMBA research project

The requirements being placed on company-based training staff are greater than ever. They ask for a targeted approach to addressing the opportunities of delivering vocational education and training in a way that is supported by digital media. They need to develop relevant concepts and implementation scenarios within the context of their respective training remit. At the same, the media ensemble of trainees is very much shaped by digital media. This requires an ability on the part of the company-based training staff to have a clear view of and to evaluate the functionalities and possible areas of deployment of digital media (learning software and platforms, social media, tools, apps, e-books etc.). Providers, vested interests, opportunities and risks, restrictions, development trends and other aspects need to be subjected to critical evaluation in order to create a basis for a well-founded selection of digital media to increase the quality and efficiency of vocational education and training. Such appropriation of digital media is not self-evident and requires relevant competences.

The BIBB research project "Digital media in vocational education and training – media appropriation and media use in the everyday practice of company-based training staff" (DiMBA) is investigating the challenges faced by company-based training staff in this regard. The main issues are as follows:

- How do company-based training staff select digital media for everyday initial and continuing training practice?
- How are digital media integrated into initial and continuing training processes?
- What support do company-based training staff require in order to be able to integrate digital media into training in the best possible way?

These questions are being investigated via a cross-domain approach in the occupations of vehicle mechatronics technician, management assistant for retail services and geriatric nurse.

Model of the media-pedagogical competence of company-based training staff

The basis for the investigation is the development of a model describing the necessary media-pedagogical competence that training staff should possess in order to integrate digital media into vocational training processes. The first stage of the development is to analyse existing approaches towards media-pedagogical competence from the K-12 education (cf. Blömeke 2000; Herzig 2007; Tulodziecki/Herzig/Grafe 2010) and evaluating these with regard to suitability for vocational education and training practice. The result was a prototypical draft model of media-pedagogical competences of company-based training staff which had its foundations in models that had already been the object of empirical evaluation. In the second stage of the process, this prototype was investigated via the outcomes of expert interviews conducted with academic researchers from the field of VET and with training staff from the domains stated who were familiar with using digital media. On the basis of the findings, the prototype was developed further to create a model which permits a differentiated and cross-cutting consideration of media-pedagogical competences.
The model comprises the three components of "media didactics", "media education" and "media integration", all of which correlate with one another (cf. Figure 1, p. 20). The media-pedagogical competence of company-based train-

Figure 1
Components of the media-pedagogical competence of company-based training staff

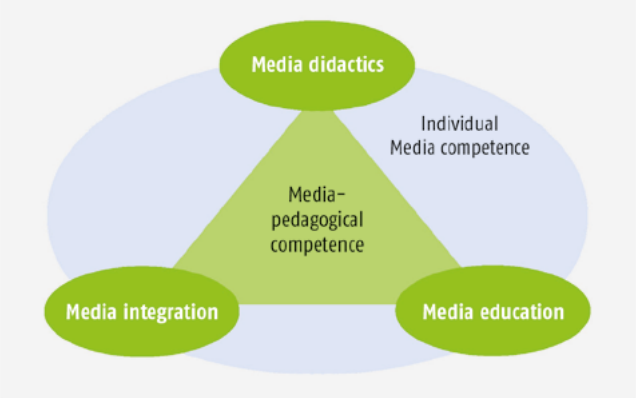
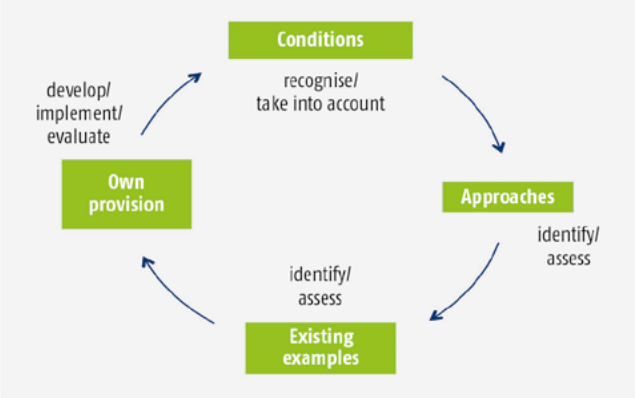


Figure 2
Process elements of media-pedagogical competence appropriation



ing staff is driven by the individual media competence of the trainer, i.e. basic competences in media use and design, media theory and media criticism (cf. Baacke 1999). Although media-pedagogical competence develops pursuant to the conditions of individual media competence, it is by no means the same thing.

The component of "media didactics" encompasses the didactically justified deployment of digital media to support teaching and learning processes. "Media education" refers to the perception of media-related education and training tasks, and the element of "media integration" denotes the incorporation of media-pedagogical concepts into a company's governance. These components enable media-related and pedagogical actions in VET practice to be described in a structured and precise manner and, in particular, permit the direct derivation of specific practical relevance.

- *Media-didactic actions* include such aspects as the identification and selection of visualisations, simulations and animations which are suitable for training.
- *Media-education actions* are, for example, displayed in addressing the topic of ethical aspects of media use, such as initiating and communicating appropriate measures to combat cyber bullying.
- *Media-integrating actions* encompass elements such as involving the works council and company data representatives when introducing a learning platform.

The model maps the acquisition of media-pedagogical competence as an ideal case scenario. The individual process elements of "conditions", "approaches", "existing examples" and "own provision" interlink and indicate the possibility of the continuous development of media-pedagogical professionalism (cf. Figure 2). The fact that the process elements are related to the individual components of media-pedagogical competences now enables the latter to be further differentiated and operationalised. In the area of "media didactics", for example, the conditions for media-didactic actions need to be initially recognised and taken into account before approaches towards and examples of media-didactic actions are subsequently identified and evaluated in order to be finally able to create a basis for the development, implementation and assessment of the company's own provision. The findings and experiences emerging from this process then once more inform the cycle, which in principle may be repeated as many times as necessary. The same applies to media education and media integration.

Outlook

The model of media-pedagogical competence was used to design a survey on the current use of media by company-based training staff, and this was implemented in the form of an online questionnaire during the period from May to October 2016. ◀

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The revised UNESCO Recommendation on Technical and Vocational Education and Training is of interest to all of us!

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In April 2016, UNESCO adopted a document which underlines the growing global significance of vocational education and training (VET) and represents an important milestone in terms of increasingly aligning the quality of VET to the requirements of the world of work. This article outlines the background and the process behind the development of the recommendation and defines its main contents with regard to practical relevance.

Starting position and objective

Fifteen years after the last version (2001), the United Nations Educational, Scientific and Cultural Organization (UNESCO) publicly presented its revised Recommendation Concerning Technical and Vocational Education and Training in April this year. The recommendation had already been unanimously adopted by the member states at the UNESCO General Conference in November 2015 together with the content-related Recommendation on Adult Learning and Education.[1] The mandate for the revision was enacted at the 37th UNESCO General Conference in 2013. Within two years, a new draft was successfully drawn up and agreed with the member states. The draft recommendation was initially developed by a group of international experts before being coordinated and finalised by the member states within the scope of a multi-stage consultation process.[2]

The updated document now globally strengthens the alignment of initial and continuing vocational education and training to practically related models with the involvement of the companies. At the same time, a further aim is to provide young people and young adults with attractive learning, development and employment opportunities.

The previous version from 2001 was strongly geared towards school-based learning processes and associated input factors. This meant that the focus was mainly directed on school teaching staff. However, reforms aimed at strengthening company-related and practically-oriented vocational education and training have been taking place in many emerging and developing countries since this time. Furthermore recent developments in the world of work and with regard to the importance of lifelong learning and emergence of qualifications frameworks had to be taken into account.

Main contents

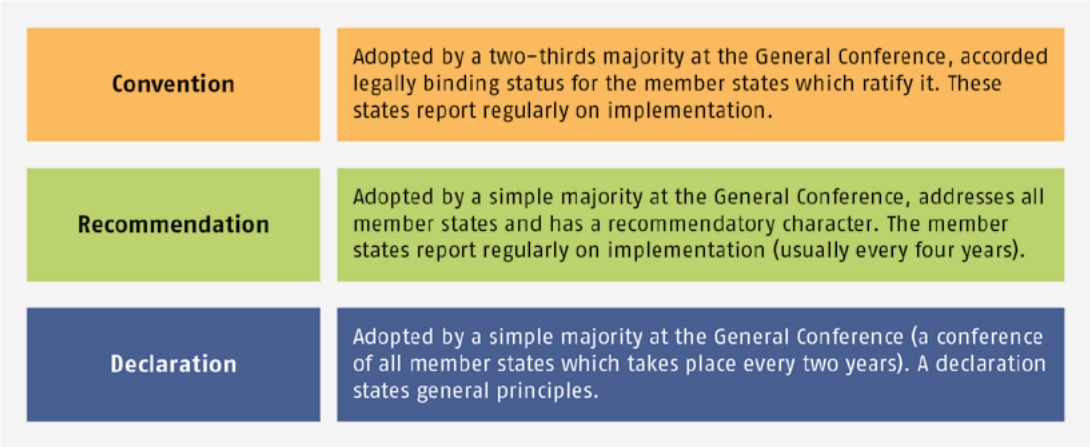
The recommendation covers five main thematic areas in detail. These are policies and governance, quality and relevance, monitoring and evaluation, research and knowledge management and international cooperation. There is a clearly discernible understanding that VET encompasses initial and continuing training and extends into the tertiary educational sector. The importance of work-based learning is emphasised, and a holistic view of competencies incorporating professional, social and personal competence is adopted. The revised recommendation also presents an expanded definition of VET staff, a term which now extends beyond teachers at schools to include company-based trainers, tutors, mentors and other persons entrusted with providing company-based training, and upgrades the role of such persons.

The connection between VET and the labour market is underlined, and the private sector is integrated into the structuring and financing of VET via public-private partnership models. The intention is for both employer representative bodies and the trade unions to be involved in the development of vocational training via dialogue-based processes and instruments ("social dialogue"). The significance of research into VET-related topics has been explicitly incorporated into the recommendation in order to observe developments, identify changes and create as solid a database as possible for policy decisions. Research on VET shall be promoted and expanded worldwide. Member states are

[1] Cf. http://unesdoc.unesco.org/images/0024/002451/245118M.pdf (retrieved: 07.09.2017)

[2] On behalf of BIBB, Head of the Research Prof. Dr. Reinhold Weiß and the author were members of the group of experts.

Figure
Summary of UNESCO's normative instruments



recommended to use or establish open-data information systems in order to align vocational education and training more closely to the needs of the world of work. They continue to be urged to improve quality assurance in VET.

In order to support international cooperation and networking, the UNEVOC Network at the UNESCO International Centre for Technical and Vocational Education and Training based in Bonn is to be strengthened in its capacity to act as a multilateral platform for cooperation and peer learning. According to information supplied by UNESCO-UNEVOC, about 240 institutes currently belong to this worldwide network. In Germany, BIBB and the UNEVOC Centre "Vocational Education and Training for Sustainable Development" in Magdeburg are members.

Relevance and categorisation

The revised recommendation now provides a normative instrument which can serve as a reference framework and document within international cooperation and for the further development of vocational training in every member state and is also able to support relevant reform processes. Ongoing globalisation of markets, technological innovations and demographic developments in industrialised, emerging, and developing countries are all requiring adaptations to the vocational education and training of the member states.

Many of the contents of the recommendation are in line with the German notion of dual VET and the associated key principles. Other aspects make it clear that the characteristically German concept of social partnership cannot provide a global blueprint. Many states are struggling with such a design. For this reason, the term "social dialogue" has been adopted as a compromise formula which at least stipulates the participation of trade unions and employer organisations in the structuring of vocational education and training in some form or another.

What is the potential significance of the recommendation at the practical level? In formal terms, the document serves as a recommendation and, unlike a Convention when ratified by the member states, does not constitute a legally binding norm. It is, however, the second highest normative instrument which UNESCO has at its disposal (cf. Figure).

A recommendation is aimed at all member states and therefore needs to strike a balance between the various starting positions in developing, emerging, and industrialised countries. Given this restriction, it is understandable that some formulations are vague in nature. This makes it even more important that the revised recommendation underlines the fundamental significance of work-based learning, even if such a concept is implemented in many different variations in practice.

The General Conference has called for the recommendation to be disseminated amongst the major stakeholders and within the respective (VET) education communities and for suitable support measures to be put in place. The plan is for an implementation report to be made no later than at the 2019 General Conference. From a German point of view, it is already clear that a considerable contribution can be made in this regard. A great deal of data and information on German vocational education and training are already available. If implementation is linked with the sustainability goals (SDGs) of the United Nations, further synergies can be exploited (in particular those relating to Sustainable Development Goal 4 ("ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"). In order to support the effectiveness of the UNESCO Recommendation, the focus is now on establishing (greater) awareness at national level and on its consideration within the scope of international cooperation. ◀

Translation from the German original (BWP 5/2016): M. S. Kelsey

Issues for the future of vocational education and training

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In looking at issues for the future of VET, we are conscious of the fact that many topics relating to the further development of the dual system have a long tradition. The four topics that I will examine in greater detail below – digitalisation, matching problems on the training market, integration of refugees and internationalisation – do not, therefore, pose any questions that are entirely new. Nevertheless, it is necessary to localise these issues in the present and the future. This means clarifying their current relevance for the profiling of vocational education and training and the associated process of illustrating prospective action options.

Using the opportunities offered by the digital shift

The digital shift is accelerating the constant structural change being brought about by technical progress. Employers and employees are both being confronted with changes to work tasks and skills requirements, some of which have been of a fundamental nature.

However, the latest academic research findings and experiences from practice tell us that digitalisation is linked with an opportunity to strengthen the attractiveness of initial and continuing vocational education and training in Germany. It seems important to recognise and seize this opportunity.

In order to do so, developments identified at the system level need to be addressed at the earliest possible stage and implemented within modernised or new initial and advanced training regulations. Within the scope of vocational orientation at schools and guidance services at Job Centres, we need to succeed in stimulating young people's interest in VET in the context of digital work. And when it comes to structuring future-oriented company-based training, the competent bodies will have the task of supporting small and medium-sized enterprises in particular in identifying and implementing their own company digitalisation strategy. Within this process, it is important to create the kind of general conditions that will enable dual training to remain an attractive prospect for SMEs under the changed requirements brought about by digitalisation. This will be particularly successful if firms providing training take the vocational education and training system into account in a systematic manner within the process of finding and realising their own company digitalisation strategy and prepare company-based training staff for the new tasks and requirements of dealing with digital learning arrangements.

In trade and industry and in society, digitalisation is perceived as a shift which is associated with uncertainties. However, regular prognoses of the quantitative and qualitative requirement for skilled workers may help to highlight conceivable developments and thus also create the necessary security by making possible consequences of the change an object of planning and preparation.

But a degree of risk taking and experimentation is also necessary. This may, for example, involve:

- linking VET with the imparting of additional qualifications,
- having the foresight to include new training occupations in company-based training, changing or re-interpreting an existing general training plan in the current context,
- providing greater flexibility in terms of scheduling and organisational structure by using new teaching/learning methods,
- granting learners more activity and autonomy in the learning process and using learning environments that have been virtually enriched to a higher degree in order to support them in becoming familiar with more complex demands.

