



European Employment Policy Observatory (EEPO)

Ad hoc request

Country fiches on skills governance in the Member States

Germany

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1 Imbalances in the labour market

General labour market trends

In May 2015, the lowest number of unemployment that occurred in this month since 1991 was recorded: 2.762 million persons were registered as unemployed.¹ The total unemployment rate reached 5.0% in 2014, the second lowest of the EU, and the employment rate was 73.8% (Eurostat data). However, discrepancies by skills level were large: For ISCED levels 0 to 2 (less than primary, primary and lower secondary education), the unemployment rate was 11.8% and the employment rate was 46.0%, for ISCED levels 3 and 4 (upper secondary and post-secondary non-tertiary education) it to 4.6% and 77.7% respectively, and for ISCED levels 5 to 8 (Tertiary education) to 2.5% and 87.7% respectively.

The share of long-term unemployment in total unemployment was 44.3 %. Particularly high long-term unemployment rates were reported for some of Eastern German *Länder*, which had undergone deep economic transformation in the 1990s. In contrast, the long-term unemployment rate was very low in the dynamic economic regions Bavaria, Baden-Württemberg and Rhineland-Palatinate.

In April 2015, the BA-X vacancy index reached 186 Points which is the highest value observed since the implementation of the index in 2004.² According to Eurostat data, the average job vacancy rate was 2.8% in the first quarter of 2015. Very high job vacancy rates were reported for the administrative and support service activities (10.1%) and professional, scientific and technical activities as well as administrative and support service activities (7.3%). According to the Institute for Employment Research (IAB)³, most vacancies are unfilled due to occupational, sectoral and regional mismatch, causing 10% up to 45% of unemployment depending on the definition of mismatch.

Mismatches in the vocational education and training system

The Federal Institute for Vocational Education and Training (BIBB)⁴ reports that mismatches between the number of apprenticeship places provided by companies and the number of potential apprentices have been increasing since the middle of the last decade. This is mostly due to regional mismatches: in some regions, companies are not able to fill their vocational training positions due to the lack of interested young people. Other regions lack in apprenticeship places in relation to demand. In 2013, according to the company panel (*Betriebspanel*)⁵ of the Institute for Employment Research (IAB) every fifth apprenticeship place could not be filled. According to the companies, this was due to the low skill level of applicants. One fourth of companies reacted to this by lowering their standards for interested applicants, e.g. by employing youths that would otherwise be not sufficiently qualified. During the past years, the number of lower secondary school graduates (*Hauptschulabschluss* and *Realschulabschluss*) has been decreasing and the number of persons with university entrance qualification increased. Lower secondary school graduates are usually recruited for dual vocational training. The lack of the supply of apprentices is a bigger problem in the new *Länder* than in the old *Länder*. In the same year, two out of three apprentices were hired by the apprenticing company, which is the highest rate since the beginning of reporting in 1996. This can be explained by the demographic change. In general, dual training activity of companies decreased. Baethge⁶ observes a widening gap of persons in training and the number of persons employed, most notably in the services sector. In 2012, about 267,000 young people representing 27% of the total number of persons entering vocational training, entered the so-called "transition system" (*Übergangssystem*) that was put in place to absorb school leavers

that could not find an apprenticeship place.⁷ Persons in the transition system take part in preparatory vocational measures and do not obtain a vocational qualification.⁸ The objective is to enhance their chances to enter VET. Nearly three quarters of young people who had no school-leaving certificate entered the transition system, 0.6% entered the vocational schools and roughly one fourth started training within the dual vocational training system. Among those with lower secondary school certificate (after 9 years of schooling, *Hauptschulabschluss*) 47% entered the transition system, 10% the vocational schools system and roughly 42% the dual vocational training system).⁹

The number of young people who enrol in tertiary education has increased substantially in the recent past, and some experts warn from a trend towards an "academisation" of the economy. At the same time the tertiary education system was reformed to align with the Bologna process. A bachelor and master level graduation were introduced. The master level replaces the former "diploma" level of universities. The Bachelor level is new, no equivalent existed before. Note, however, that former "diploma" degrees from Universities of Applied Sciences (which are traditionally more praxis oriented than universities) are recognised as Bachelors and not as Masters. It has been debated to what extent the new Bachelor system is substituting for some of the more complex dual vocational apprenticeships. A survey among 2,000 companies carried out by the Deutsche Industrie- und Handelskammer (German chamber of Industry and Commerce)¹⁰ showed that only 47% of companies were satisfied with the performance of bachelor graduates in 2015. The companies stated that bachelor courses should focus more on practical experiences of students in their field. A new interesting development is the spread of "dual study" schemes, which combines elements of the dual vocational training system (the long praxis phases and on-the-job training in companies) and university education.

