Intellectual Output 1

Apprenticeship Comparison Study

within the project

European Apprenticeship Talent Programme (EATAP)

In the Partner Countries

- Austria
- Germany
- Lithuania
- United Kingdom

Lead Partner: Styrian Association for Education and Economics

Version FINAL

Date: 22nd of October 2018

Co-funded by the Erasmus+ Programme of the European Union

Table of Content

1. Introduction

1.1. According to the proposal the aim of IO1 is:

"STVG, as strategic researchers and policy influencer's, will lead on a research, analysis & data gathering study that will undertake comparative analyses of existing Apprenticeship (training) provision in International Programmes within the partnership. All partners will contribute and work on a local level with key stakeholders and local businesses and apprenticeship providers.

The study will take an action based collaborative approach, engaging with all project partners at an early stage in the design process.

It will compare apprenticeship delivery across HE, VET public and private sector partners with a particular focus on the STEM sector. The study will collect information and map the experience of each partner environment and build a picture of apprenticeship provision to cover topics such as:

- Employment outcomes
- Pathways in to apprenticeships
- Regulatory frameworks
- Alignment to labour market needs
- Quality Assurance
- Information, Advice and Guidance
- Apprenticeship Matching
- Certification and accreditation

Innovation – this research will provide comparative experiences across several learning environments and in particular focus on the outcome for learners. It will take a sector wide approach and involve all parties who contribute directly or have a strategic input in apprenticeship delivery, rather than focusing on an individual sector or case study. It will be therefore highly innovative.

Dissemination will be carried out through our usual academic channels, but also through partners who will use their national and international networks to reach non-traditional audiences. The project will also seek to impact on policy makers directly; again through our extended partner network.

Expected Impact – the study will stimulate innovation in apprenticeship delivery by acting as a benchmark and in setting out the actions that will provide the added value of the European Talent Programme and the internationalisation of apprenticeship training through a practical model that can be implemented via Erasmus+ mobility programmes and/or private sector investment.

Transfer of knowledge – knowledge exchange will be at the heart of the Apprenticeship Comparison Study and will take the form of qualitative approaches such as interviews and workshops at management meetings and quantitative analysis through data exchange

Design research gathering process - combination of survey/interview- quantitative/qualititive data to include:

- Data gathering
- Interviews
- Analysis of Data
- Drafting Study
- Partnership evaluation of Study
- Final of Study
- Dissemination of Study

End Date: 30.04.2018"

1.2. Methodology

The methodology was agreed with the partners within the start- up meeting on 6th of February 2018 in Plymouth.

According to the structure of the study desk research and finding answers to the questions will be undertaken from the partners and STVG.

1.3. Aim within the project

This Study aims to feed the process of the project with information to be able to elaborate the other Intellectual Outputs. A Feasibility Study for the European training will sum up the conclusions of the comparison study and is the basis for further discussion within the project partners.

The documents and references delivered during the study development are integral part of the Comparison study. Due to practical handling not all Annexes are integrated in this document, please look in WIKI https://wiki.soluvia.de/confluence/display/EAT/IO1+-+German+Apprenticeship+Comparison+Study as well as in the huge sources collected in the references in this Comparison Study

1.4. The understanding of different terms within the project

The understanding of **Apprenticeship** in the project:

Apprentices must

- have a contract with a company,
- must be mainly trained in a company
- must be trained also at school

Ideally companies and schools are working together for the VET Training of the apprentices.

Agreement of the partners with this definition:

MVV Energie agree with this definition. In Germany we have an also formal association with our school over the "Lernfeld" (learning fields) cooperation, where projects are defined between school and companies which are practically done in the company and theoretically anchored in the school subjects.

As an example, cooperation meetings between the vocational school and the training companies take place every quarter among the electronics technicians and mechatronics technicians.

Here a lively exchange takes place on current and organizational topics, as well as current appointments.

In addition, a simulation of the situational discussion phase in cooperation between the various training companies and the vocational school takes place in preparation for the final examination part 1.

In this case, the trainees receive a project tailored to their level of training. The vocational school provides theoretical training, while practical training is provided in the training companies. In the course of the project work, documentation is also prepared. The project is then concluded with a presentation of the projects in the vocational school.

The trainees present their results to an examination board consisting of a vocational school teacher and a company trainer. Subsequently, technical questions are asked about the project and the trainee receives a grade which is included in the vocational school certificate.