Countering matching problems with attractive training places

Matching problems on the training market lead to a situation in which relatively high numbers of training places remain unfilled at a national level whilst a multitude of training place applicants remains unplaced.
Given the current supply situation, one way of reducing matching problems would be to bring about a significant strengthening of the occupational flexibility of young people. Vocational orientation provision which enables young people to focus more on the broad spectrum of available occupations would be an initial step in this direction. At the same time, we could increase the attractiveness of training occupations by designing occupations in a wider way without relinquishing specialisations. The concept of occupational groups and occupational families offers options in this regard and should be used much more robustly than in the past. Young people wish to keep as many options as possible open when they enter the first phase of their training. The narrower and more specialised an occupational field is and the fewer recognition opportunities associated with a vocational qualification are, the less attractive they will find the occupation. Representatives of the professional associations and all those involved in re-regulation procedures need to take this into account. Secondly, with regard to the unfilled training places, there needs to be a particular focus on small companies and the smallest category of companies. Although such firms have previously been the backbone of the German training system, they are increasingly withdrawing from training in light of the growing problems in filling places. If we wish to mitigate or even halt this trend, we need to initiate more wide ranging considerations. In order to win out in the competition against major companies or institutes of higher education and boost numbers of young trainees once again, the smallest companies should adopt approaches such as pooling resources and creating strategic alliances on their respective specialist markets. This is the only way of successfully compensating for disadvantages that are caused by company structure and of operating a policy for recruiting young talent that is used by as many small firms as possible. In order to realise this, however, support is needed from a self-organisational model which provides assistance, services and direction. This involves network management and the right back-up from the chambers, district craft trade associations and guilds. Initiatives which generate new and innovative impetuses in the regions are indispensable in this regard.

> "In order to alleviate matching problems, we need to turn our attention to the development of attractive occupational labour markets which offer regional career prospects."

Professional qualification creates integration

In 2015 and 2016, around 1,170,000 persons migrated to Germany in search of protection and were registered as asylum seekers. There is no doubt that educating and training these new arrivals and preparing them for working life in Germany or in another country constitute central societal tasks which are currently creating major challenges for the educational system and for trade and industry. The crucial factor, both from a qualitative and from a quantitative point of view, will be to put appropriate provision in place that accords due consideration to the different prior learning and life situations of the refugees.
Only small numbers of (young) refugees have entered the training system thus far. The high language requirements of the training programmes are the main hurdle here. However, young refugees are significantly more likely to take part in vocational orientation and vocational preparation measures. Coherent, internally differentiated and flexible provision is particularly required in order to avoid once more producing a system of waiting loops. In specific terms, this means:

- abandoning the large number of individual measures and aspiring to longer term regular provision which ensures ongoing support and assistance and fosters language skills in every regard;
- managing cooperation between educational institutions and stakeholders at a local level via local government coordination;
- expanding second chance training leading to a vocational qualification for refugees aged over 25 in particular.

For this purpose, the whole of the funding system should be scrutinised in order to identify the extent to which existing regular provision can be opened up. The Federal Government-Federal States-Federal Employment Agency Support Group is making an important contribution towards a harmonised funding policy within the scope of the Education Chains Initiative.
Alongside these funding measures, the labour market-related training delivered by the dual system also offers great integration potential. It is able to build a bridge to the world of work and to society, especially in circumstances where the practical side of training creates friendly family-style links for the trainees. This is particularly possible to achieve in smaller craft trade companies. The results of a BIBB survey of SMEs in selected occupational areas prove that small and medium-sized companies display a high degree of willingness to train refugees. As early as the first

quarter of 2016, one in ten SMEs had taken the initiative by offering practical placements or training places to refugees. However, the companies are also signalling that assistance is required, particularly with regard to supplementary provision to offer individual help and learning support.
Introductory training and assisted training are instruments which are already being used and which should continue to be deployed to a greater extent.

Future issues in an international context

Migration and flight are not the only things which have changed our society. Globalised markets and worldwide networking via modern information and communication technology have long since ensured that the exchange of goods, knowledge and experiences no longer stop at national borders. Despite the fact that national educational systems exhibit differences in some respects, issues for the future of vocational education and training are being dealt with at an international level. This is frequently to the benefit of all those involved.
The programmes and strategic processes of the European Union are playing a central role in this regard. Firstly, they provide a framework to learn from and with one another at the various system levels. They are also facilitating the reaching of agreement on transnational educational policy objectives and their implementation.
For many EU citizens, learning across borders is becoming a reality via the mobility programmes offered within the scope of Erasmus+. These enable learners and teachers from the member states to undertake a stay abroad. Funding numbers in vocational education and training have more than doubled since 2009 and have even increased six fold compared to 2006. From a domestic point of view, this is a welcome tendency which needs to be continued. Nevertheless, it should be stated that vocational education and training still has a lot of catching up to do compared to other educational areas. For this reason, targeted incentives need to be put in place with regard to all three learning venues – companies, schools and inter-company institutions – in order to lend greater emphasis to networking.
The main focus of strategic processes initiated in recent years has been on combating youth unemployment. Both the EU and UNESCO, the latter in its revised recommendation from 2016, are placing their faith in the model of work-based learning. This is perceived as offering considerable potential for the resolving of structural problems and for strengthening economic and social development in many countries, particularly outside Europe. And demand is high!

Since the establishment of the German Office for International Cooperation in Vocational Education and Training (GOVET) at BIBB, both the Federal Government and German VET stakeholders have expanded their commitment in numerous countries within and outside Europe. They are making valuable contributions to the development of high-quality vocational education and training provision and are working on strategies to structure VET systems which provide VET in line with economic needs. GOVET implements and provides advice to the bilateral BMBF Cooperation agreements and consultancy projects which are currently in place with five European and thirteen non-European countries.
However, dealing with vocational training in an international context also requires consideration of the tertiary educational sector. Educational provision attributable to this sector is expanding as a response to the growing complexity of work requirements, and it is an area which is indeed undergoing considerable growth. There is a particular rise in demand for provision which links vocational training with general or academic education, fosters permeability and thus offers new educational opportunities by opening up access points. In light of these developments, the question as to the importance of advanced vocational training in an international context once again arises. In future, such training will need to hold its ground against dual and in-service courses of higher education study in order to have international connectivity. Its status is also significant because the opportunities it provides for advancement and career progression contributes to the attractiveness of vocational education and training in overall terms. This finds particular expression in the fact that advanced training programmes are aligned to levels 5, 6 and 7 in both the European and German Qualifications Frameworks. Vocational training pathways across all educational levels will only become an alternative to general and higher education for high-ability young people if such a route offers career opportunities without needing to be supplemented by a higher education qualification.
Extensive debate on these and other topics with international cooperation partners needs to continue to take place in future. In this regard, responses to questions on the prospects for vocational education and training also always take on a global dimension! This is precisely why it will remain particularly interesting to continue to look at these topics. ◀

> "In order for training to be capable of building bridges to the world of work and to society, we need to view it as a long-term investment in integration in Germany."

Translation from the German original (BWP 3/2017): M. S. Kelsey

The training occupation as the basis for lifelong learning in the employment biography

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Vocational education and training in German-speaking countries is traditionally aligned to the concept of the training occupation. Both the precise nature of this concept and the requirements made of it have regularly shifted in the past. The present article provides an overview of this development and describes current action areas with regard to structuring the training occupation in a future-oriented way so as to serve as the starting point for a flexible employment biography.

Life in the old dog yet – the concept of the regulated occupation in German-speaking countries

The concept of the training occupation is constantly being called into question despite the fact that the labour market in Germany is organised along occupational lines and many members of the population continue to acquire their first vocational qualification within the dual training system. The training occupation lies at the core of the dual system. It contributes both to societal stability and integration and to company and macro-economic productivity. As well as aiming to deliver professional training, the training occupation in its present form also represents an important basic pedagogical principle and acts as a state system regulator. By way of contrast, the employment occupation is of considerable significance to both individuals and society in terms of securing a basic livelihood, societal participation, biographical continuity, personal autonomy, and meaning in life (cf. Kraus 2006).

It is important to draw a distinction between the employment occupation and the training occupation. Whereas the employment occupation merely refers to the design of the division of labour within the employment system itself, the training occupation constitutes an important interface between the educational system and the employment system. The training occupation is a structured educational programme that forms part of the (vocational) education training system. It is based on practically relevant work and business processes and, as defined in Section 1 of the Berufsbildungsgesetz (BBiG) [Vocational Training Act], imparts the skills, knowledge and capabilities necessary in order to exercise a qualified occupational activity in a changing world of work. Both the educational perspective and employment prospects need to be taken into account when assessing the usefulness of the concept.

History of the training occupation

Modern vocational education and training has its roots in the craft trade traditions of the Middle Ages. It has undergone a long process of development, during which critical debate on the concept of the regulated occupation has constantly brought about changes to the way in which an occupation is defined and in the degree of significance accorded to it. The starting point for the view of the regulated occupation we hold today has its basis in an attitude to work that is influenced by medieval thought and theology (cf. Conze 1972). During the second half of the 18th century, ideas of individual preference and societal utility (cf. Blankertz 1969) began to come to the fore to replace notions of divine vocation and assignment of social status. The beginnings of industrialisation in the 19th century altered the economy and ways of life, and the modern performance principle became established. These changes also brought about the institutionalisation of vocational education and training. As well as being responsible for the occupation, schools also took on the task of "reproduction of societal labour capacity" (Harney 1999). Since the 1920s, the form and weighting of work experience and teaching and opportunities for co-determination in terms

of shaping vocational education and training have formed main objects of educational policy debate. This culminated in the passing of the BBiG in 1969 (cf. Greinert 1998).

At the end of the 1970s, industrial sociological and pedagogical criticism of the concept of the regulated occupation (cf. Beck/Brater 1978; Beck/Brater/Daheim 1980), led to a "despecialisation" of training occupations. The accusation that large groups within the population were suffering disadvantage and that important competences for personal development, enhancement of social status and occupational and professional advancement were absent from vocational education and training resulted in a broader and more substantial design concept for occupations (cf. Laur-Ernst 2000).

Increasing Europeanisation reignited discussions regarding the viability of the concept of the regulated occupation. In the 1990s, the Anglo-Saxon concept of modularisation (cf. Reuling 1996) was controversially aired as a reaction to the companies' increasing need for flexibility. The aim was that modules would facilitate rapid adaptation of the competences of skilled workers. The reform policy adopted by the Federal Government in 1996/97 opted for a form of modularisation within the context of the concept of the regulated occupation (cf. Kloas 1997). Training occupations were structured in such a way so as to offer internal differentiation. From 2009 onwards, modular concepts based on training occupations were piloted in the transitional area and in second-chance training for adults.

This brief retrospective view illustrates that the repeated adaptations to the concept of the training occupation, some of which have been fundamental in nature, have taken place as a reaction to societal and technical changes. Current debate does not dispute the fact that adaptation is needed because of the shift in general economic and social conditions. There are, however, controversies in terms of the extent of adaptation needed, as to whether the notion of the occupation itself should be called into question or whether the emphasis should be much more firmly placed on modernisation of the concept (cf. Kraus 2006) and with regard to which guidelines should characterise the process.

The training occupation within the area of conflict of different functions and requirements

Challenges and the requirement for adaptation arise from the area of conflict created by the different functions the training occupation is expected to meet. Whether the occupation can fulfil the purposes of the individual, of society and of the economy and therefore also of vocational education and training itself is being called into question (cf. Baethge/Baethge-Kinsky 1998). Whereas some believe the concept of the regulated occupation to be too rigid by dint of the fact that it is no longer able to offer individuals useful guidance for their journey through life, (cf. Voß 1997), others stress the "lasting social cohesion" it provides (cf. Konietzka/Lempert 1998).

The debate surrounding employability is lending significance to a further personally related paradigm, which is primarily aligned to the needs of the labour market (cf. Kraus 2006, pp. 61 ff.). With the support of minimalist adaptation training, the demand for mobility and flexibility formulated within the context is subordinating vocational training entirely to the dictates of the market and to this extent may be viewed as a counter-concept to the regulated occupation which views comprehensive employability skills as the target dimension of vocational education and training processes.

It should be noted that alignment to both company requirements and to educational policy and societal needs has always enabled stakeholders to find sustainable and future-oriented solutions which have contributed to the success of the dual system and to the international recognition it enjoys. The concept of the regulated occupation has proved itself to be an effective instrument to support training at the intermediate skilled worker level and has helped to consolidate and expand Germany as a production location and the country's economic performance in the high-tech sector in particular.

The training occupation as the starting point for qualified skilled work

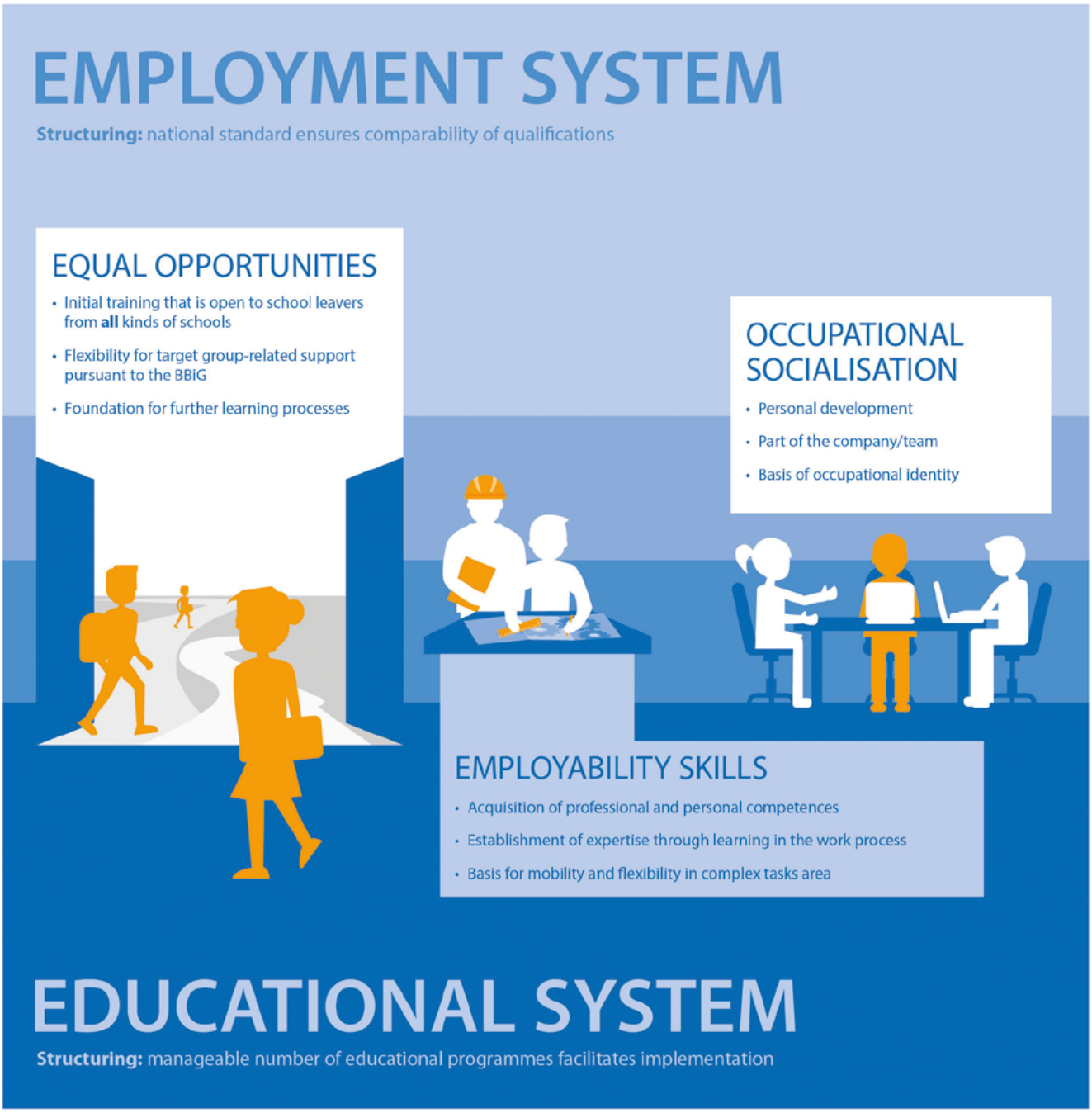
Although large numbers of people do not permanently work in the occupation in which they have trained, vocational education and training remains the prerequisite for employment in many related areas of activity. This means that vocational qualifications continue to exercise an important function in the world of work and act as a link between training and employment (cf. Dostal/Stooß/Troll 1998, for central functions cf. also Figure, p. 28).