Skills shortages

According to the Fortschrittsbericht Fachkräftebedarf 2014¹¹ (progress report skilled workers shortage) that was published by the Federal Government in February 2015, there is no skilled workers shortage in Germany at the moment. However, 19 shortage occupations (*Engpassberufe*) were identified in June 2014, particularly for healthcare, care and technical occupations. These shortage occupations include dual training as well as tertiary training occupations. According to a survey among companies carried out by the Deutsche Industrie- und Handelskammer (German Chamber of Industry and Commerce)¹², in light of digitalisation of the workplace, skilled workers are particularly needed in occupational fields like IT security, process know how and process organisation. According to labour market experts who participated in an expert hearing at the Parliament in April 2015¹³, 'digital skills' need to be promoted in German schools to a larger scale.

In the context of a forecasted ageing and decline of the labour force, skills shortage is regarded as one of the major future challenges of the labour market. Furthermore, in every German region a lack of jobs for low-qualified workers was reported by IAB.¹⁴ A low skills level of a too large part of the population is regarded as a major challenge: 14.5% of persons in working age are functional illiterate.¹⁵

Besides skill shortages in some occupations, in Eastern Germany, older workers are often over-qualified for the kind of work they do.¹⁶ However, in comparative terms the problem over over-qualification seems to be less pronounced than in other OECD countries.¹⁷ In 2012, 15.3% of persons employed were formally overqualified; this number was 11.2% for dual training graduates, 44.1% for persons with a bachelor degree and skilled craftsmen (Meister), and 40.7% for university graduates (except bachelor graduates).¹⁸ Occupational mobility is high for young age groups, but

decreases with age.¹⁹ Occupational mobility of young people can be explained as a matching process. But occupational mobility is also important for the needed flexibility of the labour market. Therefore, the forecasted rapid ageing of the workforce puts a threat on the German labour market, as it will be the older age groups which will have to assure that mobility is sufficiently high.

2 Production of labour market and skills intelligence

2.1 Forecasting capabilities

The German education and training system highly depends on co-operation between several stakeholders. Therefore, a wide range of actors is actively involved in the production of a great amount of (future) skills needs information

Forecasting instruments exist on national, regional, or local level. Furthermore, there are also multi-level and sectoral forecasts. Some of these projects are updated on a regular base, some are only carried out once. There are forecasting instruments that forecast either skills demand, skills supply, or both. There are short-term, medium-term and long-term forecasting instruments. In the following, some of these forecasting instruments are presented (for details, see Annex).

Currently, the two important long-term multi-level labour market forecasting instruments that simulate future skills demand and skills supply are the project QuBe - Qualifikation und Beruf in der Zukunft²⁰ (Qualifications and Occupations in the future) and the project Arbeitsmarkt 2030²¹ (The German labour market in the year 2030). Both projects are updated regularly. Within the project QuBe - Qualifikation und Beruf in der Zukunft, labour supply and labour demand is forecasted by qualification and occupation up to the year 2030. The project is carried out by the Institute for Employment Research (IAB) and the Federal Institute of Vocational Education (BiBB), with the collaboration of the Institute of Economic Structures Research (GWS) and the Fraunhofer Institute for applied Information Technology (FIT). First results were published in 2010. In the recent publication (2015), regional results were included. Results from these studies are fed into the process of steering vocational training (dual training) provision (see below).

Arbeitsmarkt 2030 (The German labour market in the year 2030) is a skills forecasting project by sector, qualification, occupation and company size for Germany and for the German *Länder*. Labour demand and labour supply is forecasted until 2030. The forecasting model reflects an integrated approach, linking supply and demand. It is carried out for the Federal Ministry of Labour and Social Affairs (BMAS) by Economix Research & Consulting, together with an international consortium²². In 2014, an update of the first forecast in 2012 was published. The reports include concrete recommendations for political actors regarding further training measures, immigration policy, or skilled workers shortages.

Deutschland Report²³ (Germany report) is a labour market forecast until 2040 carried out regularly by the privately owned Prognos AG that also deals with the labour market in the light of demographic change, apart from the forecast of general economic indicators.

These long-term forecasting instruments inform about possible long-term trends in the German labour market. Due to different methodologies and assumption they bring about different results and thus add to the discussion base for future development and policies. Industry and Trade Chambers and Confederation of German Employers' Associations representatives indicated that they are aware of these studies when formulating their standpoints.