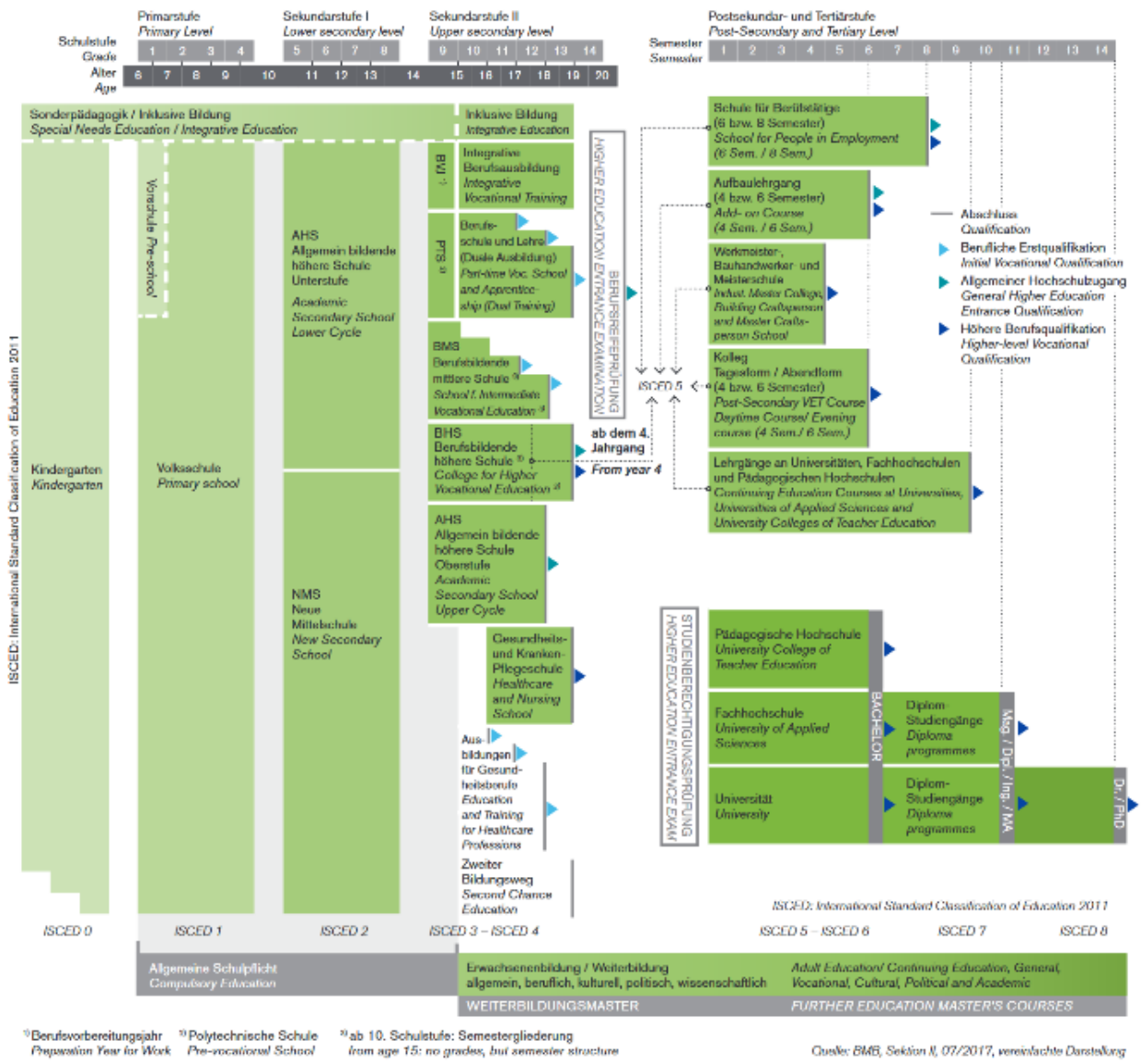
United Kingdom

Apprentices will gain valuable qualifications while they work and get paid. With an Apprenticeship through City College Plymouth, Apprentices willl:

- Work full-time and be contracted to a company/employer
- Earn a wage and enjoy more than 20 days off on full pay
- Train whist at work
- Get great work experience and qualifications to add to your CV
- Undertake training at City College Plymouth
- Experience a course on an outstanding Apprenticeship programme
- Get the support you need to succeed (our apprentice success rates are well above average)
- Take advantage of all the College perks, including the restaurant and hair and beauty salons

2. Education Systems per Country

2.1. Austria



2.1.1. Key features of the Austrian Education System

According to the Austrian Federal Constitutional Law Article 14 - as amended **(Bundesverfassungs-Gesetz, B-VG, Art. 14)** democracy, humanity, solidarity, peace and justice, openness and tolerance towards everyone regardless of race, social status and financial background are fundamental principles of education in Austria.

2.1.2. Key features related to governance

- Concerning **kindergartens** and **crèches** the **provinces** **(Bundesländer)** are responsible for legislation and implementation and maintained to high degree by municipalities **(Gemeinden)**. However, there is also a large private sector.
- Concerning schools responsibilities for legislation and its implementation are divided between the federation (Bund) and the provinces **(Bundesländer)** where it is executed by the parliaments of the provinces and the **Ämter der Landesregierungen**. In specific matters enumerated in the **Constitution**, the federation sets the framework, while detailed legislation is implemented by the parliaments of the provinces (Landtage). The federation has overwhelming responsibility for the education system, including virtually all areas of school organisation, the organisation of school instruction, private schools as well as the remuneration and retirement law governing education staff.
- Legislation and execution of all matters pertaining to **universities and higher education** is a federal responsibility. The freedom of scholarship and teaching, and the freedom of art, are guaranteed in constitutional legislation.