For this reason, our plea below is for the training occupation to be structured in a sustainable way with the aim of undergoing expansion in respect of areas where there is potential for flexibilisation. Three aspects should be emphasised as being relevant to achieving success in this regard.

Acquisition of broadly-based employability skills

Company-based training is closely related to the work process, ensuring that it remains up to date and is aligned towards company needs and fields of deployment. This achieves an adequate level of employability, both with regard to the company providing training and beyond. The didactic processing of content at the vocational school supplements the expertise that trainees have acquired in

Figure
Functions of the training occupation at the interface between the educational and employment system



the company. This supports transferability and mobility, which in turn guarantee that persons with vocational qualifications can be deployed flexibly. The binding stipulation and examination of minimum standards also makes the qualifications transparent, and this facilitates both the recruitment of skilled workers and the planning of company-based continuing training. We may therefore state that dual training aligned to the concept of the regulated occupation imparts contents which to a large degree provide the necessary skills for mobility and flexibility in complex task areas. Within the process, consideration is accorded to specific company circumstances via structuring instruments in the form of specialisms, areas of deployment and elective and additional qualifications in order to facilitate flexibility within the concept of the regulated occupation. These forms of structuring offer different solutions for the necessary specialisations in company training contents. Duration of training is guided by the amount of time required to acquire broadly based employability skills within a domain.

Equal opportunities

In the debate surrounding the concept of the regulated occupation, consideration needs to be accorded to the fact that this is a form of initial training that should be open to school leavers from all kinds of schools. Flexibility is already built into the BBiG via possibilities to shorten the duration of training, the opportunity to complete training on a part-time basis and support provision for target groups with special needs. The ability to access training below the level of the higher education entrance qualification means that the training occupation remains an important instrument for securing equality of opportunity and societal participation. The ambitious objective of offering all target groups training provision which is relevant to the labour market and which is oriented towards broadly based employability skills should be retained in future. If the training occupation is also conceived as the foundation for further learning processes in working life, then the development of recognised advanced and continuing training concepts and the securing of permeability both within the VET system and to higher education are essential prerequisites.

Occupational socialisation

The experiences which trainees gain in their companies also leave their mark in terms of personal development. This means that, as a societal institution, the training occupation also supports the acquisition of social competence and autonomy skills in direct reference to company fields of deployment rather than being solely aligned to the imparting of professional contents. Companies which commit to dual training believe that this is a particular strength of this training pathway. Company processes continue to be organised along the lines of a division of labour and are still characterised by cultural influencing factors and by the specific need to achieve harmonisation at interfaces. The significance of this will not decrease in future. Investigations in innovative fields of activity (cf. Hackel/Blötz/Reymers 2015) show that the ability to work as part of a team, communication skills and work in interdisciplinary groups are all increasing in importance and are critical to success. These are further defining elements of the training occupation which need to be retained.

Vocational education and training once again under pressure? – Current challenges

The current debate may lead to the impression that the concept of the training occupation is in difficulties once more. Demographic and technological developments are important drivers in this regard:

- The fall in the number of school pupils has led to significant shifts in supply and demand on the training places market. A further factor is the changed behaviour displayed by pupils towards higher education. In some occupations and regions, this is already making it difficult for trainees to access occupationally-specific schooling that is near to their place of residence or work. Further flexibilisation of dual training would exert even more pressure on the vocational schools, the partner within the dual system.
- The increasing dynamism of societal and technical changes is cited as an argument for the decline in significance of learning an occupation. Digitalisation is creating new requirements for the training of employees and is necessitating new forms of training (cf. Zinke et al. 2017).

In the light of these challenges, there is a need for concepts and adaptations which develop the concept of the regulated occupation further and make it future proof instead of calling it into question.

Concepts for occupationally-specific schooling need to be drawn up, even in times of demographic change. It will be necessary to take account of the increasing heterogeneity of learners and of companies and regions. Possible solutions may include appropriate structuring of training occupations and the development of concepts for internally differentiated teaching. Well-trained vocational school teachers are a further basic prerequisite.

There is also a need for concepts for training in connection with the spread of digital technology. Account must be taken of the fact that tasks are increasingly taking place in digitalised systems, and these need to be mastered and understood. This makes it necessary for training to encompass the whole of the digital system from the very outset. Information technology is a fundamental part of this overall system and also represents an important learning aid and work tool. With regard to the imparting of training contents, consideration needs to be given at the same time to adaptations to move from a concept that tends to be inductive towards an approach which is much more deductive (cf. Zinke et al. 2017). This would also produce changes in the structuring of teaching/learning processes.

A further requirement placed on the training occupation is to lay the foundations for future learning processes. Autonomous discovery of topics within the scope of project work should be further reinforced, and greater emphasis in vocational schools should be placed on connectivity with other educational and training routes in advanced training as well as in higher education. In order to achieve this, greater consideration than before needs to be given to the imparting of domain-specific information competence for the purposes of research and tapping into knowledge and to

the appropriate use of specialist terminology (cf. Hackel/Blötz/Reymers 2015).

The present article shows that it is worthwhile to continue to work on the educational concept of the "training occupation". The advantage of the training occupation as a starting point for competent continuing learning during adulthood lies in the fact that it is a form of training which is based on transfer and expansion from the beginning. In order to retain connectivity in a changing world of work, dual training should concentrate even more strongly than before on learning in system correlations, problem-solving skills and connectivity. ◀

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Dual vocational education and training systems in Europe facing similar challenges

Approaches towards reform in Austria and Denmark

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The aim of the European Erasmus+ Project "Apprenticeship Toolbox" was to present dual training systems in Europe. Within the scope of the project, it became clear that these systems are facing similar challenges. This article presents the challenges and approaches towards reform developed in Austria and Denmark.

Background to the project

"A dual training system is characterised by a combination of company-based and school-based learning which is aligned to the needs of the labour market in a particular way and which leads to qualifications in nationally recognised training occupations" (Krekel/Walden 2016, p. 55).
The comparative representation of dual training systems within the scope of the Erasmus+ Project "Apprenticeship Toolbox" (cf. Information Box) made it clear that all five systems are successful in terms of performance, which is frequently measured against the low unemployment rate of those completing qualifications. Nevertheless, the systems continue to face a series of specific challenges if they are to remain competitive in future. The challenges and attendant modernisation strategies will be outlined below using Austria and Denmark as examples.

Apprenticeship toolbox

The aim of the project is to present the core characteristics of dual training systems, primarily in Denmark, Austria, Luxembourg, Switzerland and Germany, and to make this information available online.

The project pursued an exploratory approach, and this resulted in the selection of seven categories to act as a grid for the description of the dual training systems. The objectives of policy learning and policy sharing were operationalised within the framework of European workshops. All national working groups from the ministries and institutes responsible subsequently prepared the information for presentation in the Toolbox.

The project was conducted between 2014 and 2016 with the involvement of BIBB and under the lead management of the Danish Ministry of Education. It was co-funded by the European Commission.

For further information, please visit:
www.apprenticeship-toolbox.eu

Challenges for VET in the two countries

Although the vocational education and training (VET) systems in Austria and Denmark are successful, they are confronted with a series of challenges that are very similar to those faced in Germany. The particular challenges being experienced by the Austrian system of vocational education and training are as follows:

- Decline in the number of companies providing training and in the number of trainees, resulting in a shortage of skilled workers,
- a youth unemployment rate that is continuously displaying a slight rise,
- integration of young people from a migrant background,
- a high drop-out rate in dual training.

The particular challenges in the Danish VET system include the following:

- Access to higher education (permeability),
- equivalence of vocational education and training and higher education ("parity of esteem"),
- shortage of company-based training places,
- improved linking of VET with the needs of the labour market,
- the topic of inclusion.

Approaches towards reform

Reforms in Austria are taking place within the context of falling demographics and an increase in drop-out rates. Competition between initial education and training and (higher vocational) schools to secure the services of higher ability young people is proving to be fierce. Another aspect is greater concentration of training activities at larger companies (cf. Dornmayr/Nowak 2016). Against this background, the measures instigated to increase the supply of apprenticeships encompass the development of integra-

tive VET[1], financial incentives for companies to take part in training (funding for training contracts) and the funding of inter-company apprentice training programmes[2]. In 2015 and 2016, the Austrian Government introduced three new elements into the educational and vocational education and training system. Attendance at school or participation in training was made mandatory up until the age of 18. Quality management and systematic support and guidance for young people in training were put on a firmer footing within the Berufsausbildungsgesetz (BAG) [Austrian Vocational Training Act]. A number of programmes were introduced with the aim of achieving better transition to vocational education and training. These include the programme "Coaching and guidance for apprentices and companies providing training", measures to prepare young people for entry to VET (e. g. vocational orientation, second chance acquisition of the lower secondary school leaving certificate, management of the transition from school to work) and early stage support for young people at the interface between school and employment (information provision from the Austrian Labour Market Service, production schools, coaching for young people etc.) (cf. www.apprenticeship-toolbox.eu; BMWFW 2016).

In Denmark, reforms comprise improved vocational orientation and the development of hybrid training provision (so-called combination models of full-time school-based and company-based training) with the aim of increasing permeability within the educational system. The EUX Model combines vocational training with upper secondary education (general higher education entrance qualification). This was introduced in 2010 and has been in brisk demand, especially since the system reform in 2015. The Danish Government is seeking to counter the decline in company-based training places by launching new financing models. Companies providing training receive funding from the so-called Employer Reimbursement Fund for the period in which trainees are attending school. This fund is also used to finance activities to foster company willingness to provide training (cf. Kuczera 2017). Minimum marks for admission to training have been introduced in order to avoid drop-outs. A further innovation took place in 2013 with the introduction of training centres ("praktikcentre") with a view to compensating for the lack of companies providing training. These are very similar to the inter-company training centres which exist in Germany. Reforms are evaluated in formative terms via an analysis of the satisfaction levels of trainees and companies providing training. The relevant survey also includes the relationship between companies providing training and vocational schools (cf. www.apprenticeship-toolbox.eu; Hanf 2012; Jørgensen 2015).

Reform approaches in four main directions

The reform approaches merely outlined here allow four main directions to be identified:

1. Change in the relationship between the two learning venues (vocational school and company)
2. Measures to increase participation in training and improve the companies' ability to provide training
3. Change in the interlinking of dual training with general or academic education (permeability, lifelong learning)
4. Strengthening of quality assurance

Despite different emphases in the vocational education and training systems, the modernisation strategies exhibit similarities with German programmes such as JOBSTARTER, the inter-company training centres or vocational orientation measures. For this reason, ongoing networking on the effects and successes of the relevant reform measures appears useful in order to learn from and with one another on the basis of best practice examples. It would also be conceivable to expand this networking with regard to future challenges such as the integration of refugees or the new requirements arising in the wake of digitalisation. ◀

[1] The term "Integrative vocational education and training" has been in use since 2003 and designates VET provision for disadvantaged young people. Within the framework of the BAG reform of 2015, such training continues pursuant to Section 8 b BAG (extension of apprenticeship period or partial training) (cf. Dornmayr/Nowak 2016).

[2] Inter-company apprentice training encompasses training measures at training institutions under a training contract (the contract is concluded for the whole of the period of the apprenticeship). It also includes training programmes that take place within the scope of a cooperation agreement between training institutions and companies providing practical training under a training contract, which is shorter than the whole of the apprenticeship period (cf. Dornmayr/Nowak 2016).

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Financing of vocational education and training in Germany

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German vocational education and training attracts a good deal of attention globally because it offers young people a good way of entering the employment system. However, what are the associated costs? Although precise determination of costs is difficult in methodological terms, this article attempts to address the issue.

Overview of financing

Three parties contribute towards the financing of vocational education and training in Germany:

- the companies,
- the public sector and
- the trainees themselves.

The Figure (p. 34) gives an overview of the sources and uses of financing.

In the training year 2012/13, costs to *companies* of providing company-based training were around Euro 7.7 billion. These costs exclusively relate to the dual training system. In the budget year 2013, total spending by all *public bodies* (Federal Government, federal states, Bundesagentur für Arbeit (BA) [Federal Employment Agency]) was approximately Euro 9.7 billion. Public funding is used to finance the dual system, but also full-time vocational schools, the transitional system, and the structural development. No information is thus far available regarding the amount to which the *trainees* themselves participate in the financing of their training. Their contribution essentially comprises the loss of income they suffer as a result of their training compared to employment in an unskilled or semi-skilled capacity. Rough estimates made by BIBB indicate that the financing contribution made by the trainees is considerable and is consequently underestimated.

How are the amounts calculated?

Costs for companies are estimated via a BIBB survey conducted on a regular basis (cf. Jansen et al. 2015).[1] The most recent survey relates to the 2012/13 training year, and results were extrapolated using the trainee structure as of 31 December 2012. The Figure presents net costs, i.e. the gross costs incurred by companies minus the value of the productive contributions of the trainees.

Companies also participate in school-based vocational education and training via such activities as supervising trainees during obligatory practical phases. We do not know for this type of training whether company training costs outweigh the productive contributions or whether the opposite applies, as is, for example, presumably the case with the occupations of nursery school teacher and geriatric nurse. The *aggregated financing contributions made by trainees* in the dual system can also be approximately assessed on the basis of the BIBB survey mentioned before.[2] Assuming that trainees could, if they were full employees, earn the same wages as unskilled/semi-skilled workers in the observed companies, resultant losses of income are of a similar magnitude to the aggregated training costs of the companies. Those attending vocational school on a full-time basis are not included in the calculation. Their losses of income, at least at the level of the individual person, are likely to be significantly higher because no training allowance is paid.