Some of the national forecasts have been regionalised, using the same methodological framework. Some regional forecasts have been committed by *Länder* governments and use their own approaches, disconnected from the national forecasts. At the local level two approaches can be found: either they are derived from national forecasts (with the danger that local factors are not sufficiently taken into account) or they use their own methodology and are widely disconnected from other forecasts. Short-term regional and local forecasts are published by Prognos AG under the name *Zukunftsatlas Regionen*²⁴ (future atlas of the regions). Actors like municipalities or stakeholder associations can commission (sectoral or locally adapted) forecasts from Prognos that are based on above mentioned projects. There is also a range of regional and local forecasting projects that have been co-financed by ESF. Examples are the skilled workers study Berlin-Brandenburg²⁵ (*Gemeinsame Fachkräftestudie Berlin-Brandenburg*), the EQUIB-project²⁶ (qualification demands in Bremen) or the Regio Pro project²⁷ (qualification demand early warning system in Hesse). Regional forecasting is also carried out by the Institute for Employment Research (IAB).²⁸

From a methodological point of view, forecasting risks are increased at a lower territorial unit, due to the complexity of the forecasting, higher uncertainty regarding migration and relocation within the country, availability of detailed data, etc.. However, short- or medium-term forecasting instruments are helpful, especially when carried out regularly. Medium and Long-term forecasts can bring useful input to a long-term strategic approach and point to future challenges.

Sectoral forecasts are often commissioned by stakeholder associations. For example, the tertiary education report 2020²⁹ (*Hochschulbildungsreport*) is a forecast of tertiary education also concerning skills of tertiary education graduates and future demand for tertiary education graduates. It is carried out by the management consultancy McKinsey on behalf of the stakeholder Association for the Promotion of German Science and Humanities (Stifterverband für die Deutsche Wissenschaft). The research Institute IW Köln carries out occupation-specific skilled workers shortage monitoring and forecasting for employers' organisations (MINT Trendreport).³⁰ Skilled workers forecasting on a regional level is provided with the skilled workers monitor³¹ that is carried out on behalf of the German Industry and Trade Chambers.

Sectoral forecasts carried out on behalf of stakeholder associations might be biased to promote the enforcement of their stakeholders' interests, and are methodologically not very transparent in some cases. They however can be useful to put important items on the political agenda. For example, according to interviewees of the Confederation of German Employers' Associations (BDA), the setting-up of MINT-programmes (see below) were also boosted by their forecasting activities (MINT-Trendreport).

"Official" (skills) forecasts are carried out with regard to the education system. For example, the *Kultusministerkonferenz* (Standing Conference of the Ministers of Education and Cultural Affairs) is in charge of forecasting of first-year student numbers (until 2020).³² This data is also available on the regional level, e.g. for

Bavaria.³³ According to the Federal Government, this forecast provides planning security for the Federal State and the Länder.³⁴

In addition to the wide range of medium- and long-term forecasting instruments, short-term assessment tools are also very common in the German skills governance. The Federal Employment Agency relies on short-term assessment instruments to prevent surplus labour supply in the future that are often carried out by its research institution, the Institute for Employment Research (IAB). Examples are the short skill analysis based mainly on time needed to fill a vacancy ³⁵ (*Engpassanalyse*) or the *Fachkräfte radar*³⁶ (skilled workers radar). Also, surveys among persons employed are used to assess skills needs or skills demands on a short-term base, e.g. by the Federal Institute of Vocational Education (BIBB) in co-operation with the Federal Institute for Occupational Safety and Health (BAuA).³⁷ There are also short-term assessment instruments that are carried out on behalf of stakeholder associations, e.g. the associations of engineers and the employers oriented IW-research institute engineering monitor (*Ingenieurmonitor*).³⁸

The variety of skill forecasting and skill assessment instruments has the advantage that many viewpoints become part of the debate. On the other hand, the amount and assessment of information might overstrain political and economic actors.

2.2 Transmission and use of information

Transmission of information

In Germany, no mechanism is established that systematically regulates the transmission of skills intelligence information. However, there is a range of publications that collect and assess data concerning (future) skills needs and demands. One main publication is the *Berufsbildungsbericht*³⁹ (Report on vocational Education and Training) that is published regularly by the Federal Ministry of Education and Training and the *Bildungsbericht*⁴⁰ (Education Report) published by the Standing Conference of the Ministers of Education and Cultural Affairs and the Federal Ministry of Education and Training. These publications also take up information produced with forecasting instruments.