2.1.3. Key features related to organisation and structures

Since 2010 **obligatory** **kindergarten** **attendance** was introduced for 5 year olds (i.e. children one year before school entry).

An important aspect of the Austrian school system is the strong **diversification of programmes at all levels** of education. Austria has put in place a **strong vocational education sector**.

Traditional **early streaming** (at ages 10 and 14) has been subject of on-going educational reforms.

General compulsory schooling lasts until the age of 15 in Austria. Since the 2016/17 school year all youths who have not yet reached the **age of 18** will be required to **engage in**

education or training after completing general compulsory schooling. They should as far as possible complete some form of education or training that goes beyond the compulsory school-leaving qualification.

Quality assurance and development was driven forth in the school sector by the following measures:

- National educational standards
- Standardised, competence-oriented matriculation (and diploma) examinations (Reifeprüfung/Reife- und Diplomprüfung)
- National Report on Education

Based on the **Act on Quality Assurance in Higher Education** the **Agency for Quality Assurance and Accreditation Austria** (AQ Austria) was set up.

Reform of teacher training and reform of teachers service code and renumeration. The new teacher training scheme provides for the following cornerstones:

- Training is in principle geared towards the pupils' age brackets (primary level, secondary level)
- **Bachelor's degree** programme, eight semesters, 240 ECTS points
- **Master's degree** programme, two to three semesters, 60 to 90 ECTS points. The master's degree programmes can be completed on a part-time basis
- One-year professional **entry phas**e (induction), supported by experienced pedagogues as mentors.

The switch to bachelor's degree programmes in the primary sector was completed in 2015/16, in the secondary sector in 2016/17. The new master's degree programmes will begin by the winter semester 2019/20 at the latest.

New Legislation on the **Employment of Teachers**: This new legislation on employment and payment extends the room for manoeuvre and decision-making at school level (expansion of school autonomy). The new law concerns new entrants to the profession, who have a five-year-option to choose between the existing regulation and the new one. It fully applies to new teacher students. It was agreed upon higher initial salaries and an increased teaching assignment of 24 teaching units (50 minutes) per week.

As a result of the LLL Strategy, in 2012 the **Adult Education Initiative** (IEB) was launched by the federal and provincial governments. This initiative aims to enable adults who lack basic skills and/or have not acquired a compulsory school qualification to resume and complete their education and training and to obtain their qualifications even after completion of general compulsory schooling.

2.1.4. Stages of the Education System

In September 2010 obligatory **kindergarten** attendance was introduced for 5 year olds.

School education is **compulsory** for nine years and starts at the age of 6.

Primary school is the general compulsory school for pupils aged 6-10 (years 1 to 4).

The lower secondary level (years 5 to 8) comprises:

- New secondary school **(Neue Mittelschule)**
- Lower level of academic secondary school **(Allgemein bildende Höhere Schule)**.

The **upper secondary level** (years 9 to 13) comprises a

- general education branch and a
- vocational branch.