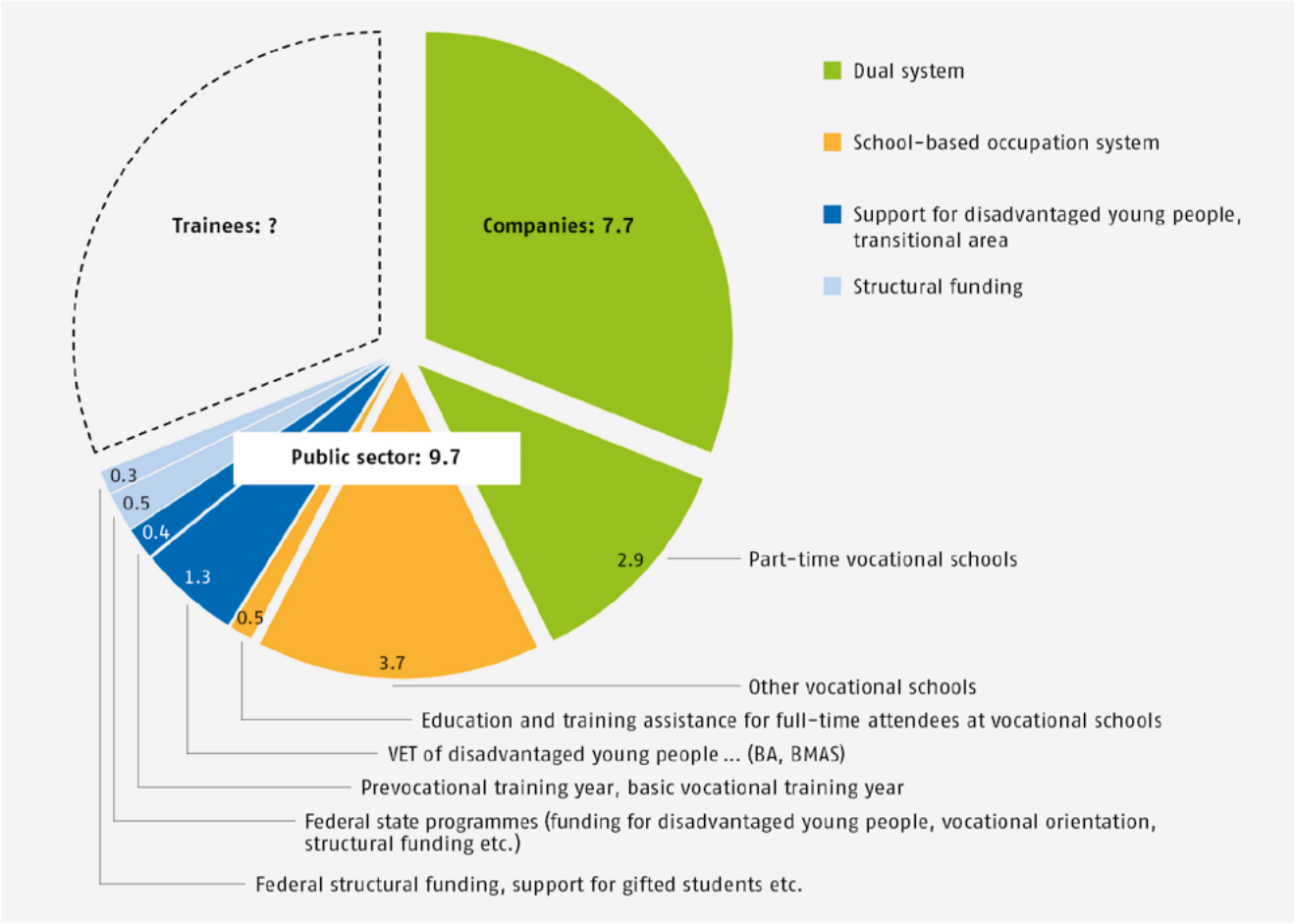
The assumptions regarding relevant comparative wages give rise to considerable uncertainty in estimating losses of income. Comparative wages and loss of income would

[1] Cf. also the explanations on extrapolation of costs (in German) at www.bibb.de/de/11060.php (retrieved: 07.09.2017).

[2] This rough calculation is based on data from the previous survey, which relates to the year 2007.

Figure

Financing of vocational education and training in Germany in 2012/2013 in Euro billion



be overestimated if, for example, unskilled/semi-skilled workers at the companies covered by the BIBB survey have more occupational experience than the trainees. On the other hand, trainees are likely to be in possession of better personal qualifications, something which can alleviate or even (over) compensate for this effect. For this reason, the Figure is restricted to a schematic representation of magnitude. Other costs to be borne by trainees, such as those for learning or work materials or the fees school-based trainees are occasionally required to pay, are probably negligibly small compared to losses of income.

The presented figures pertaining to *public spending* relate to the 2013 budget year (cf. Müller 2015). Public spending is focused on federal state-funded vocational schools. The official statistics, however, record spending only for vocational schools overall rather than separately for the individual types of school. Assuming that one lesson causes the same level of costs at all school types we allocate overall spending on vocational schools to the different school types based on the respective number of hours taught at each school type. The trade and technical schools, which primarily tend to form part of the continuing training system, are not included. The largest single share of spending is on part-time vocational schools in the dual system (around Euro 2.9 billion in 2013). Spending on individual types of school in the school-based occupation system, such as full-time vocational schools or specialised upper secondary schools, is lower although these schools together actually account for approximately Euro 3.7 billion. Transitional provision such as the prevocational training year and the basic vocational training year make up about Euro 0.4 billion.

In the school-based occupation system, the living costs of those attending vocational school on a full time basis are also funded pursuant to the Bundesausbildungsförderungsgesetz (BAföG; approximately Euro 0.5 billion) [Federal Education and Training Assistance Act] alongside the financing of vocational schools. In the transitional sector, VET spending by the BA and the Bundesministerium für Arbeit und Soziales (BMAS) [Federal Ministry of Labour and Social Affairs] together totals around Euro 1.3 billion and constitutes a further major segment.[3] These costs re-

[3] The "transitional area" encompasses all measures which provide preparation for entry to training and do not lead to a full vocational qualification.

late to vocational orientation and preparation as well as to vocational education and training itself. A large part of BA funding is used to support trainees who are particularly disadvantaged, specifically trainees in publicly financed company-based training. The latter could also be said to be part of the dual system because it represents a substitute for company-based training and thus supplements the dual system. The same applies with regard to the vocational education and training assistance which trainees within the dual system receive in order to secure their living costs (approximately Euro 0.4 billion). Spending on the vocational education and training of disabled persons is not included in the Figure.

The federal states continue to offer countless funding programmes which display a relation to vocational education and training. A rough estimate by BIBB put the value of these at around Euro 0.5 billion in 2013, whereby a causal correlation with the VET system not necessarily need to exist. Several programmes are in place to support infrastructures (such as inter-company vocational training centres, training for disadvantaged young people or vocational orientation). Other schemes are aligned towards economic policy and provide assistance to areas such as the small and medium sized enterprises (SME) sector. It is, however, unknown to what extent the funds are connected with initial or rather with continuing vocational education. The same applies to Federal Government spending on structural development, maintenance of infrastructures or support for gifted students, which also in some cases is connected with continuing vocational training.

Is the spending worthwhile?

Our remarks describe a complex financing system for vocational education and training in Germany. The question arises as to whether this expenditure is worthwhile. For all parties providing financing, however, such spending represents an investment which may in some cases only pay off at a significantly later point in time. Companies may, for example, save recruitment costs by taking on trainees at the end of their training. Trainees presumably expect a lower risk of unemployment or a higher income in future, and public authorities anticipate positive effects on social systems and on society as a whole. ◀

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Costs and benefits of company-based training in Vietnam

Chances and limitations of applying the BIBB cost-benefit model

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Many countries aim to involve more companies in the vocational education and training system. Transparency of the actual costs and benefits of company-based training activities helps governmental authorities to steer this process adequately and can be used to convince firms to increase their involvement in company-based training. This article illustrates the challenges of implementing a cost and benefit study in Vietnam. It discusses the application of the BIBB cost-benefit model, the implementation of the survey, and the interpretation of the main results under special consideration of the different contextual conditions.

Background

In contrast to the German Dual System, which has a long tradition of high participation by firms, the TVET system in Vietnam is mainly organized in a school-based way. Company involvement in TVET is relatively low and consists mainly of the implementation of internship programs within the scope of school-based initial vocational education. Consideration also needs to be given to the fact that these internship programs are neither standardized with respect to content nor with respect to duration. The Vietnamese Government has recognized this as a problem and initiated a comprehensive reform of the vocational education system. One focus in this reform process is on improving the cooperation between vocational training institutes and firms as well as on extending and improving the company-based training phases. Moreover, in the course of the current reform process, the aim is to improve the monitoring and reporting system of the vocational education sector.

Since 2010, BIBB, the National Institute of Vocational Training in Vietnam (NIVT), and the Gesellschaft für Internationale Zusammenarbeit und Entwicklung (GIZ) [German Agency for International Cooperation and Development] have been working together on the development of vocational training reports for Vietnam (cf. Erckelens et al. 2014 and Erckelens et al. 2015). Within the framework of this trilateral cooperation, the plan was to complement the report for the reference year 2013/14 with a focal theme on firms' costs and benefits of internship programs. Due to the long standing experience in the conception and implementation of quantitative cost-benefit surveys (cf. Schönfeld et al. 2010), BIBB was requested to provide technical advice and support for the cost-benefit study in Vietnam.

Thus, the cost-benefit study in Vietnam had two goals. On the one hand, the objective of the study was to supplement the latest vocational training report by providing initial assessments of the cost-benefit relation of internship programs. A second goal was to use these insights to convince firms to start or intensify their training activities and cooperation with vocational schools.

Adaption of the cost-benefit model

The starting point for the calculation of the costs and benefits was the BIBB cost-benefit model. This is based on a differentiated concept, which was developed in 1974 by the so called Edding-Commission (cf. Sachverständigenkommission Kosten und Finanzierung der beruflichen Bildung [Council of Experts for costs and financing VET] 1974). Since 1980, BIBB has refined this model and conducted five representative surveys.

The gross costs of this model are made up of four different components. These are "costs of apprentices", "costs of trainers", "physical costs", and "other costs". The last mentioned also include administrative costs and the costs of recruiting apprentices. The benefits mainly comprise the pro-

ductive contribution made by the apprentices. On the basis of this model, cost and benefit analyses were conducted in Albania and Georgia (cf. Ahnfeld et al. 2011)[1] as well as in South Vietnam in the year 2012 (cf. Aipperspach/Specht/Ahnfeld 2012).[2]

The questionnaire for this cost-benefit analysis in Vietnam was developed on the basis of these previous experiences and a preceding pre-test. While the broad cost categories of the cost-benefit model could be transferred, the fine adjustment of the cost-benefit positions as well as their operationalization had to be adjusted according to the specific contextual conditions in Vietnam. In the following, we present some examples of the contextualization of the cost-benefit model and corresponding similarities and differences. It should be noted that, in the Vietnamese context of internship programs, the cost categories refer to interns.

Training allowances: The cost positions in the category of personnel costs for interns were assessed in the same way as the costs of apprentices in the BIBB cost-benefit model.

Costs of trainers: Even though this cost category is also relevant in Vietnam because interns are supervised by personnel who need to be paid, the elicitation of personnel costs for trainers was relatively challenging. None of the companies surveyed explicitly employs training personnel. The interns were guided and supervised by foremen involved in production or by trained personnel "who looked after them from time to time". Therefore, it was very important to identify the exact proportions of time during which the employees of the firms were involved in the supervision of the interns. The opportunity to ask further control questions and to visit the production sites helped immensely in terms of estimating these proportions realistically.

Physical costs: Due to the low degree of standardization of the training organization, interviewees might have subsumed different cost items under the category of physical costs. In order to ensure comparability, the interviewees were asked to specify the exact cost item and their respective costs. The costs of this category were only counted when they could be clearly attributed to the companies' training activities and not to the production process.

Other costs: Here it was important to allow for further cost categories that are relevant in the specific context of Vietnam. Beside transportation costs, costs of meals and accommodation are essential cost positions in Vietnam. Often the interns come from rural areas in the countryside and move for their internship to urban centres, where the majority of the industrial firms are located.

Benefits: In a similar way to the BIBB cost-benefit model, the benefits through productive work of interns were calculated by multiplying the hours of productive work with their performance level and the hourly wage of a worker with similar tasks. In contrast to the BIBB cost-benefit model, in Vietnam the recruitment costs saved were also included in the calculation.

Implementation of the survey

A representative survey requires drawing a random sample from a complete list of items to be observed. In Vietnam, no reliable and complete statistical data source on the current status of companies providing internships is available since the labour market is informally organized to a high degree. Moreover, representative studies are relatively cost intensive. As a result, the NIVT decided to conduct a case study of 14 exemplary enterprises that provide internship programs. Each case study comprises one interview with the person responsible for training and/or human resources within the firm. It consists of a standardized section on the costs and benefits of the internships and of open questions. In addition to this, the researchers visited the production site to obtain an impression of the firms and the internship conditions.

Whereas in Germany an independent survey institute is usually commissioned with the implementation of the survey, in Vietnam the researchers themselves conducted the interviews personally. The presence of the researchers allowed instant clarification of any questions arising and an explanation of the terms and concepts used. This was necessary since, due to the low degree of standardization and regulation of internships in Vietnam, the interviewees' understanding of terms and concepts involving training was very heterogeneous. In addition, the building of trust through the face-to-face interview was decisive for the willingness of the interviewee to provide information and ultimately for the success of the interview. All the interviews were conducted by one researcher from NIVT specialized in the Vietnamese training system and one international consultant specialized in empirical surveys. In addition, the interviews were accompanied by a translator.

This joint implementation of the interviews served both as a measure for quality assurance and as a measure for the development of capacities, which are essential to establish a new research field within the NIVT.

Main findings of the study

The results provide important indications for the desired cooperation between vocational schools and firms in Vietnam. Therefore, the most important findings are presented here (for additional information cf. Viet et al. 2015).

Figure 1 (p. 38) presents the average cost within the different components that firms incur per month and intern. For

[1] The study was conducted by PLANCO and financed by the GIZ.

[2] The study was conducted by PLANCO and financed by the KfW Entwicklungsbank.