Also, formal mechanisms within the political system help to disseminate the information produced with the forecasting instruments. In particular, mayor and minor interpellations in the Bundestag or in the parliaments of the *Länder* often deal with information on skills demand and skills supply, e.g. regarding digitalisation of the labour market or skilled workers shortage. Federal Institutes who are also in charge of forecasting (e.g. BIBB, IAB) are also often actively involved in answering to interpellations. Other stakeholders can participate in expert hearings, e.g. at the Parliament.

Within the Main Board of the Federal Institute for Vocational Education and Training, issues concerning skills supply, skills demand and skills mismatches in the vocational training system are discussed. Information is drawn from all kinds of studies. The Main Board is also formally informed about findings of the government-funded research institutes Federal Institute for Vocational Training (BIBB) and Institute for Employment Research (IAB). On the occasion of a meeting, labour market intelligence had also been produced on a project basis, e.g. by the research institute Fraunhofer IAO. However, according to the Association of German Chambers of Commerce and Industry (DIHK), this approach was never implemented systematically.

The main mechanisms of transmission of the information produced are therefore advisory boards (e.g. in the Leibniz-institutes⁴¹), press and public relations work (e.g. getting in touch with stakeholder associations), and academic publications and presentations. The information produced is often published on the internet – and in many cases available for free.

Use of Information

According to representatives of the research institutes BIBB and IAB, sectoral stakeholder associations, employees' and employers' associations, other research institutes, as well as economic and political decision makers are also main users of information produced with forecasts. This was also confirmed in an interview with education and labour market experts of the Confederation of German Employers' Associations (BDA) and of the German Industry and Trade Federation (DIHK).

As already shown, forecasts are carried out on behalf of national and regional German ministries or governments as well as municipal bodies. These actors use the forecasts for their own strategic planning. The objective is to broaden the knowledge base for other actors. Private actors, private stakeholder associations (and more rarely large companies) also commission (mostly sectoral) forecasts. Therefore, market mechanisms (including public and private tendering and business planning by private actors) play an important role in the production and use of information.

According to the Confederation of German Employers' Associations (BDA), information provided by skills forecasts is used to formulate their positions. This is likewise the case also for other stakeholders.

In some cases, the institution that produces the information is also the main user. This is the true in the case of the Federal Employment Agency or the Kultusministerkonferenz (Standing Conference of the Ministers of Education and Cultural Affairs). Another example is the impact of results from the short skill analysis⁴² (*Engpassanalyse*) of the Federal Employment Agency on the positive list of immigration that determines immigration promotion into specific occupational groups.

In general terms, however, the impact of skills intelligence produced with forecasting instruments is often more long-term. It takes time for stakeholders to react to new insights.

According to the education and training expert Rudolf Tippelt (Professor at the Ludwig-Maximilians-Universität Munich), further training providers mostly adapt to the demand for further training courses, especially in urban areas. These institutions might therefore rely to a much lesser extent on skills forecasts. The further vocational training system is rather (short-term) demand driven.

Areas for improvement

All in all, it is up to the interested stakeholders to provide themselves with information on skills demand and skills supply. That means that the end user is mostly on his/her own in interpreting the information produced. This requires a sound knowledge about the German labour market and research methodology. This even more the case when interpreting information provided by interest groups, e.g. stakeholder associations, and for studies where the research methodology is not explained in detail. The different forecasting approaches and models could, therefore, been better connected and a platform for a discussion of different forecast results set up to allow easier interpretation.

According to an interviewee of the Association of German Chambers of Commerce and Industry (DIHK), one main problem in adapting to future skills needs is the lack in fundamental research regarding the impacts of digitalisation of the labour market. In this regard, it should be noted that the German skills governance system seems to have detected this lack of information. For example, the current runs of the two important long-term multi-level labour market forecasting instruments QuBe - Qualifikation und Beruf in der Zukunft (Qualifications and Occupations in the future) and Arbeitsmarkt 2030 (The German labour market in the year 2030) focus on this topic precisely and a number of studies in the areas have been recently commissioned by several ministries.

3 Steering the education and training provision

3.1 Policies and programmes

The skills governance in the area of school education is done by the *Länder* and municipal bodies and tertiary education is within the scope of responsibility of the *Länder*. Skill adaptation policies and programmes are therefore mostly aimed at promoting co-operation of public bodies, and universities on the national, regional and local level, for example within the framework of the *Kultusministerkonferenz* (Standing Conference of the Ministers of Education and Cultural Affairs). The *Kultusministerkonferenz* is a platform for inter-regional co-operation in primary and tertiary education.