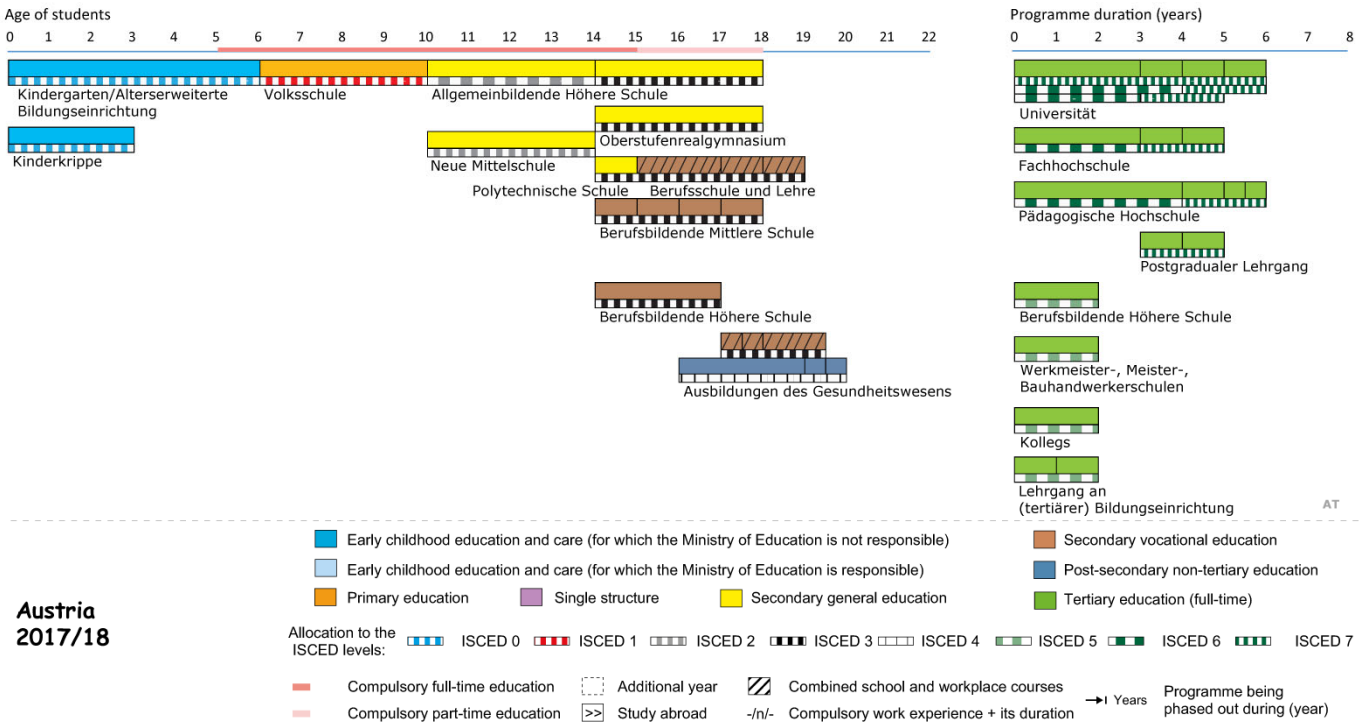
Higher education is provided by

- Public Universities (the biggest sector),
- **Private Universities**,
- Universities of Applied Sciences **(Fachhochschulen)**,
- University Colleges of Teacher Education **(Pädagogische Hochschulen)**

Adult learning programmes may lead to legally regulated qualifications (also called formal qualifications). They include second-chance programmes, for example: These are programmes that aim at the acquisition of qualifications by adults in the formal education sector (e.g.

- the compulsory schooling qualification **(Schulfähigkeit)**,
- the apprenticeship-leave certificate **(Lehrabschlussprüfung)**,
- the final certificate from schools for people in employment **(Berufsreifeprüfung)**

2.1.5. Schematic Structure of the National Education System



Eurydice 2017-2018

Source: https://eacea.ec.europa.eu/eurydice//national-policies/eurydice/file/at201718_enAT_2017_18.png

2.1.6. Useful links

Further information may also be found on the following websites:

- **The Austrian Education System**
- **VET Schools and Colleges in Austria**
- **Higher Education in Austria**
- **Education and Training Monitor 2017 – Austria**
- **Federal Ministry of Education, Science and Research [Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF)]**

2.2. Germany

2.2.1. National Specificities of the German Education System

In the Federal Republic of Germany responsibility for the education system is divided between the Federation and the Länder. The scope of the Federal Government's responsibilities in the field of education is defined in the Basic Law (*Grundgesetz*). Unless the Basic Law awards legislative powers to the Federation, the Länder have the right to legislate. Within the education system, this applies to the school sector, the higher education sector, adult education and continuing education. Administration of the education system in these areas is almost exclusively a matter for the Länder.

In addition to the division of responsibilities described above, the Basic Law also provides for particular forms of cooperation between the Federation and the Länder within the scope of the so-called joint tasks (*Gemeinschaftsaufgaben*).

Early childhood education and care is not part of the state-organised school system in Germany but almost exclusively assigned to the child and youth welfare sector. On the federal level, within the framework of public welfare responsibility lies with the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (Bundesministerium für Familie, Senioren, Frauen und Jugend – BMFSFJ), on the level of the Länder, the Ministries of Youth and Social Affairs and, in part, also the Ministries of Education and Cultural Affairs, are the competent authorities.

Following the primary school stage, after grade 4 (in Berlin and Brandenburg after grade 6), an early division into the educational pathways *of Hauptschule*, *Realschule* and *Gymnasium* takes place.

Vocational education and training takes place in the duales System. Training is carried out in two places of learning: at the workplace and in a *Berufsschule* (vocational school).

2.2.2. Stages of the Education System

Early Childhood Education and Care

Early childhood education is provided by institutions catering for children until the age of six at which they usually start school. Children of school age who have not yet attained a sufficient level of development to attend a school have a further option in some Länder,

namely *Schulkindergärten* and *Vorklassen*. These institutions are either assigned to the early childhood or the primary sector according to the particular Land.

Compulsory Education

As a rule, general compulsory schooling begins for all children in the Federal Republic of Germany in the year in which they reach the age of six and involves nine years of full-time schooling. Those young people who do not attend a full-time general education school or vocational school at upper secondary level once they have completed their period of compulsory general schooling must still attend part-time schooling (compulsory *Berufsschule* attendance – *Berufsschulpflicht*). This usually lasts three years.

Primary Education

As a rule, in the year in which children reach the age of six, they are obliged to attend primary school. All pupils in Germany enter the *Grundschule* which in almost all Länder covers grades 1 to 4 (in Berlin and Brandenburg grades 1 to 6).

Secondary Education

Following the primary school stage, secondary education in the Länder is characterised by division into the various educational paths with their respective leaving certificates and qualifications for which different school types are responsible. Once pupils have completed compulsory schooling they move into upper secondary education. The range of courses on offer includes full-time general education and vocational schools, as well as vocational training within the *duales System* (dual system).