Figure 1
Costs of internship per month and intern

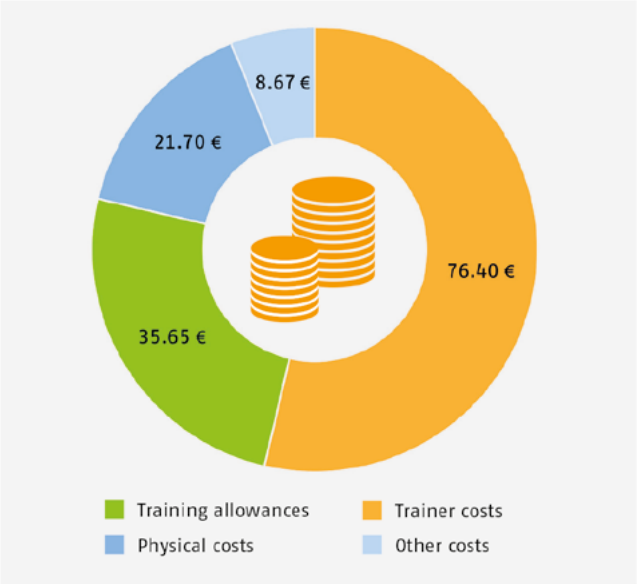
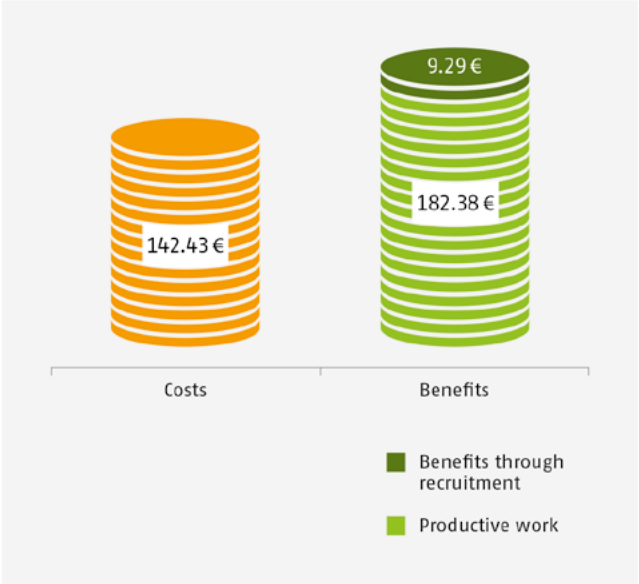


Figure 2
Average costs and benefits per intern and month



better comprehensibility, the values were transformed into euro.[3] We present the average values per month since the training duration varies substantially, ranging from one to six months.

On average, the 14 firms spend 142 euro per month and intern. Training allowances amount to 76 euro per month and intern and constitute the major share of costs. This is 25 per cent of the average skilled worker wage of 300 euro in the respective firms. Costs of training personnel are about 36 euro. Infrastructure and teaching materials are 22 euro and other costs eight euro. These values are average values. There is, however, a high variance between the firms. While the firm with the lowest cost pays 32 euro per month and trainee, the firm with the highest cost pays 338 euro.

Contrasting the total costs against the benefit, we can see that the total benefits are 191 euro (182 euro via the productive contribution of interns and nine euro via recruitment costs saved). This figure is much higher than the total costs (cf. Figure 2). Even excluding the benefits which arise through the retention of the interns, evidence of a positive cost-benefit balance is shown.

However, the survey did not only contain quantifiable benefits. Firms indicated that an enhanced reputation was the most important non-quantifiable type of benefit (cf. Viet/Nguyen/Huyen 2015, p. 21).

In addition to this, the open questions on the firms' training motives reveal further insights. Even though some firms mentioned that they provide internships in order to recruit skilled workers, most firms said in the qualitative interviews that they offer internships in order to make use of cheap labour. These statements shed a different light on the relatively high benefits created via the interns' productive work. While small firms use the interns mainly to cover seasonal or project related labour shortages, large firms belonging to this group tend to use interns as cheap labour constantly. The visits to the production sites showed that interns are often completely integrated into the production for simple tasks and work under bad conditions in some cases.

Potentials and limits of the adaption

The trilateral cooperation on the conception, implementation, and interpretation of the results led to the gathering of experiences from which valuable insights can be derived, both for the foreign partner institute as well as for the external advisors involved. If a research institute has no experiences in the field of cost-benefit analysis, it seems reasonable firstly to choose a simple survey design, e. g. in the form of case studies. In this way, it was possible to ensure the feasibility of the study despite limited time and financial resources and limited data availability. Moreover, the explorative part of the interview provided new insights, which can be used to derive further research hypotheses. As the suitability of the questionnaire for a standardized quantitative survey was also tested, these first experiences represent an important foundation for possible subsequent representative surveys. Representative surveys are recommended when complete and reliable lists of training firms

[3] For the conversion, we used the exchange rate from the 1 January 2015: 26,303.5 Vietnamese Dong = 1 euro. Source is OANDA: http://www.oanda.com/lang/de/currency/converter/ (retrieved: 07.09.2017)

already exist, methodological knowledge on sample selection has been acquired, and sufficient research questions on firms' training involvement have been developed.
Employing an already existing model for the cost-benefit analysis proved to be a good starting point for the structuring of the investigation, especially for the conceptualization of the questionnaire. It was shown that the four main cost components as well as the conceptualization of the benefits are also relevant to internship programs in Vietnam and can be used for their analysis. Thus, the rough structure of the cost-benefit model can be also applied in countries with less developed training systems. The exact specifications of the questions, however, need to be adapted to the contextual conditions of the respective country. Therefore, even though the concept of costs and benefits are also relevant in Vietnam, a simple transfer of the survey instrument is not possible.

The different contextual conditions should also be considered when interpreting the results. The result that the firms interviewed gain a benefit when offering internships can convince other firms to intensify their training activities. Nonetheless, qualitative elements of the interviews and the visits to the production sites pointed towards a relative low quality of the internship programs. Interpreting the result, account needs to be taken of the fact that virtually no regulations on content, duration, and organization of the internship programs, which can guarantee the quality of firms' training activities, exist in Vietnam. In Germany, where apprenticeships are highly standardized, it is useful to focus on the firms' costs and benefit ratio. In countries with less regulated vocational education systems, it is advisable also to consider the quality of firm's training activities in order to be able to make an appropriate interpretation of the research results. ◀

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Dualised training programmes on the Philippines

How can they be consolidated by increasing cost and benefit transparency?

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Companies have been involved in dual training in the Philippines since 1994. However their participation rate is minimal and the dual system of vocational education and training is not the focus of government stakeholders. Greater transparency of costs and benefits relating to company training might contribute to initiating, and empirically justifying, education policy decision-making which is specifically targeted at consolidating this qualification pathway. The article introduces key finds from the cost-benefit analysis as well as survey results which are considered in terms of recommendations for the next steps in the conclusion.

Vocational education and training in the Philippines

The Philippine VET system is divided into an *institution-based* sector which is generally a full-time school based model, a *community-based* which is focused on fast labour market integration and job creation measures, and an *enterprise-based*.

The latter falls under the Dual Training System (DTS) which has been regulated by dual VET legislation (Dual Training System Act) of 1994. The DTS combines theoretical and practical learning in the school/training centre (40 %) and company (60 %) learning locations as part of a learning location partnership.

Training courses are accredited by the Technical Education and Skills Development Authority (TESDA) which is also responsible for supervision of the Philippine VET system. TESDA has been a partner institute of the BIBB since 2014.

Trainees receive remuneration from the companies providing training. This must be at least 75 % of the minimum wage (currently € 8.50 per day). The training agreement is concluded with the training centre. The training period in the DTS varies between three and 36 months depending on the intended qualification. The participation rate of vocational trainees is very low. In 2014, it was approximately four per cent (70,000) of all trainees in the VET system (a total of approx. two million). Over the last ten years, the number has remained at this low level even though the number of trainees in total has increased by approximately 18 per cent (cf. Mapa/Almeda/Albis 2016). TESDA and the Philippine Chamber of Commerce and Industry Human Resources Development Foundation (PCCI HRDF) have therefore initiated a cost-benefit study in collaboration with the "K to 12 Plus Project"[1], University of the Philippines School of Statistics and BIBB.

The study had two aims: On the one hand, it sets out, for the first time, to measure the costs and benefits of training for companies in the DTS. This is intended to make the attractiveness for companies transparent and to stimulate future investment.

Concept and implementation of the survey

The BIBB has been carrying out surveys on the costs and benefits of company-based training since the 1980s. The most recent 5th BIBB survey was conducted for the 2012/13 training year (cf. Schönfeld et al. 2016). There is major interest in this analysis model within international collaboration (cf. e.g. Jansen/Horn/Nguyen in this issue, pp. 36 ff., for case studies in Vietnam).

[1] The "K to 12 Plus Project" is a Federal Government initiative to support training reform in the Philippines. "K to 12" stands for the stage in education from kindergarten to completing year 12, "Plus" stands for the additional VET.

Implementation of the cost-benefit survey

The survey of companies' costs and benefits of the DTS in the Philippines was based on the concept and questionnaire of the BIBB surveys. This concept was adapted to the general conditions of the DTS together with experts from (construction and tourism sectors) and the BIBB. Adaptations had to be made in particular with regards to the training duration and the different benefit categories. In the revised model, the gross costs comprise the costs of trainees, trainers, and of material and rent. The benefits are divided into three categories:

- Short-term benefits comprising contributions to production and seasonal gains.[2]
- Long-term benefits (understood as the benefits through the retention of trainees) comprising saved personnel recruitment costs and productivity differences compared to externally recruited employees. The personnel recruitment costs are divided into recruitment costs and induction costs.
- Additional benefits comprising those aspects which cannot be evaluated in monetary terms (cf. Mapa/Almeda/Albis 2016).

Sample

The study was focused on the four regions with the most companies implementing DTS. In the field phase (from September 2015 to March 2016), trained interviewers/enumerators contacted a total of 481 companies of which 448 provided training within the DTS. A total of 201 interviews were conducted with companies. In small and medium-sized enterprises, it was generally the owners who were interviewed and in larger companies it was the personnel managers, directors or owners. Most companies are based in the manufacturing (40 %), wholesale and retail (in particular repair of motor vehicles; 15 %), the hospitality sector (11 %) and in the construction sector (8 %). A total of 26 micro businesses (13 %; 1 to 9 employees), 77 small businesses (38 %; 10 to 99), 29 medium-sized businesses (14 %; 100 to 199) and 69 large businesses (35 %; over 200) participated in the survey. 44 % of companies offered DTS programmes of up to three months, 37 % offered programmes for between three to twelve months and 30 % for more than twelve months. In addition to the companies, 21 of the 82 schools/training centres (Technical Vocational Institutes – TVIs) were surveyed. Besides information on the DTS programmes provided, these surveys focussed on issues relating to expenditure and the TVI budget. Moreover, the survey has a rider instrument for the DTS trainees assigned in the companies. The 112 respondents were satisfied with the DTS programme and its relevance to the job market.

Key findings of the study

In the following, selected findings from the company survey are presented. One main focus here is the presentation of costs and benefits (cf. Mapa/Almeda/Albis 2016).

Costs, benefits and central influencing factors

The study shows average gross costs to be approximately € 243[3] per trainee per month across all companies surveyed. The costs are € 160 for trainees, € 45 for trainers and € 73 for material and rent.[4] At an average of € 104, the short-term benefits cover approximately 43 % of the gross costs. For the main part, these short-term are beneficial to the productive contributions of trainees (€ 97). The companies surveyed take on approximately one third of their trainees following the training. A majority of those who leave the company find a position in another company within the sector or abroad. When taking on a trainee, the company is able to make direct savings in terms of personnel recruitment costs. These add up to an average of approximately € 313, comprising € 253 for the recruitment process and € 60 for the induction costs. Productivity differences of € 39 per month between those completing DTS training and personnel recruited externally must also be added, at least at the start of employment (cf. Table, p. 42).

The Figure (p. 43) shows how the gross costs and short-term benefits differ according to the size of company, economic sector and duration of training.

Compared to the existing findings for Germany, an unfamiliar picture emerges for gross costs according to size of company. Micro businesses have the highest costs at € 409, while the large businesses with more than 200 employees show costs at just less than half the costs per trainee and per month at € 190. Besides having the highest gross costs, micro businesses also have the lowest short-term benefits from training (€ 85). However, differences by business size tend to be lower in this case. The differences between the economic sectors are also more pronounced for gross costs than for short-term benefits. At € 550, by far the highest cost by some distance occurs in the construction trades. Costs for companies in the engine repair sector are

[2] Benefits arise e. g. from savings made on costs of seasonal workers.

[3] An exchange rate of 100 PHP = € 1.9 is assumed.

[4] In each case "trimmed" averages are presented, i.e. the upper and lower 5 per cent of the distribution is excluded from the calculation. This controls for outlier values. In most cases, in this calculation, the sum of the subcategory averages calculated does not produce the "trimmed" average of total gross costs.

Table

Gross costs, short-term and long-term benefits per trainee (in €)

Gross costs per month	Average	Standard error
Cost of trainees	106	6
Cost of trainers	45	7
Physical costs	73	13
Total gross cost	**243**	**17**

Short-term benefit per month	Average	Standard error
Production contributions	97	4
Seasonal gains	7	1
Total short-term benefits	**104**	**4**

Long-term benefits	Average	Standard error
Personnel recruitment cost saved per process		
Advertising costs	19	6
Personnel cost of application process	218	37
Cost of external service provider	16	3
Total for personnel recruitment	**253**	**46**
Induction costs saved per employee		
Material costs	0.3	1
Personnel costs	60	13
Total long-term benefits	**313**	
Productivity differences per worker per month	39	3

Source: Mapa/Almeda/Albis (2016)

also above average at € 330. In both the processing industries and the hotel sector, gross costs are just under € 200. Short-term benefits range between € 84 in the engine maintenance area and € 116 in the construction industry. The highest gross costs (€ 368) and lowest short-term benefits (€ 98) are measured in the shortest forms of training (up to 3 months).[5] For training terms of up to a year, average costs are € 186 and short-term benefits € 109. For longer training terms, costs are € 214 and benefits € 110 per trainee per month. It is evident overall that companies are prepared to make substantial investment in DTS trainees. The two case studies (cf. Information Box) show how these investments benefit the company in different ways.
In addition to the benefits shown so far, training in the DTS, can also improve for example the image of the company among customers, suppliers and personnel and in so doing generate and benefit. The vast majority of businesses (above 80 %) confirm this positive effect.

Satisfaction from the perspective of stakeholders involved

The majority of companies appear satisfied (65 %) or even very satisfied (26 %) with their participation in training in the DTS. Despite comparatively high levels of investment in some cases, for them the system appears to represent a worthwhile model for the development of skilled workers. The additional survey at schools and training centres (cf. Mapa/Almeda/Albis 2016, p. 74 f.) shows that regular communication between TESDA and the TVI is crucially important. Various TVIs expressed difficulties in registering for DTS programmes due to complicated procedures and lack of access to companies and their requirements.
78 per cent of trainees surveyed (cf. ibid. p. 75 ff.) share the view that the DTS programme improved their skill levels, and strengthened their sense of responsibility.
81 per cent stated they had improved their professional skills and competencies as part of the training and 61 per cent said they were satisfied with the training content and process. Almost all trainees are very satisfied with the training personnel and the companies providing training. However, three month programmes are regarded as too short to meet all requirements and to do justice to the skills and competencies which must be delivered. This is confirmed by a range of companies who believe the first three months are needed to deliver basic knowledge and who favour longer programmes of at least six to nine months.