The tertiary education pact 2020⁴³ (Hochschulpakt) established in December 2014 is an initiative of the Federal Ministry of Education and Science (BMBF) in cooperation with the *Länder* governments. In the light of skilled workers shortage and increasing tertiary training participation, the Federal Government and the *Länder* promote tertiary education with funds of EUR 20.3 billion (Federal Government) respectively EUR 18.3 billion (*Länder*) from 2007 until 2023. This measure can be seen as a reaction to increasing demand for workers that completed tertiary education. One focus point of the Hochschulpakt 2020 is the promotion of MINT (mathematics, engineering, natural science, technical occupations) university courses, e.g. by reducing the high share of university dropouts in this field.⁴⁴

There are also regional education programmes to bring together relevant stakeholders (including the social partners), e.g. the *Hessischer Bildungsgipfel* (Hessian education summit).⁴⁵

In the last years, companies became more involved in the steering of tertiary training provision, e.g. by offering dual tertiary training (Duales Studium) and by co-operating with universities.

Vocational training within the dual training system

The volume of apprenticeship basis depends on supply and demand. It is the decision of the company to offer apprenticeship places. There is an "apprenticeship culture" that is more or less well developed, depending on industries (and regions). In some sectors more people are trained than needed by the company (or sector) and vice versa (see chapter 1). In order to increase the supply of training places, the Alliance for training and further training (Allianz für Aus- und Weiterbildung⁴⁶) was implemented. Stakeholders involved are employers' organisations, employees'

organisations, *Länder* representatives, and the Federal Government. The main goal of the initiative is to match vocational training and further training demand and supply.

Several sectoral programmes are aimed at increasing the labour supply in occupations that are threatened by skilled workers shortage. This includes the promotion of so-called MINT-Occupations in programmes like *Komm mach Mint*⁴⁷. Here, for example, the participation of women in MINT-Occupations is promoted.

Another policy that brings together several stakeholders to develop measures regarding skilled workers shortage is the skilled workers campaign (*Fachkräfte-Offensive*).⁴⁸

Against the background of digitalisation of the labour market, the platform Industrie 4.0⁴⁹ was implemented to provide a platform for political decision makers on the national and regional level, company representatives, stakeholder associations, scientists, and trade unions, to discuss the effect of digitalisation. The national IT-summit (Nationaler IT-Gipfel), an information technology summit that takes place every year, has similar function.⁵⁰

To conclude, there are measures and policies that are focused on increasing cooperation between relevant stakeholders. However, there are also programmes and policies that are aimed at the promotion of specific courses or occupational groups, particularly for those occupations that are threatened by skilled workers shortage.

3.2 Financial incentives

One main measure that influences the funding of the tertiary education system is the programme excellence initiative⁵¹ (*Exzellenzinitiative*) that was implemented in 2005. Training of young academic talents is promoted to ensure international competitiveness in the university and research sector. Funding is provided for so-called graduate schools (*Graduiertenschulen*), that means universities that are strongly committed to training of academics. Universities apply for this by suggesting projects worthy of funding. In June 2012, projects at 45 *Graduiertenschulen* were selected for funding.

Financial incentives towards individuals are mostly aimed at increasing the participation or attractiveness of training in general, less commonly to boost specific subjects and courses.

A measure that boosts the attractiveness of training in general is the possibility for pupils, students and master craftsmen in training to apply for BAföG-funding (benefits according to the Federal Training Assistance Act). University students and pupils can apply for BAföG-funding up to EUR 670 per month.⁵² Pupils receive funding as a grant, university students receive half of the funding as a grant and half as an interest-free state loan. The level of BAföG funding depends on the income of the parents and/or husband or wife. Parent-independent BAföG-funding (Meister-BAföG) applies for persons in master craftsmen training (Meister)⁵³.

To promote tertiary training, the Germany scholarship⁵⁴ (*Deutschlandstipendium*) was implemented in 2011. Students are funded with EUR 300 per month provided that EUR 150 are funded by a private sponsor. The remaining EUR 150 are funded by the Federal Government. Students in MINT-courses are more likely to obtain a *Deutschlandstipendium*, as most companies⁵⁵ fund students enrolled in courses that

probably will be affected by skilled workers shortage. About 22,500 students had a Deutschlandstipendium in 2014, representing 0.84% of the total number of students in the winter semester 2014/2015.⁵⁶

Dual training grant⁵⁷ (*Berufsausbildungsbeihilfe*) is granted for apprentices in the dual training system that moves away from home to take up training. This measure therefore helps to increase the mobility of apprentices. Funding is granted for state-approved training occupations only. This might help to mitigate the placement mismatches in the apprenticeship places market.