At school types offering one course of education all teaching is channelled to a specific qualification. These have traditionally been the *Hauptschule*, *Realschule* and *Gymnasium*. *Schularten mit mehreren Bildungsgängen* (schools offering more than one type of course of education) bring two or three courses of education under one umbrella. In most of the Länder they have meanwhile led to the abolition of the *Hauptschule* and *Realschule*.

For pupils with *sonderpädagogischer Förderbedarf* (special educational needs), additionally various types of *sonderpädagogische Bildungseinrichtungen* (special schools),) have been set up within the organisational framework of general and vocational education.

Once pupils have completed compulsory schooling – generally when they reach the age of 15 – they move into upper secondary education. The type of school entered depends on the

qualifications and entitlements obtained at the end of lower secondary education. The range of courses on offer includes full-time general education and vocational schools, as well as vocational education and training within the *duales System* (dual system).

Tertiary Education

The tertiary sector encompasses institutions of higher education (universities, *Fachhochschulen*, colleges of art and music) and other establishments that offer study courses qualifying for entry into a profession to students who have completed the upper secondary level and obtained a higher education entrance qualification.

Additionally there are a number of special higher education institutions which only admit certain groups, e.g. higher education institutions of the Federal Armed Forces and *Verwaltungsfachhochschulen*, and are not considered below.

Those with a higher education entrance qualification may also choose to enter a *Berufsakademie* offered by some Länder as an alternative to higher education. At state or state-recognised *Studienakademien* (study institutions) and in companies students receive academic but, at the same time, practical career training.

The *Fachschulen* and the *Fachakademien* in Bayern are institutions of continuing vocational education that, as a rule, call for the completion of relevant vocational education and training in a *anerkannter Ausbildungsberuf* (recognised occupation requiring formal training) and relevant employment. The qualification level achieved here is comparable to the first level of the tertiary sector in accordance with the International Standard Classification of Education ISCED.

Adult Education and Lifelong Learning

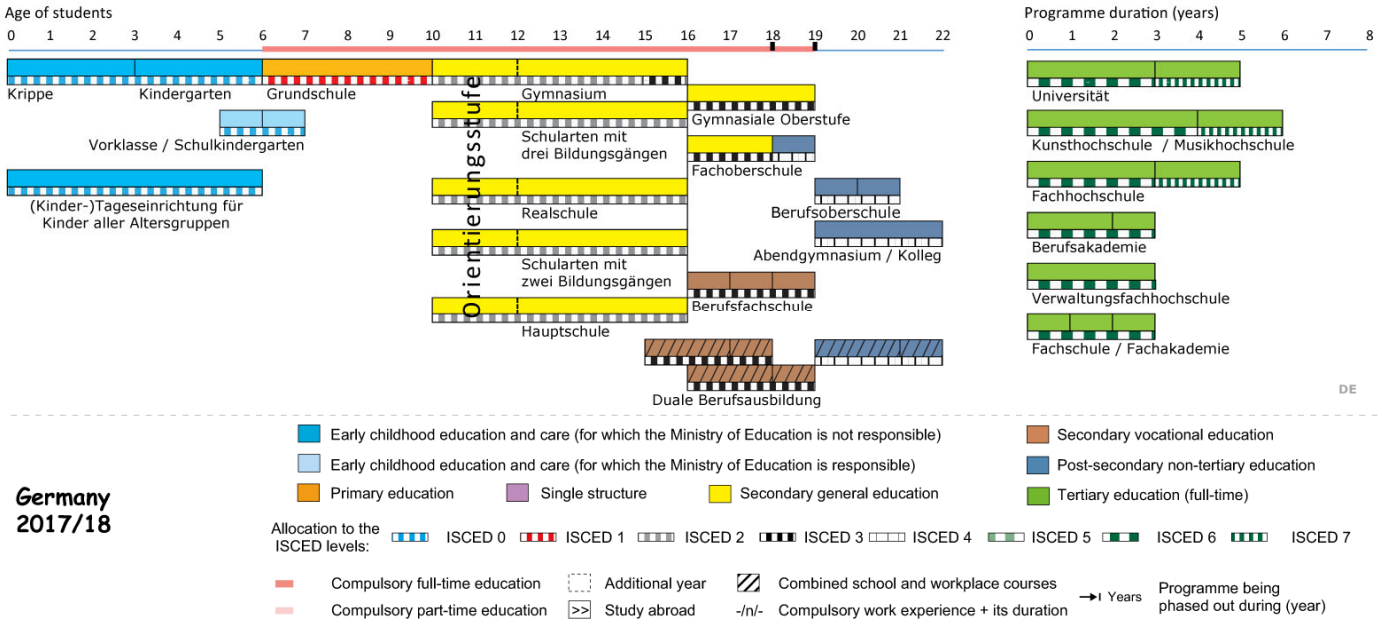
The activities of the state in the field of continuing education are, for the most part, restricted to laying down principles and to issuing regulations relating to organisation and financing. Such principles and regulations are enshrined in the legislation of the Federal Government and the Länder. State regulations are aimed at establishing general conditions for the optimum development of the contribution of continuing education to lifelong learning.