Case studies

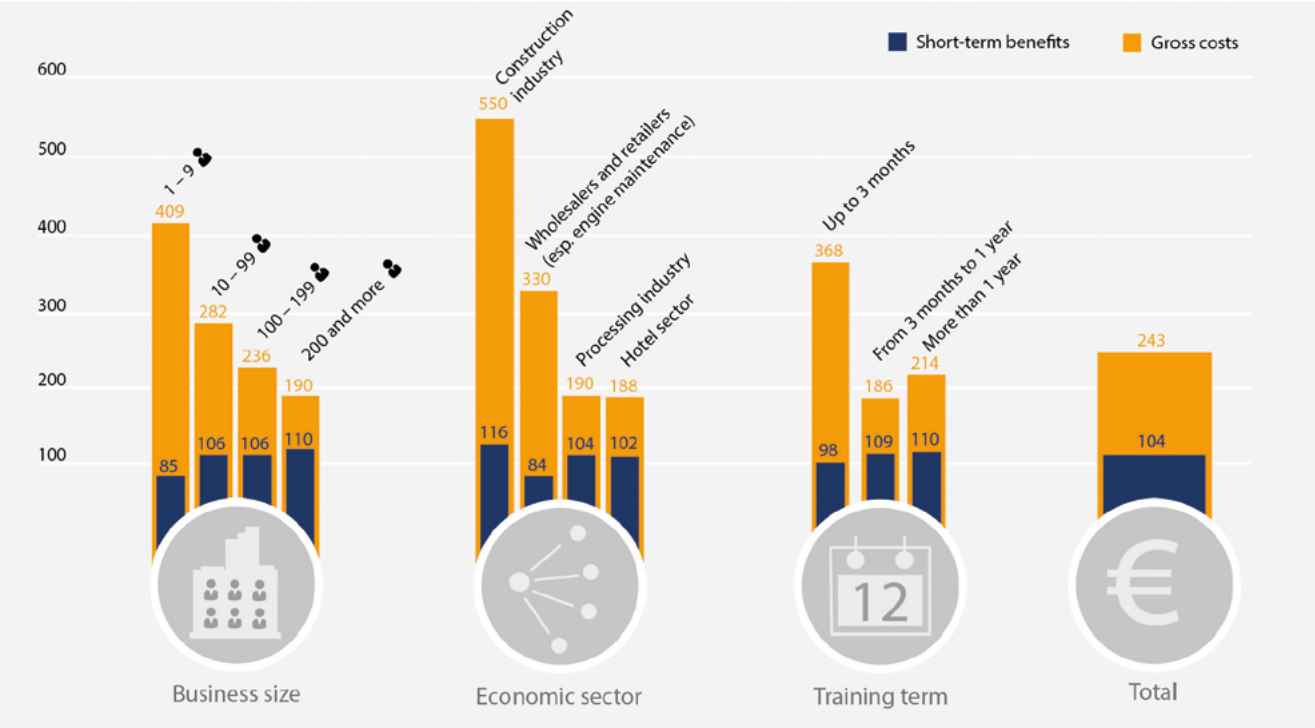
Training lasting three months in the hotel industry incurs total gross costs of € 564. By contrast, the total short-term benefit is € 306. If a company takes on a trainee, it can make recruitment cost savings of € 369. Assuming that, up to three months following training, the DTS graduate provides productivity advantages compared to those not trained in the DTS (€ 106), this results in an average overall benefit of € 217.

For training lasting 18 months in the construction industry, gross costs of € 3,420 and short-term benefits of € 1,872 are incurred. A further € 328 can also be saved if a trainee is retained. The former trainees are approximately € 41 per month more productive than externally recruited employees. This difference would have to persist for more than two and a half years in order to offset the costs. Further benefit aspects were generated in particular for the construction industry in the planning of the survey. For example, the DTS training may result in less wastage and less accidents thereby saving costs. However the surveying of precise cost savings proved to be complicated.

[5] The majority of micro businesses are based in the northern Mindanao region. These frequently offer training in the area of repair of motor vehicles. One reason for the high costs among this group could be the high transport costs incurred due to the geographical situation which also impacts on the training costs.

Figure

Gross costs and short-term benefits per trainee and month (in €)



Source: Mapa/Almeda/Albis (2016)

Recommendations

The survey of firms' costs and benefits of the DTS has shown that it is possible for companies to train young people in this system in a way which covers costs. However, at the same time there are also companies who in some cases accept high costs. Consolidation of the DTS is desired by a range of parties not least due to the excellent graduate employment opportunities. If this is to be accomplished, the DTS must be made more attractive for companies. The company surveys and the additional surveys of the TVIs and trainees provide some starting points in this regard.

On the one hand, short training terms have high costs, and on the other, all groups involved point to the fact that the short duration is not sufficient for learning the necessary content of the vocational qualifications. In this respect, achieving consensus regarding a minimum training duration should be relatively straightforward.

It is currently costing some sectors, and in particular small businesses, to provide training. These businesses must be shown ways in which they can improve the cost-benefit ratio. Best practice examples and targeted seminars could be used to support this. However, forms of financial or personnel support which might be effective must be examined. In some regions, very high costs are incurred due to regional characteristics. The extent to which government financial support can be provided must be examined in order to give companies in these regions the opportunity to provide training in a cost-efficient manner. ◀

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Young people from a migrant background – chances on the training market

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The training market situation has significantly improved for young people over recent years. Has this led to better opportunities for young migrants to find a training place? The present article looks into this question via a consideration of the training place applicants registered with the Bundesagentur für Arbeit (BA) [Federal Employment Agency] for the period from 2004 to 2014.

Group of persons forming the object of investigation

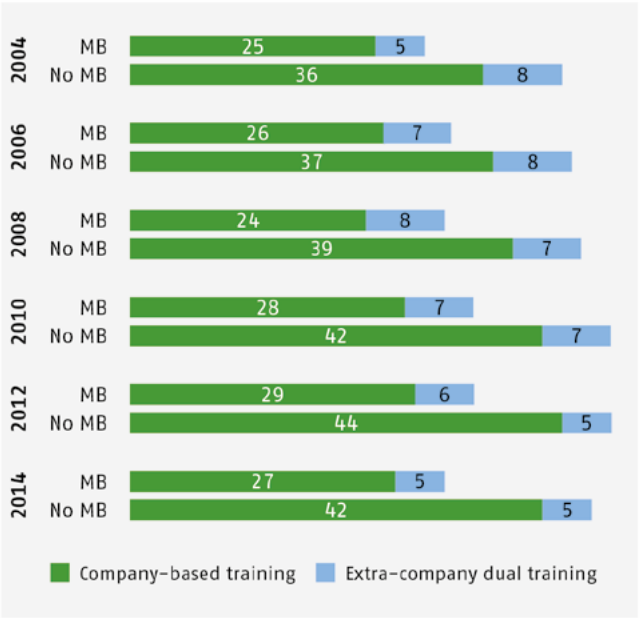
In the 2014 placement year, a good quarter of the training place applicants registered with the BA (just under 560,000 in total) were from a migrant background (cf. Beicht/Gei 2015). By definition, all persons who are registered as applicants are in possession of the necessary apprenticeship entry maturity. Applicants from a migrant background were either born abroad, hold foreign citizenship or else learned a language other than German as their mother tongue. Around two thirds were born in Germany, and about the same number also hold German nationality. Almost two thirds learned German as a (second) native language. The vast majority of young migrants has gone through the German school system, whereby they are more likely than applicants not from a migrant background to have achieved only the lower secondary school leaving certificate or no school leaving certificate.

On a two-year cycle, BIBB works in conjunction with the BA to carry out a survey of registered applicants in the placement year regarding their search for training and their destination. These representative BA/BIBB applicant surveys are conducted in written postal form at the end of the calendar year. Attention needs to be drawn to the fact that registration with the BA is voluntary. For this reason, young people who find a training place without being registered are *not* recorded as applicants. In 2014, this applied to just under one third of all young people interested in entering training.

Low level of training search success

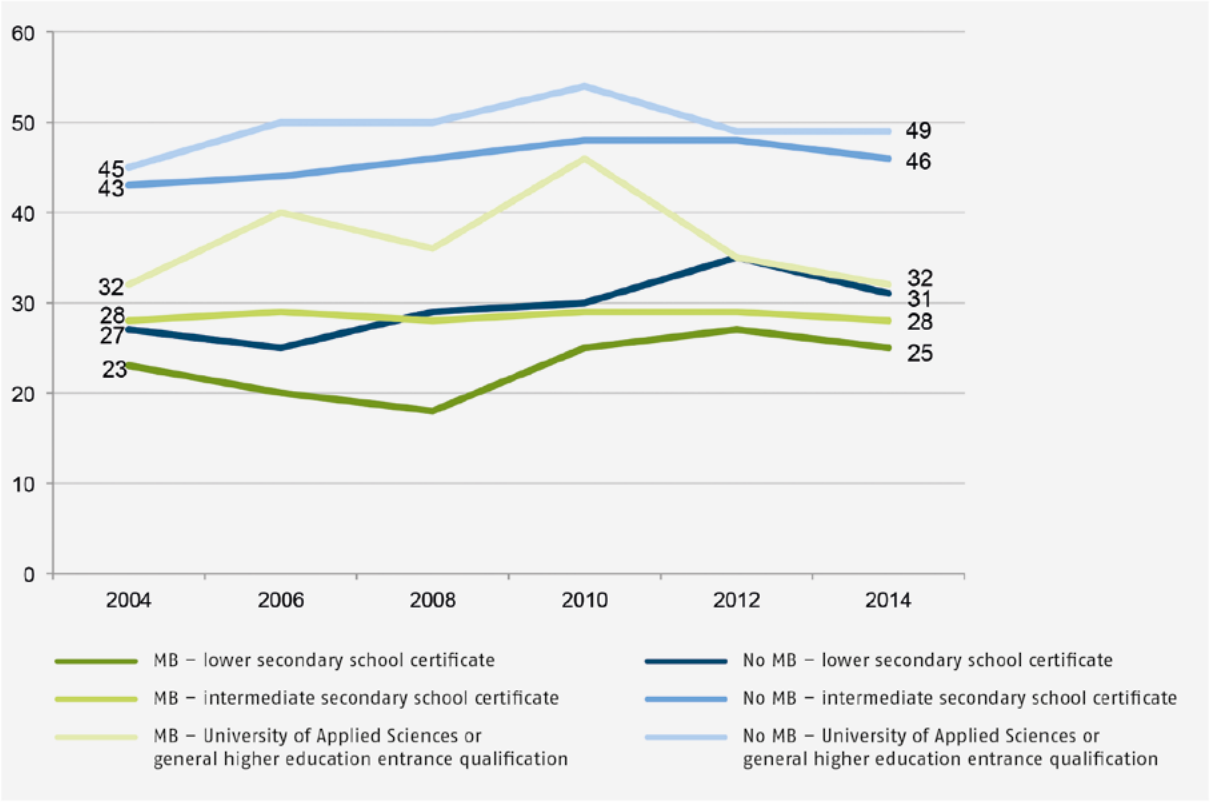
Although registered applicants from a migrant background frequently make even greater endeavours to obtain a training place than their counterparts not from a migrant background (cf. Beicht/Gei 2015), they are significantly less likely to be successful in their training search. In the 2014 placement year, for example, only 27 per cent of young migrants progressed to company-based training, whereas the corresponding figure for young people not from a migrant background was 42 per cent. Despite the improvement in the training market situation in overall terms, there has scarcely been any rise in the progression rate to company-based training for applicants from a migrant background over the past ten years (cf. Figure 1). By way of contrast, the progression rate for young people not from

Figure 1
Progression of applicants from and not from a migrant background (MB) to company-based and extra-company dual VET from 2004 to 2014



Source: BA/BIBB Applicant Surveys 2004 to 2014, own calculations

Figure 2
Progression of applicants from and not from a migrant background (MB) to company-based dual VET from 2004 to 2014 by school qualifications



Source: BA/BIBB Applicant Surveys 2004 to 2014, own calculations

a migrant background has increased markedly. This has reinforced the differences between the two groups of applicants.

Alongside company-based training, disadvantaged young people have access to a limited range of extra-company dual vocational education and training, which is predominantly publicly financed. This, however, makes very little impact in terms of compensating for the worse chances experienced by young migrants in company-based training.

A long way away from equality of opportunity

The school leaving qualification achieved is significant in determining success in the search for *company-based* training. The higher the qualification, the better the chances normally are. However, even if the *same* school qualification is obtained, applicants from a migrant background are less likely to be successful than those not from a migrant background. As Figure 2 shows, the progression rates between the two groups have always differed significantly in the case of a lower secondary school leaving certificate. The difference is four percentage points in 2004 and six percentage points in 2014. The variations are even greater in the case of an intermediate secondary school leaving certificate (a difference of 15 percentage points in 2004 which is rising as high as 18 percentage points in 2014). The chances of migrants in possession of the intermediate secondary school leaving certificate are now only marginally better than those from a migrant background who hold a lower secondary school leaving certificate, and compared to persons with a lower secondary school leaving certificate and not from a migrant background, the former group is even at a disadvantage.

Persons in possession of a higher education entrance qualification who are from a migrant background are also much less likely to progress to company-based training than those not from a migrant background. After relatively strong fluctuations over the last ten years, the progression rates (in both groups of applicants) are now scarcely higher than for those in possession of the intermediate secondary school leaving certificate. Increasing orientation to higher education probably plays a major role in this regard. Nevertheless, it is noticeable that, since 2012, the progression rate of persons in possession of a higher education entrance qualification who are from a migrant background has been virtually the same as that of persons who hold a lower secondary school leaving certificate and are not from a migrant background.

Alongside the school leaving qualification, there are also further factors which exert an influence on successful transition (cf. Eberhard 2012). Young people's social origin, their school qualification and the situation on the regional training market are of major significance within the process. Multivariate analyses, in which the various influencing factors are considered at the same time, nevertheless make it clear that the disadvantages experienced by young migrants at the transition to company-based training cannot be solely explained by these factors (cf. the summary provided in Beicht 2015). The differing career wishes of applicants from and not from a migrant background are also not decisive in this regard (cf. Beicht/Walden 2015). The conclusion of all this is that young migrants are significantly less likely than young people not from a migrant background to obtain a company-based training place even if the same conditions apply.

Conclusion – companies need to have fewer reservations

Many companies are now complaining of major difficulties in filling their training places. At the same time, young people from a migrant background who are considered to be in possession of apprenticeship entry maturity very frequently fail to find a training place. The supposition is that company selection procedures produce disadvantages for young migrants, and this is indeed something which existing studies indicate (cf. the summary provided in Beicht 2015). Companies do not seem to accord the *same* degree of recognition to the school certificates of young migrants as they do to those of young people not from a migrant background.

This is also a particular concern with regard to the many young people who have fled to Germany as refugees in recent times and whose integration can only succeed via well-founded vocational training. The training of such persons poses an especially large challenge. In order to improve training opportunities for *all* young people from a migrant background, it seems indispensable to raise the level of acceptance they receive in the companies providing training. ◀

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Refugees on their way into training – what support do they want?

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The integration of refugees in training is currently one of the key socio-political challenges facing Germany. But how successful has this been so far? In the 2016 migration study, which was conducted by the BIBB in cooperation with the Bundesagentur für Arbeit (BA) [Federal Employment Agency], around 1,600 vocational education and training (VET) applicants from a refugee background were surveyed about their current situation and on their views and opinions. The results highlight the problems perceived by refugees on their way into training and the areas in which they would like to have support.