With the further training scholarship⁵⁸ (*Weiterbildungsstipendium*), talented apprentices in the dual training system are able to apply for a scholarship. Since 2008, this is also possible for persons with professional training who are studying for their first university degree via the advancement scholarship⁵⁹ (*Aufstiegsstipendium*). These scholarships are funded by the Federal Ministry of Education and awarded by the chambers. In 2013, the funding volume was EUR 42.5 million.

Education and training expenses are also tax-deductible as long as they are in relation to the occupation held.

Several ESF-funded projects aim at steering the education and training offer. For example, in December 2014 an ESF-funded project aimed at improving the skills of long-term unemployed persons was announced.⁶⁰ Other national projects in this regard are, for example, *Jobstarter Plus* (a programme that supports SMEs that provide training) or *Bildung integriert* ("integrated education", a programme that supports municipalities to improve their local education offer).⁶¹

4 Career and vocational guidance

Guidance for pupils and persons who finished school is given by the Federal Employment Agency. It is furthermore given directly in schools and therefore a responsibility of the *Länder* Ministries responsible for education and of municipal bodies. Initial vocational guidance for persons interested in non-tertiary (dual) or tertiary training is a responsibility of the local industry and trade chambers (*Industrie- und Handelskammern*), the craft chambers (*Handwerkskammern*), tertiary education institutions like universities, and of the *Länder* Ministries responsible for education and municipal bodies (via career guidance in school). Adult education guidance is given by the Volkshochschulen (adult education centres providing evening classes), the above mentioned chambers, the Federal Employment Agency, and further training providers. Vocational guidance for persons returning to working life, for persons who want to follow a new career path, and for unemployed persons is provided by the Jobcentres of the Federal Employment Agency, by municipal bodies, and by the Volkshochschulen.⁶²

The main provider of career and vocational guidance is the Federal Employment Agency. Persons interested in guidance can make an appointment with a career advisor at the local Federal Employment Agency, furthermore career advisors visit schools to provide career and vocational guidance.⁶³ The Federal Employment Agency operates several local *Berufsinformationszentren*⁶⁴ (BiZ, occupation information centres) that provide personal career and vocational guidance concerning dual and tertiary training, career choices, retraining, and further training.⁶⁵ Many career and vocational guidance offers of the Federal Employment Agency are provided online. An

online career and further training guidance system of the Federal Employment Agency is the BEN – occupation development indicator⁶⁶ (Berufsentwicklungsindikator).

Career and vocational guidance provided by the Federal Employment Agency is based on short-term indicators rather than on long-term skills forecasts. This is due to the fear that vocational guidance based on long-term trends may lead to a “pig cycle”, that means to produces overcapacities in the long run.

As already mentioned, campaigns mostly focus on occupations threatened by skilled workers shortage, e.g. technical occupations or care occupations.

5 Stakeholders in steering education and training provisions

Steering of tertiary training provision

According to §9 German Higher Education Framework Act⁶⁷, the Federal State and the *Länder* decide jointly on fundamental and structural study course supply issues. In this process, academic, professional practice and tertiary education development should be taken into account. Furthermore, universities and professional practice experts should be involved in this process. In General, the *Länder* are responsible for the tertiary training system. For example in Baden-Württemberg⁶⁸, universities must ask permission from the regional Ministry of Science to establish, modify, or abolish a study course.

Study courses have to be accredited by agencies recognised by the accrediting council⁶⁹ (*Akkreditierungsrat*). The members of the accrediting council are appointed by the *Hochschulrektorenkonferenz* and the *Kultusministerkonferenz* and consists of tertiary training institute representatives, *Länder* representatives, professional practice experts (e.g. employers’ or employees’ representatives), international education experts, and students.⁷⁰ The accrediting council can be seen as a monitoring instrument of the tertiary training system.

As in the vocational training system, co-operation among the several stakeholders is crucial in the tertiary training system. The increasing involvement of economic stakeholders in the tertiary training system (see chapter 3.1) is ambiguous: on the one hand, this might promote job prospects of graduates. On the other hand, this might threaten the independence of research, science and teaching.

Steering vocational training (dual training) provision

The apprenticeship system has three major actors; the apprentices, the employers who train apprentices and the vocational schools. Their relationships are regulated by the Federal Law for Vocational Education and Training (*Berufsbildungsgesetz*) and the Crafts and Trades Regulation Code (*Handwerksordnung*). While the volume and structure of training places is not regulated (see above), the content of training is. The main consultative body of the Federal Law for Vocational Education and Training is the Main Board of the Federal Institute for Vocational Education and Training BIBB (see chapter 2.2). It consists of representatives from the Federal Government, employer associations, trade unions and the *Länder* governments. Each party has equal influence in advising on training regulations. The Board gives advice to the Federal Government and comments on all training regulations (*Ausbildungsordnung*), which are valid in all German *Länder* and thus create nationwide standards for apprenticeship training.