As part of lifelong learning, continuing education is assuming greater importance and is increasingly becoming a field of education in its own right. In response to the vast range of demands made on continuing education, a differentiated structure has been developed. Continuing education is offered by municipal institutions, in particular *Volkshochschulen*, as

well as by private institutions, church institutions, the trade unions, the various chambers of industry and commerce, political parties and associations, companies and public authorities, family education centres, academies, *Fachschulen*, institutions of higher education and distance learning institutions. Radio and television companies also provide continuing education programmes.

It is usually possible to acquire school-leaving qualifications later in life at evening classes (*Abendhauptschulen*, *Abendrealschulen*, *Abendgymnasien*) and in what is called *Kollegs*.

2.2.3. Structure of the National Education System



Eurydice 2017-2018

Source: https://eacea.ec.europa.eu/national-policies/eurydice/file/de201718png_enDE_2017_18.png

Useful links

While the Eurydice Description of National Education Systems provides comprehensive and comparable information, further information may also be found on the websites of the Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (*Ständige Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland* – KMK) and the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung* – BMBF).

Common European Reference Tools Provided by the Eurydice Network

- National Student Fee and Support Systems
- Organisation of the Academic Year in Higher Education
- Organisation of School Time in Europe (Primary and general secondary education)
- Recommended Annual Instruction Time in Full-Time Compulsory Education in Europe (Presented by grades/stages for full time compulsory education as well as by subject and country.)
- Teachers and School Heads Salaries and Allowances in Europe (Salaries and allowances of teachers and school heads at pre-primary, primary, lower secondary and upper secondary education levels.)

2.3. Lithuania

2.3.1. Key features of the Lithuanian education system

- Education is a priority of the state and it is publicly funded at all levels.
- Education is free for the learner at all stages, with one exception – higher education at which around half of the students enrolled need to finance their own studies.
- At most stages of education, the funding is based on „money follows the learner "principle allowing learners to choose between different public education providers.
- The education system is reasonably decentralised, national institutions, municipalities and education institutions share the responsibility for quality of education provided. The core curriculum is set at a national level but leaves room for local variation.
- The network of education institutions is large are both school and higher education levels in comparison with other states, considering the population of the country.
- The private sector of education providers is recognized and regulated by the government, in most levels of educations the learner that chooses a private institution bring in state funding in form of „vouchers "to the institution but the difference between the size of the voucher and the cost set by the private institution must be covered by the learner.
- Education institution inspections are organised at all levels of education and are organised by governmental institutions with the purpose of assuring quality.

- Pre-primary, primary and basic education is compulsory. Children usually attend the compulsory education stages from age 6 to 16.
- Learners are granted some freedom to choose study subjects at two final years of the basic education and it is expanded greatly at the levels of upper education and tertiary education.

2.3.2. Stages of the education system

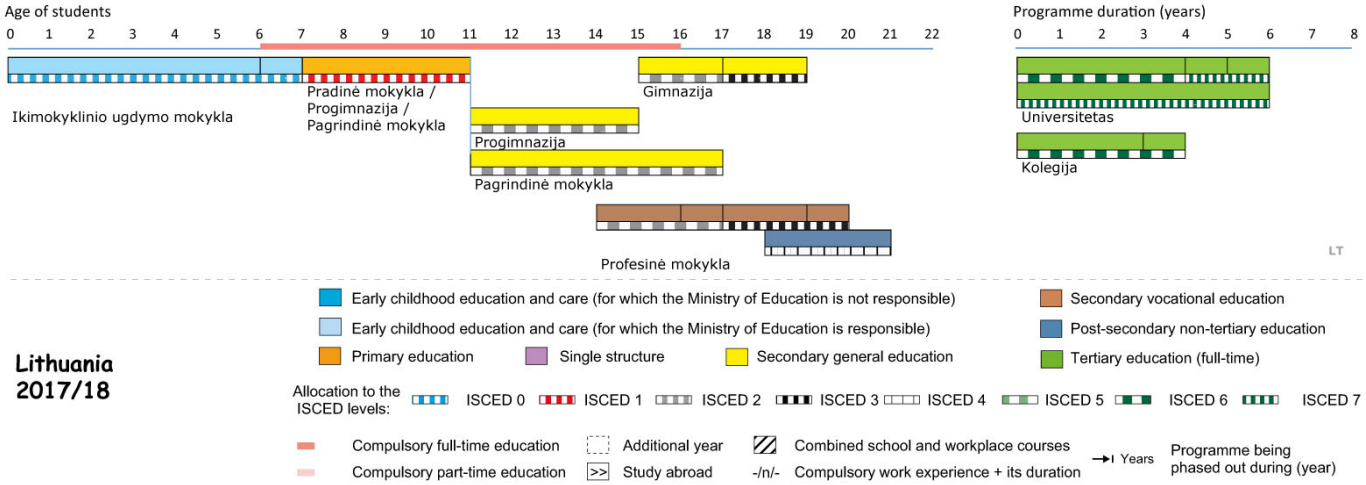
The system of education in Lithuania includes the following stages:

- **Early childhood education and care**: In Lithuania, early childhood education and care is composed of pre-school (*ikimokyklinis ugdymas*) and pre-primary (*priešmokyklinis ugdymas*) education and is attributed to the type of non-formal education. Early childhood education and care is provided for children. Pre-school education institutions fall under the authority of local governments. Attendance is compulsory for pre-primary education and optional for pre-school education.
- **Primary and basic education**: Children start compulsory education at the calendar year when they turn 7 years of age and start attend primary schools. Primary education is 4 years long and provides the learner with the fundamentals of learning, literature, social and cultural skills. It is delivered by primary schools (*pradinė mokykla*). Basic education is 6 years long and is also compulsory by law, it is delivered by pro-gymnasiums (*progimnazija*), basic education schools (*pagrindinė mokykla*), secondary schools (*vidurinė mokykla*), gymnasiums (*gimnazija*) and vocational schools (*profesinė mokykla*). Education is compulsory until 16 years of age at which the learner has usually finished the basic education course.
- **Upper-secondary and post-secondary level**: The two-year secondary curriculum is implemented by gymnasiums, secondary, vocational and other (e.g. The International Baccalaureate) schools for persons aged from 17 years to 19 years.
- **Higher education**: Higher education comprises two types of institutions: universities (universitetas) and colleges (kolegija). The upper-secondary leaving certificate is required by all higher education establishments. Person might enter higher education after upper-secondary general education, upper-secondary vocational education or post-secondary vocational education. The degree structure follows the three-cycle structure: bachelor's, master's and doctoral level studies. First cycle studies (Bachelor)

usually last 4 academic years, second cycle studies (Master) – 2 years and third cycle studies (Doctoral) – 4 years.

For further information, please consult the introduction articles of Organisation and Governance and of each educational level: Early Childhood Education, Primary Education, Secondary and Post-Secondary Non Tertiary Education,Higher Education and Adult Education and Training.

2.3.3. Structure of the national education system



Eurydice 2017-2018

Source: https://eacea.ec.europa.eu/national-policies/eurydice/file/lt201718_enLT_2017_18

For a brief description of other main topics regarding the national education system, please read the introduction article of Funding education, Teachers and Education Staff, Management and other educational staff, Educational support and guidance, Quality assurance, Mobility and Internationalisation.

For information on recently adopted or planned reforms and policy measures, please consult topic Ongoing Reforms and Policy Developments.

While Eurypedia provides comprehensive and comparable information, further information may also be found on the website of Ministry of Education and Science.

Common European Reference Tools Provided by the Eurydice Network

- National Student Fee and Support Systems
- Organisation of the Academic Year in Higher Education

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2.4. United Kingdom

2.4.1. Key features of the United Kingdom Education System England

Overall responsibility

Overall responsibility for the education system in England lies with the UK Government's Department for Education (DfE). Unlike Scotland, Wales and Northern Ireland, England does not have its own devolved government.

Responsibility for participation

It is the parent's responsibility to ensure a child of compulsory school age (5 to 16) receives efficient full-time education suitable to his age, ability and aptitude, and to any special educational needs s/he may have, either by regular attendance at school or otherwise.

Although education is compulsory, school is not, and parents may educate their child at home without seeking approval.

There is also a legal requirement on the young person (not the parent/carer) to do one of the following until 18 (although there is no sanction for non-participation):

- stay in full-time education
- start an apprenticeship or traineeship
- spend 20 hours or more a week working or volunteering, while in part-time education or training.

Local authorities have a duty to help children who are missing education get back into education. They must also promote the effective participation in education and training of 16 and 17-year-olds in their area and identify those who are NEET.

Governance and accountability

Reforms in the 1980s and 1990s changed the balance of responsibilities for publicly funded education outside of higher education. Schools became more autonomous as responsibility for staffing and budgets was delegated to each school's governing body. Further education colleges were incorporated as autonomous bodies. A national accountability framework was developed, with outcomes for learners, based on attainment in externally provided tests and qualifications, a major element. The other major element is external inspection by Ofsted, first established in 1992. A common inspection framework is used to inspect early childhood education and care providers, schools, colleges, work-based learning and adult education providers. Inspection reports are published. If inspection identifies important areas for improvement, the provider may be subject to intervention.

For schools, there have been further reforms since 2010. Academies now form a substantial minority of primary schools and a majority of secondary schools. For many of these schools, the multi-academy trust (MAT) model of governance has shifted accountability from the local governing body to a central trustee board. The role of regional schools commissioner was created to provide oversight of academies and has since expanded to cover underperforming maintained schools.

Although their role as a middle tier of management has greatly reduced since the 1980s, local authorities retain a duty to ensure a sufficient supply of school places, to support school improvement and to support vulnerable children and young people.

There is a strong tradition of private education in England. Independent schools, other than academies, receive no direct public funding.