Current situation of refugees

Of the applicants surveyed who fled to Germany from one of the non-European asylum access countries, around one third stated that, at the time of the survey, they were in vocational training leading to a full qualification or taking a degree (vocational training in the dual system: 30%, full-time school-based training: 2%, degree: 1%). Almost one quarter of respondents completed a partly-qualifying activity at the end of 2016/start of 2017 (introductory training: 8%, placement: 3%, other transitional activity such as pre-vocational training year: 12%). A further 16 per cent were on a German course or integration course and four per cent were attending general education schools. Around one in every five had not yet succeeded in entering the German education and training system: ten per cent of respondents stated at the time of the survey that they were working or doing casual work and a further eleven per cent were unemployed.

BA/BIBB-migration study 2016

In cooperation with the BA, BIBB conducted a written, postal survey of applicants from a migration or refugee background registered with the BA. The population comprised 65.445 young people and young adults without German citizenship who had been registered for training or continuing education in the reporting year 2015/16. By means of a disproportionate sampling approach, particular consideration was given to individuals who were nationals of the asylum access countries. Self-reporting of country of birth and of the asylum applications submitted made it possible to differentiate between people with and without experience of migration and with and without a refugee background. The following analyses only consider refugees from non-European asylum access countries (Afghanistan, Eritrea, Iraq, Iran, Nigeria, Pakistan, Somalia, Syria).

Detailed information about the study is available at: www.bibb.de/de/59586.php (retrieved: 07.09.2017)

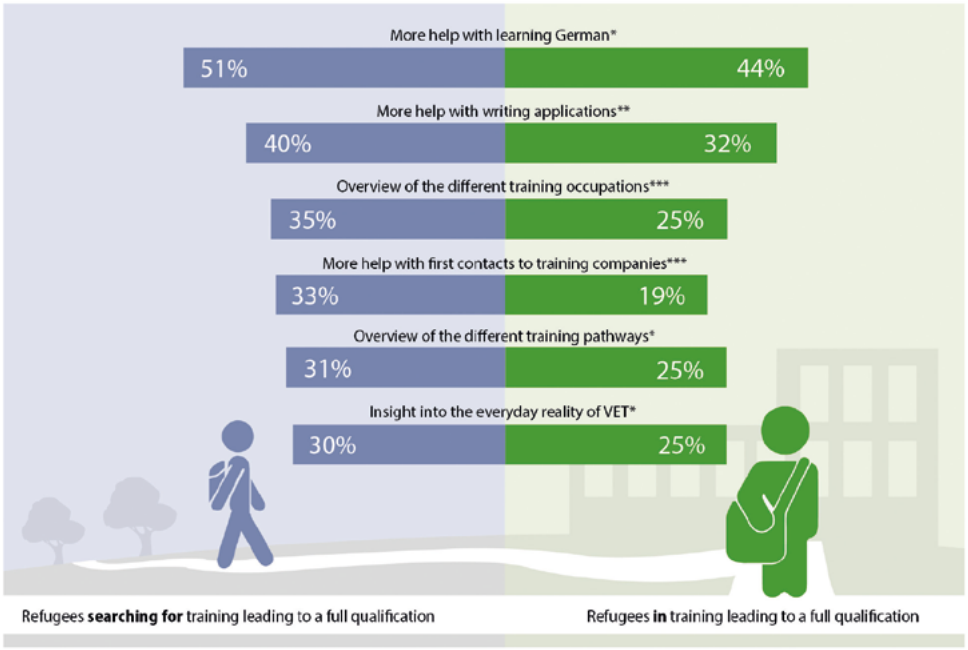
Refugee support needs

In which areas would the refugees surveyed have required greater support? What type of support are those refugees in particular, who are yet to make a successful transition into training, asking for? In order to address this question, respondents were shown a series of items which had proven to be relevant in preliminary discussions with careers advisers and refugees. Respondents were asked to tick all support requirements which applied to them and to openly specify any further aspects.

Virtually all respondents (91%), regardless of whether they had been successful in finding a training place or not, stated that they needed more help. According to their statements, the most urgent need for support was in learning the German language. Even though, being registered as applicants, they are officially deemed to have "training maturity" and therefore to have sufficient knowledge of German, almost 50 per cent expressed the need for more support in this area. Of those refugees who had successfully entered training leading to a full qualification or were taking degree, 44 per cent would still have liked this support.

Significant differences are evident in terms of access to information and making contact with companies between

Figure
Support requirements on the way into training



* significant ($p < 0.05$),
** highly significant ($p < 0.01$),
*** maximum significance ($p < 0.001$)

Source: 2016 BA/BIBB Migration Study (n = 1,436)

those who have successfully entered training leading to a full qualification or are taking a degree, and those who have not yet succeeded in making this transition. In each case, around one third of applicants who had not yet been successful stated that they needed a better overview of the various training pathways and training occupations, insight into the everyday reality of vocational education and training, and more help when making initial contact with training companies. 40 per cent of those who had not yet entered training leading to a full qualification or enrolled on a degree would like help with writing applications. The proportion of applicants who have successfully entered training or study and who saw this as relevant was significantly less but was still between 19 per cent and 32 per cent (cf. Figure).

Regardless of their success in searching for a training position, around one quarter of refugees would also have liked more school-based preparation and an overview of financial support. Revealing feedback was provided by around one third of respondents who stated they required more help from authorities or in dealing with authorities. The open responses provide more specific insights in this regard.

Greater support required with everyday organisation

Around a total of 140 individuals made use of the opportunity to openly specify additional support requirements. The information indicates that the search for a training position is not always the most pressing concern but that initially there is a much greater need for support with everyday organisation and integration in Germany. For example, a noticeably large amount express the desire for greater help with finding language courses, when searching for accommodation and childcare, when corresponding with authorities, and with the asylum procedure in general.

It therefore seems important that young refugees are supported early and in a way that is appropriate for the individual concerned, in order to ensure the conditions are in place which allow them to actively search for a training position. For individuals in particular who have not been in Germany for so long, help is required both for everyday practical matters (for example searching for accommodation) and in terms of helping them to understand and find their way in the German training system. Proven regulatory instruments are an important basis for vocational guidance and contacting companies, however they need to be adapted to the specific requirements of this target group. Ongoing language support is particularly important in this respect.

The analyses presented show that the commencement of training does not mean the integration process is complete. Even those refugees who have successfully made the transition into training continue to express the need for support. Proven instruments such as assisted training or training support measures should therefore be increasingly used because they facilitate individual support for young people and for companies. ◀

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Recognizing vocational qualifications of refugees – examples from "Prototyping Transfer"

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The Recognition Act which entered into force on 1 April 2012 aims to provide better employment opportunities in training occupations for people with foreign vocational qualifications. This option is also of interest for refugees, many of whom were unable to bring with them the relevant documents needed for the vocational qualification to be recognised, such as a diploma or employment reference. However, under certain circumstances, a recognition procedure may also be carried out without documents by means of skills analysis. The article examines this option which is enshrined in the Berufsqualifikationsfeststellungsgesetz (BQFG) [Professional Qualifications Assessment Act], and presents initial experiences of its implementation.

Recognition despite missing or incomplete documents

During 2014, Alaa Kheralah aged 33 and from Syria, applied for asylum in Germany. He had previously completed training as a dental technician in Jordan and following this he managed his own dental technician laboratory in Damascus. Civil war then forced him to leave his home country. He created a new life for himself in Ludwigshafen and wanted to work here in the occupation he had trained for as soon as possible. All the requirements needed to apply for recognition of vocational qualifications were therefore in place – completed vocational education and training and the intention to work professionally in Germany. Mr Kheralah had actually brought the certificates relating to his qualification with him to Germany. However, in order to compare the German and Jordanian dental technician training, the competent authority needed additional information about specific training content, but Mr Kheralah was unable to provide any written evidence of this.

He experienced what many refugees go through who are no longer able to provide the evidence required having had to escape from war-affected regions. Even if the certificates are available, the competent authorities often need additional information in order to be able to compare the content of education and training obtained in Germany and overseas.

It is often impossible to obtain this information if war is raging in the training countries or if the applicants have suffered political persecution. The BQFG provides options even in these cases: Applicants may provide evidence of vocational competencies which cannot be demonstrated via written evidence by means of "other appropriate procedures" (cf. Section 14 of the BQFG and Section 50 a (4) HwO [Crafts and Trades Regulation Code]) – for example, by means of specialist interview or work sampling (an identical paragraph has been adopted in each case in the Federal States' recognition laws). This procedure is described as "skills analysis" (Qualifikationsanalyse) in the following (cf. Oehme 2012). This allows an application for the recognition of foreign professional qualifications regardless of nationality and residence permit. This means that no specific recognition regulations are necessary for refugees or asylum seekers, but instead that the regulations already in place are sufficient.* The skills analysis is an assessment of competency and is not a test within the meaning of the BBiG [Vocational Training Act] and the HwO (cf. Kramer/Witt 2012). It is therefore based on other procedural standards than an external examination, for example.

* Healthcare occupations also have recognition regulations for missing documents. In these cases, level of knowledge equivalence must be demonstrated by means of an assessment test.

Table

Numbers and decisions in procedures for non-regulated professions* and regulated master craftsman occupations, decisions for which were made using the "other suitable procedures" option**

Year	Number of procedures	Decision before legal remedy				
		full equivalence (incl. limited access to profession under HwO)	partial equivalence	imposition of a compensation measure	negative	matter could not be resolved
2012	57	36	18	0	3	0
2013	66	30	24	0	12	0
2014	99	57	27	3	9	3

* In the case of the so-called "non-regulated professions", recognition of the vocational qualification is not required by law in order to be permitted to actually practice the profession: It is possible to seek employment on the job market immediately.

** For reasons of data protection, all data is rounded in each case to a multiple of three. Nine cases were withdrawn in 2012 due to implausible reporting.

Source: Statistisches Bundesamt [Federal Statistical Office]

Higher number of recognitions with skills analyses using Prototyping Transfer

As the number of immigrants increases, there has been a general rise in level of interest and demand for recognition of foreign professional qualifications and therefore also in recognition options available in the event of missing documents. Up to now the annual number of skills analyses completed and reported as part of official statistics has risen gradually (cf. Table). The reference occupations featuring most frequently in these procedures were "motor vehicle mechatronics technician", "electronics technician" and "joiner".

As the Table illustrates, the number of procedures completed so far is very small. A reason for the current reluctance is a lack of familiarity with skills analyses among competent authorities and counselling organisations. Some authorities are afraid of the perceived high level of work which a skills analysis requires as this involves the need to get hold of experts and for tools and performance requirements to be adapted to the individual case. However, competent authorities who have already gained experience identify a reduction in workload because, according to them, it is largely only the initial development which involves substantial work.

The three year project "Prototyping Transfer – recognition of professional and vocational qualifications via skills analyses" was launched in January 2015 with the aim of increasing the number of skills analyses. The project is financed by the Bundesministerium für Bildung und Forschung (BMBF) [Federal Ministry of Education and Research] and is based on the procedural standard developed in the previous "Prototyping" project (cf. Information Box). The project is being coordinated by BIBB.

Prototyping is being implemented by six project partners. These are the WHKT, IHK FOSA [Foreign Skills Approval, a public sector association of 77 Chambers of Industry and Commerce for the assessment of equivalence in professional qualifications], the Chamber of Craft Trades for Mannheim and Hamburg and the Chamber of Industry and Commerce for Cologne and Munich. They are working together to improve the awareness of qualification analyses, to inform other competent authorities and counselling organisations regarding options and to provide specific support with implementation. Materials and training for employees in the competent authorities is being provided for this purpose. Individual advice is also available. As the project proceeds, the intention is also to put together completed skills analyses and performance requirements, and where required to make these available to other competent authorities. This measure is intended to significantly reduce

Procedural standard for Prototyping

The previous Prototyping project (August 2011 to January 2014) was coordinated by the Westdeutscher Handwerkskammertag (WHKT) [West German Chamber of Crafts Council] and academic support was provided by the Forschungsinstitut für Berufsbildung im Handwerk (FBH) [Research Institute for Vocational Training in the Crafts Sector] at Cologne University. Free download of the prototype procedural standards and support: www.anerkennung-in-deutschland.de/html/en/skillsanalysis.php (retrieved: 07.09.2017).

the level of work required for subsequent skills analyses in the same occupations.

The costs of a skills analysis varies according to duration, and the tool and where applicable necessary workshops and/or material selected (cf. Böse/Schreiber/Lewalder 2014). In individual cases and once checks have been made, Prototyping Transfer offers to meet the costs of completing a skills analysis if it is shown that these will not be met by labour administration under the Social Security Code II/III. The special fund for financing skills analyses within the scope of the Prototyping Transfer project is administered by the WHKT. Chambers which are not a project partner in Prototyping Transfer may approach the WHKT directly if they have questions.

The competent authority for Alaa Kheralah's recognition procedure is the Mannheim Chamber of Craft Trades, project partner in Prototyping Transfer. They check the recognition application and offer to verify Mr Kheralah's occupational competencies for which no documentary proof is available, by means of skills analysis. He was invited to undertake trial work over five days in a dental technician laboratory observed by two experts. As part of the skills analysis, Mr Kheralah was required to work in a range of tasks and in the end his professional qualification was assessed as being fully equivalent. He started working in a dental laboratory a few months ago and he attends a German course in the afternoons. Financing of Mr Kheralah's skills analysis was made possible through the project's special fund.

Focus on refugees

The express intention of legislators was to use recognition of foreign professional qualifications to also increase the likelihood of success in the labour market for refugees. In the explanations to accompany the BMBF-Anerkennungsgesetz it states that:

"Section 18 a of the Residence Act, recently added by the Labour Migration Control Act of 2009, [makes it possible] for persons resident on a discretionary basis to receive a residence permit if they find employment appropriate to their qualification. The initiation of a recognition procedure for persons resident on a discretionary basis helps to enhance the effectiveness of this regulation, introduced in the interests of meeting the demand for skilled workers" (BMBF 2012).

Since the residence permit is not a requirement for a recognition application, no information is recorded as part of official statistics about this. Therefore, based on the current data available, it is not possible to state how often refugees make use of the options provided under the Recognition Act.

Within the scope of the Prototyping Transfer project, project partners have collected, where possible, information regarding residency status of applicants for skills analyses completed. A detailed look at the first twenty skills analyses completed shows that four individuals held a residence permit under Section 22–26 of the Residence Act (Residence for reasons of international law, for humanitarian or political reasons). No information was available for three of the individuals, and the other thirteen had another residence permit or had German nationality at the time of the skills analysis.

These skills analyses still included statements regarding the nature of the missing documents. In virtually all cases it was not possible to submit relevant information regarding content and the general framework of the training for the purpose of determining equivalence. In addition, in four cases, documents about the professional qualification itself were missing and in three cases no meaningful evidence regarding professional experience was available.

Most project partners are currently reporting that enquires are being received increasingly by people from Afghanistan, Syria, Iran or Eritrea. It may be supposed – even without the residency permit information – that the reasons for leaving the countries of origin relate to the asylum process. All project partners assume that, in future, a continued increasing interest in skills analyses is to be expected, in particular from recent immigrants. It is therefore important to actively create access for refugees and to clarify the options under law for the recognition of a foreign professional qualification and the requirements which must be met for this. This strategy is already being followed by competent authorities, for example, in refugee organisations or on ESF-BAMF language courses.