The implementation of practical training contents in companies is controlled by the responsible chambers. They monitor apprenticeship training, give advice to companies and apprentices, verify training personnel (those with a Meister or an equivalent university degree) and approve apprenticeship examinations. Attempts to assign this task to a government body were unsuccessful due to resistance from employers' associations.⁷¹ The responsible chambers also form vocational training commissions (*Berufsbildungsausschuss*), which are organised both locally and nationally. They consist of six representatives of employers, employees (trade unions) and six advisory teachers from vocational schools. These are important channels through which practical experience with apprenticeship regulations is transferred.

The *Länder* governments are responsible for education at vocational schools. This is coordinated by the Standing Conference of Ministers of Cultural Education and Cultural Affairs of the *Länder* (Kultusministerkonferenz). The Standing Conference develops the curricula and puts it on a par with the training regulations.

Generally, according to the expert interviews, the German vocational training system is assessed as being flexible in adapting to future skills needs. It remains to be seen if it can adapt fast enough to new challenges like the digitalisation of the labour market and attract enough apprentices in the light of increasing tertiary education participation and demographic change.

Technical colleges (Fachschulen)

Occupational associations have a large influence on the curricula of technical colleges, e.g. nursing colleges or medical colleges. Often these associations (e.g. the welfare association CARITAS) run technical schools by themselves. However, in some fields like child care where educational aspects became more and more important in the last years, *Länder* ministries also exert their influence.

The involvement of occupational associations can be seen ambiguous: On the one hand, they are very well informed on sector-specific skills needs. On the other hand, they have no interest in reducing the number of persons in training in their field.

Further vocational training

The further training governance system is organised into three columns: Unregulated company-internal further training, further training of unemployed persons under the leadership of the Federal Employment Agency, and the (private) further training sector.

The main stakeholders involved in steering further training provision are therefore the companies themselves. They can react very quickly to changing skill needs by adapting their further training measures.

In the private training sector, market mechanisms steer the further training offer of actors like universities, industry- and trade chambers, Volkshochschulen (adult education centres providing evening classes), or private further training institutes.

The most regulated part of further training is vocational further training leading to the *Meister* degree within the dual vocational training system. A new trend is the establishment of further training courses within universities.

Further training measures for unemployed persons are developed by actors in the private further training sector and approved by the Federal Employment Agency. However, these measures are often aimed at improving general skills, e.g. by offering job application training.

The effectivity of this system is hard to assess. On the one hand, further training can quickly and easily be adapted to local skills needs. On the other hand, the value of some further training qualifications in the labour market is often unclear. It has been argued by some experts that the German system would benefit from a more regulated and certified further vocational training system.

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Annex

Name of skills assessment instrument	Authors	on behalf of...	type of data projected / assessed	Special (methodological) features	focus on skills demand or skills supply?	Forecasting / Assessment period	geographical coverage	carried out regularly?	Link
Arbeitsmarkt 2030 (labour market 2030)	Economix Research & Consulting (ERC, Germany), Institute for Employment Research (IER, United Kingdom), Cambridge Econometrics (CE, United Kingdom), Fraunhofer Institute of Labor Economics and Organization (IAO, Germany), Institute for Research in the Social Sciences (ISF, Germany), and Research Centre for Education and the Labour Market (ROA, Netherlands)	Federal Ministry for Labour and Social Affairs (BMAS)	persons employed and labour force by qualification, by occupation, by sector, by company size	forecasting based on scenarios reflecting the possible future development of the German labour market	both	long-term (up to 2030)	national, regional	yes	click
QuBe – Qualifikation und Beruf in der Zukunft (qualification and occupation in the future)	Institute for Employment Research (IAB), Federal Institute of Vocational Education (BiBB), Institute of Economic Structures Research (GWS), Fraunhofer Institute for applied Information Technology (FIT)	Institute for Employment Research (IAB), Federal Institute of Vocational Education (BiBB)	persons employed and labour force by qualification, by occupation, by sector; persons in training	two supply forecasts in the first and second wave	both	long-term (up to 2030)	national, regional	yes	click

Name of skills assessment instrument	Authors	on behalf of...	type of data projected / assessed	Special (methodological) features	focus on skills demand or skills supply?	Forecasting / Assessment period	geographical coverage	carried out regularly?	Link
Deutschland Report (Germany Report)	Prognos AG	/	A wide range of indicators, including labour market indicators	Also considering global developments	both	long-term (up to 2040)	national	yes	click
Zukunftsatlas Regionen (future atlas of the regions)	Prognos AG	/	a range of demographic, labour market, and economic indicators for 402 German municipalities	Includes a ranking of German municipalities	both	short-term	Regional / local	yes	click
Gemeinsame Fachkräftestudie Berlin-Brandenburg (skilled workers study Berlin – Brandenburg)	Prognos AG	Ministry / Senate for Social Affairs Brandenburg / Berlin, ESF-funded	Skilled workers demand	Includes policy recommendations	Skills demand	Long-term (up to 2030)	Regional	/	click
EQUIB Bremen	IAW (Institute for Work and Economy), University Bremen	City (and <i>Bundesland</i>) Bremen, ESF-funded	Skills monitoring (training potential, qualification)	Project started in 1990 and ended in 2008	Skills supply	Short-term	Regional / local	yes	click
MINT Trendreport	IW Cologne	Employers' associations (BDA, VDI...)	qualifications and occupation threatened by skilled workers shortage	Focus on MINT-occupations (mathematics, engineering, natural science, technical)	both	Short-term and medium-term	national	yes	click

Name of skills assessment instrument	Authors	on behalf of...	type of data projected / assessed	Special (methodological) features	focus on skills demand or skills supply?	Forecasting / Assessment period	geographical coverage	carried out regularly?	Link
Fachkräftemonitor (skilled workers monitor)	WifOR GmbH	Industrie- und Handelskammern (IHK – German Industry and Trade Chambers)	qualifications and occupation threatened by skilled workers shortage	Interactive, customisable website	both	long-term (up to 2030)	Regional and sub-regional for several Länder (e.g. Bavaria)	/	click
Themenreport Pflege 2030 (care report 2030)	Center for Social Policy (ZeS) at the University of Bremen, Evangelische Hochschule Freiburg	Bertelsmann Stiftung	persons in need of care, labour force in the care sector (skills shortages)	forecasting based on scenarios reflecting the possible future development of the care sector	both	long-term (up to 2030)	national, regional, local	no	click
PROSIMA – econometric forecasting and simulation model of apprenticeship market	Federal Institute of Vocational Education (BiBB), Ruhr University Bochum	Federal Ministry for Education and Research (BMBWF)	Vocational training places and school graduates	the forecast is based on several behavioural equations, in 2015: alternative scenario	both	short-term (up to 1 year)	national	yes	click
Hessischer Pflegemonitor	IWAK	Hessian Ministry for Social Affairs, ESF-funded	Sectoral (care occupations)	Very small-scale forecast	Both, focus on demand	long-term (up to 2030)	Regional and sub-regional (local)	/	click
Federal Employment Agency: Engpassanalyse	IAB, Federal Employment Agency	Federal Employment Agency	Information about occupations threatened by skilled workers shortage	based mainly on time needed to fill a vacancy	Both	Short-term	National, regional	yes	click
Name of skills assessment instrument	Authors	on behalf of...	type of data projected /	Special (methodological) features	focus on skills demand	Forecasting / Assessment	geographical coverage	carried out regul	Link

			assess ed		d or skills supply ?	period		arly?	
Federal Employment Agency: Arbeitsmarktmonitor / Fachkräfte radar (skilled workers radar)	IAB, Federal Employment Agency	Federal Employment Agency	General, customizable internet information platform	Customisable, available for all persons interested	General information about (local) labour market needs	/	Local	/	click
Arbeitsmarktbarometer (labour market barometer)	Institute for Employment Research (IAB)	Federal Employment Agency (BA)	unemployment rates	survey among local employment agencies	Skills supply	short-term (forecast of the next month)	national	yes	click
VDI/IW Ingenieurmonitor (engineer monitor)	IW Cologne	Association of German Engineers (VDI)	Engineering occupations	Based on Federal Employment Agency data	Both	Short-term	National, regional	yes	click
BIBB/AuA Erwerbstätigenbefragung (survey among persons employed)	Federal Institute of Vocational Education (BIBB), Federal Institute for Occupational Safety and Health (BAuA)	/	Skills of persons employed	Survey among persons employed	Skills supply	/	National	yes	click
IAB Stellenangebots-erhebung (IAB job vacancy survey)	Economix Research & Consulting	IAB	Expected recruitment activities by occupation and qualification	Survey among companies	Skills supply	Next three years		yes	click