Pragmatic solutions where knowledge of the German language is inadequate

Everyone agrees that language skills are a basic requirement for integration. Ongoing expansion of the provision of integration and occupation-related language courses is therefore fundamentally important.

The training regulations for the training occupations in the dual system contain no specific requirements for language skills which means language level testing cannot also form a component of the equivalence check. A reoccurring topic of discussion is the fact that "company-based communication" is noted as a skill to be delivered in most training regulations. This includes, for example, being able to "conduct discussions in a manner appropriate for the situation" or "explain issues" (BGBl. I 2013, p. 1594). These formulations imply requirements in terms of German language skills, but these are not explicitly set out.

On the other hand, in the area of dual education and training occupations in general, no evidence of language skills is required from individuals who can submit their docu-

mentation in full. Ultimately, companies decide on the extent of German language skills employees need when they start, and what is required of them, in the course of the recruitment process.

If German language skills are not yet sufficient, pragmatic solutions must be found if refugees without documentation are to benefit from the opportunity provided by skills analyses. This is in line with the objective of ensuring the integration of new immigrants both professionally and into society occurs as quickly as possible. Such measures do not exclude the systematic acquisition of (additional) German language skills in parallel to the recognition procedure.

The project partners in the Prototyping Transfer project have agreed that, as far as possible, the skills analysis should be conducted in the German language. However, additional aids may be used where required, e.g dictionaries. Translators may also be called in to help explain the tasks. In the first twenty skills analyses completed, a dictionary was used in two cases and in one instance, a translator was used. It also makes sense to prepare a bilingual glossary containing relevant specialist terms in occupations which are in demand. On the one hand, this would support the learning of important specialist terms and, on the other, translators would not be required. This task is being worked on as part of the project and the necessary preparation work is already under way.

Implementation challenges

It is important, across all occupations, to have a uniform application of the procedures at a national level in the event of missing documents. The objective of the Prototyping Transfer project is therefore to inform competent authorities so that they understand and apply the range of possible procedures in the event of missing documents. The challenge is to develop a shared pool of expertise and knowledge of completed skills analyses, ideally involving all chambers, in order to benefit from previous experiences. This reduces the work involved in implementation and leads to uniform procedures.

Up to now, only very few skills analyses have been completed among the Chambers of Industry and Commerce. The IHK FOSA actually completed the equivalence check for virtually all Chambers of Industry and Commerce, however the respective regional Chamber is responsible for implementation of the skills analysis. The regional Chambers of Industry and Commerce are presumably therefore more reluctant when advising on the skills analysis as it is ultimately the IHK FOSA which decides whether or not to conduct the analysis. It is important therefore to continue to intensify the dialogue between the local Chambers of Industry and Commerce and the IHK FOSA and to create transparency in terms of the decision-making criteria.

Both uniform and, in particular sustainable organisational and funding options must be found for the skills analyses, particularly with regard to the language skills required, in order that individuals currently seeking asylum in Germany can benefit from the regulations.

This should be a shared objective among stakeholders both in terms of securing a skilled workforce on the one hand, and on the other in terms of the rapid integration of refugees professionally and in society. ◀

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Using simple language to manage the recognition process

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German officialese is difficult enough for many native speakers to understand. How much harder must it be for migrants who are confronted with this kind of language within the process of seeking professional or occupational recognition? This article describes both how the "Recognition in Germany" information portal uses simple language for the purposes of providing guidance and identifying occupational competencies, as well as the challenges associated with this approach.

What is simple language?

Many people will be familiar with the concept of "plain language", not least because of the reference made to the term by the United Nations Convention on the Rights of Persons with Disabilities. For government websites, plain language is even a mandatory prerequisite (cf. Barrierefreie Informationstechnik-Verordnung – BITV 2.0 [Federal Ordinance on Barrier-Free Information Technology]) and follows fixed guidelines. In contrast to plain language, simple language is still a relatively new construct and is used in a wide variety of ways without any clearly defined guidelines. A definition thus far has only existed to the extent of delineating it from plain language: "Simple language is more complex [than plain language]. More difficult terms are also used." (Kellermann 2014, p. 7). In the absence of any distinction between plain and simple language, mixed forms of the two have been created, and this further complicates the precise use of simple language. A summary of the main differences is provided in the Table.

Information provision for the recognition procedure

Because knowledge of German is not a prerequisite of recognition procedures, information relating to the Recognition Act and to the recognition of foreign qualifications needs to be presented in a way that is accessible and comprehensible for non-native speakers. Irrespective of

Table
Plain or simple language? The most important differences

Plain language	Simple language
Target group: Persons who can hardly read, such as illiterates and those with an intellectual disability	Target group: Persons with low reading skills such as functional illiterates, persons with a low level of education or reading and spelling difficulties, persons without a school leaving certificate or persons whose native language is not German
Guidelines are in place, legally established by the United Nations Convention on the Rights of Persons with Disabilities and the Accessible Information Technology Ordinance (BITV 2.0).	No guidelines yet in place and not established in law
Very simple words, no foreign words	For the target group of migrants: Explicitly use foreign words
Very short sentences (subject + predicate + object), only one message per sentence	Short sentences with no more than about 15 words and a maximum of one comma
Corresponds to Reading Level A1	Corresponds to Reading Level A2/B1
Aimed at about 5 per cent of people in Germany	95 per cent of the population are able to read texts in simple language

Sources: Klar & Deutlich – Agentur für Einfache Sprache, www.klarunddeutlich.de (retrieved: 02.09.2016); Kellermann 2014

this, the idea that as many people as possible should be able to autonomously obtain information forms part of the avowed policy aim to achieve inclusion.

The Federal Government information portal for the recognition of foreign professional and vocational qualifications www.anerkennung-in-deutschland.de has been dealing with this topic since its launch in 2012. The aim of making the portal available in nine languages is to make contact with persons who as of yet speak no or very little German. In addition to this, endeavours are also being made to provide information on the recognition procedure in a form of German which is readily understandable. Since the summer of 2016, the portal has consciously aligned itself to simple language and has also developed its own guide for use by the editorial team. Nevertheless, striking the right balance between easily comprehensible language and formulations which are legally watertight is always a tightrope walk for the editors.

Using respectful language when providing guidance

Simple language is also an important aspect of personal guidance on recognition. The benefit of a face-to-face meeting is that advisers can back up the simple language they use with gestures and also utilise signs and facial expressions to elucidate what they are saying to persons interested in seeking recognition.

Within the guidance context, respect plays a major role alongside comprehensibility. Rather than resorting to "child's speech", advisers should pursue a dialogue between equals in accordance with the unwritten rules of simple language:

- Do not use idioms
- Avoid convoluted subordinate clauses
- Steer clear of the subjunctive and passive
- Speak comprehensibly and slowly
- Be prepared to repeat complicated facts and circumstances (cf. basis & woge e.V. 2014)

Support is now available in the form of guides for advisers (cf. e. g. basis & woge e.V.), which provide an introduction to simple language and translate fixed terms such as "certificate of recognition" or complex processes.

Identification of professional and occupational competencies despite a low level of knowledge of German

Use of spoken simple language is also offered when professional or occupational competencies are assessed within the scope of a skills analysis.[1] The skills analysis was brought into being by the Recognition Act. It represents an opportunity to check professional knowledge using a process in which language plays a subordinate role, as is the case with the pure examination of documents by the competent body. Although the procedure should be conducted in German, the intention is that it will not fail because of language difficulties. Task assignments should be formulated in an appropriate way, and tools such as dictionaries, sketches and figures and the use of translators are all permitted. In addition to this, further support is provided by the empathy of the experts and by the assistance they provide, for example, in giving verbal or physical explanations of specialist terms.

Especially within a government authority context, simple language remains rarely used and still has many hurdles to overcome. Nevertheless, there are grounds for hope. Several initiatives aimed at simplifying official German are now in place across the country, and the Federal Government has already taken action. Since 2009, there have been editorial staff teams at the Bundesministerium der Justiz [Ministry of Justice] and in the Bundestag [German Lower House of Parliament] tasked with formulating laws in a more comprehensible way.[2] Work is under way on guidelines to regulate the use of easily understandable written German for non-native speakers in government authorities. Respectful verbal or written communication with persons interested in seeking recognition should be the objective of every government authority and of all those involved in providing guidance. Simple language is a step in the right direction in this regard. ◀

[1] Skills analyses are carried out in circumstances where persons are unable to provide appropriate documentary evidence of their foreign professional or vocational qualification because, for example, they have been forced to flee. In the skills analysis, occupational competencies are evaluated by experts via such means as a work sample, a specialist oral examination or a company-based work test.

[2] Cf. www.bundestag.de/dokumente/textarchiv/2010/28320471_kw02_gesetze_verstaendlich/200582 (retrieved: 07.09.2017)

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VET in times of economic crisis

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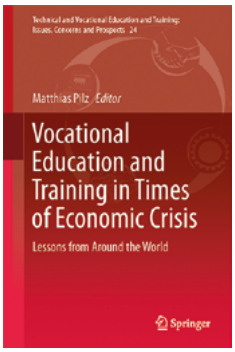

Vocational Education in Times of Economic Crisis
Lessons from Around the World
Matthias Pilz (Ed.)
Springer, Cham/Switzerland 2017, 514 p., ca. 150 EUR,
ISBN 978-3-319-47854-8 (also available as eBook)

Context and relevance of the publication

Better late than never – such publication has been long-awaited since the financial and economic crisis emerged nearly ten years ago. It contributes to close a gap in the international debate on the role of VET in a context of economic crisis and high youth unemployment. Such context is increasingly challenging education and training systems around the world to better detect and respond to demand, to become more 'agile' and flexible as well as to increase the quality of its provision.

At the same time, the crisis had a negative impact on VET itself. As the editor (Pilz) rightly states, many countries have reduced state funding for VET, companies have changed their roles towards less investment in skills and an 'academic drift' of young people can be observed in reaction to the crisis. The book does not claim to have "golden bullet" solutions but offers a variety of international perspectives and diversity of approaches that shed more light on the role that VET can play in economic crisis.

Structure and subject

The publication collects a series of articles around the topic of how VET has responded and adjusted in different countries in times of economic crisis. It opens up the theme to the reader through some examples of international comparative studies, ranging from broader topics, such as the role of NQFs and apprenticeship policies in transitions to employment, up to more narrow research on learning and upskilling required in the digitised creative sector or the induction of job entrants with midlevel qualifications in health care and car service sectors.

The main bulk of the book provides country case studies from Europe, the USA, China and other Asian countries. These sections are characterised by the wide range and huge variety of research topics covered, reflecting the different key issues at stake in the national VET research. From Centres of Excellence in India, transferable skills in Thailand, competence assessments for VET teachers in China, why some companies in the USA offer apprenticeships and others not up to addressing mismatch in Spain or the reproduction of social inequalities in German VET.

The book concludes with a section containing a few articles of more conceptual and theoretical nature, with an emphasis on policy borrowing and policy transfer of VET.

Key findings and highlights

The publication offers plenty of interesting but different key findings as a result of the diversity and "standalone" of articles in the book. Though quite some articles are not closely related to the main topic of the publication, namely VET in times of economic crisis, their findings remain relevant in relation to youth transitions challenges. Just to mention a few:

- the article on NQFs (Singh) concludes that a better understanding of NQFs could inform transition policies concerning youth, but cannot themselves promote alternative transition routes.
- Lassnig concludes that apprenticeships policies are not an "easy fix" for problems on the youth labour market and identifies that not the apprenticeship system itself but rather the strong tradition of labour market policies are the main reason for low youth unemployment in Austria;
- a study testing the professional competence assessment concept for VET teachers in China (Zhao, Zhang, Rauner) verified the usefulness of this tool and includes methodological findings on the need to improve the quality of some test tasks.

Reading between the lines a key finding and common denominator seems to be that VET can play a key role in transition from school to work if alternative pathways are provided and quality is ensured. However, VET cannot do much with regard to youth unemployment, unless it is combined with other, more powerful policies and measures.

Final conclusions and assessment

Overall, a valuable publication worthwhile to read and to consult. Though, readers who expect a more systematic and conceptual answer on how VET systems should adapt and respond in times of economic crisis, may be disappointed. However, the book is rich of information from latest VET research on the topic as well as in terms of variety of VET systems and geographical regions covered. And last but not least in terms of length. Almost 500 pages require some patience and long breath from the reader. But the book allows the reader "to pick and choose" articles of special interest. Particularly recommended can be some of the final chapters which are more theoretical and conceptual. This includes the VET system typology and "6 P Strategy" for Transfer analysis, introduced by Pilz, and the article of Unwin. The latter is questioning "if current VET researchers are sufficiently concerned with the life and contemporary workplaces". This may point to the 'evergreen' topic if and to which extent VET research is able to influence policy and practice. Unwin's suggestion to "recalibrate" VET research may be appropriate more than ever. The hope remains that these issues will be further discussed in the international VET research community and beyond. ◀

List of abbreviations

Abbreviation	German	English
ArbMigrStG	Arbeitsmigrationssteuerungsgesetz	Labour Migration Control Act
BA	Bundesagentur für Arbeit	Federal Employment Agency
BAföG	Bundesausbildungsförderungsgesetz	German Federal Training Assistance Act
BAG	Berufsausbildungsgesetz	Austrian Vocational Training Act
BAMF	Bundesamt für Migration und Flüchtlinge	Federal Office for Migration and Refugees
BAuA	Bundesanstalt für Arbeitsschutz und Arbeitsmedizin	Federal Institute for Occupational Safety and Health
BBiG	Berufsbildungsgesetz	Vocational Training Act
BIBB	Bundesinstitut für Berufsbildung	Federal Institute for Vocational Education and Training
BIBB-Qualifizierungspanel	BIBB-Betriebspanel zu Qualifizierung und Kompetenzentwicklung	BIBB Establishment Panel on Qualification and Competence Development (BIBB Training Panel)
BMAS	Bundesministerium für Arbeit und Soziales	Federal Ministry of Labour and Social Affairs
BMBF	Bundesministerium für Bildung und Forschung	Federal Ministry of Education and Research
BMWi	Bundesministerium für Wirtschaft und Energie	Federal Ministry for Economic Affairs and Energy
BQFG	Berufsqualifikationsfeststellungsgesetz	Professional Qualifications Assessment Act
CVET	Berufliche Fort- und Weiterbildung	Continuing vocational education and training
DQR	Deutscher Qualifikationsrahmen	German Qualifications Framework
EQF	Europäischer Qualifikationsrahmen	European Qualifications Framework
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit und Entwicklung	German Agency for International Cooperation and Development
HwO	Handwerksordnung	Crafts and Trades Regulation Code
IAB	Institut für Arbeitsmarkt und Berufsforschung	Institute for Employment Research
iABE	integrierte Ausbildungsberichterstattung	Integrated training reporting
IHK	Industrie- und Handelskammer	Chamber of Industry and Commerce
QuBe-Projekt	Qualifikation und Beruf in der Zukunft	QuBe project – qualifications and occupations in the future
VET		Vocational Education and Training
WHKT	Westdeutscher Handwerkskammertag	West German Chamber of Crafts Council

See also:

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