School curriculum

The school curriculum is framed by broad aims to promote the spiritual, moral, cultural, mental and physical development of pupils at the school and of society and to prepare pupils for the opportunities, responsibilities and experiences of later life. Beyond these aims, first established by the Education Act 1944, there was no government control over the curriculum until a National Curriculum was introduced under the Education Reform Act 1988. This aimed to give pupils an entitlement to a broad and balanced curriculum and to set standards for pupil attainment. Re-enacted by the Education Act 2002, and last revised in 2014, the National Curriculum specifies compulsory subjects, programmes of study and entitlement areas for ages 5-16. It is not the whole school curriculum and sits alongside requirements for

religious education, sex education and careers education. It does not prescribe teaching hours. It is compulsory for maintained schools, but not for academies.

Pupils are organised into year groups according to their age but may be taught for some subjects according to ability. Grade repetition and early tracking into different study programmes are not features of the school system.

Qualifications

From age 14, the curriculum is framed by external qualifications, provided by independent awarding organisations and regulated by Ofqual. Qualifications are assigned one of nine levels of difficulty on the Regulated Qualifications Framework (RQF), which accommodates all regulated general and vocational qualifications outside of higher education.

As they are external, qualifications can be taken at any age, thus providing a structure for progression from school to adult learning.

Both general and vocational qualifications have undergone considerable reform since 2010, with the aim of improving relevance and rigour.

Higher education

Higher education institutions (HEIs) are private bodies that, subject to their degree-awarding powers, are free to design their programmes and awards and to determine the conditions on which they are awarded. There is no system for the accreditation of institutions, but institutions' capability to manage their own quality and standards is assessed by the Quality Assurance Agency for Higher Education (QAA), with the UK Quality Code as the reference point. Under the Higher Education and Research Act 2017, a new regulatory framework is being established, to be overseen by the Office for Students (OfS). The new framework seeks to facilitate new high quality providers to start up and achieve degree awarding powers, and subsequently secure university title. The OfS will operate the Teaching Excellence Framework (TEF) to recognise and reward high-quality teaching in HE.

There has been a shift from direct public funding for teaching to tuition fees backed by public loans, with new fee regimes introduced in 2006 and 2012.

Research is funded under a dual support system, with research infrastructure supported by quality-related block grant funding, and grants awarded for specific projects and programmes.

2.4.2. Stages of the Education System

ISCED 0

Part-time provision is free of charge to parents for all children from age 3 and for disadvantaged children from 2. For children of working parents, the entitlement was raised from 15 to 30 hours a week in 2017.

From age 4 to 5, most children attend a primary school reception class full time.

A common statutory framework regulates provision from 0 to 5 across all settings, including nursery schools, maintained primary schools and academies, private and voluntary settings and registered childminders.

ISCED 1

Full-time education is compulsory from the term following a child's 5th birthday.

Primary education consists of Key Stage 1 for ages 5 to 7 and Key Stage 2 for ages 7 to 11.

Primary schools are either maintained schools or academies. Almost all are mixed-sex and more than a third are faith schools.

National tests in English and maths at 11 are important for school accountability but do not influence admission to secondary school.

ISCED 2

Key Stage 3 is for ages 11 to 14. It is provided in secondary schools, catering for pupils from 11 to 16 or to 18/19.

Secondary schools are either maintained schools or academies. They can be mixed- or single-sex and around a fifth are faith schools. The great majority admit pupils without reference to academic criteria. In a few areas, grammar schools select their pupils on the basis of performance in an exam.

There are no national tests in Key Stage 3.

ISCED 3

Key Stage 4

Pupils normally continue at the same secondary school for Key Stage 4, which is for ages 14 to 16.

Attainment at the end of Key Stage 4 is measured mainly through GCSEs, which are single subject qualifications. Vocational qualifications including technical awards may be offered alongside GCSEs.

These qualifications are important for school accountability as well as for individuals' progression in education/training and transition to the labour market.

16 to 18/19

From age 16 to 18/19, young people must be in full- or part-time education or training. Depending on the local offer and their own preferences, they may continue at the same secondary school in the sixth form, transfer to another school sixth form, transfer to a sixth-form college or a further education (FE) college, or start an apprenticeship or traineeship. Most academic routes lead to three A levels (Level 3). FE colleges typically offer a wider range of vocational options. Vocational options include applied general qualifications at Level 3 in a vocational area and new technical qualifications (T levels) at Level 3 in a specific recognised occupation. Study programmes can contain a mix of general and vocational qualifications. For pupils not yet ready for study at Level 3, technical certificates, which relate to a specific industry, occupation or occupational group, can be studied at Level 2 (ISCED 2). Lower level (Level 1 and Entry Level) qualifications are also available.

Apprenticeships are work-based training programmes, open to all aged 16 and over and not in full-time education. Apprenticeships can be completed at different qualification levels, including advanced apprenticeships at Level 3 and intermediate apprenticeships at Level 2.

Traineeships are available for young people not ready to start an apprenticeship.

Adult learning

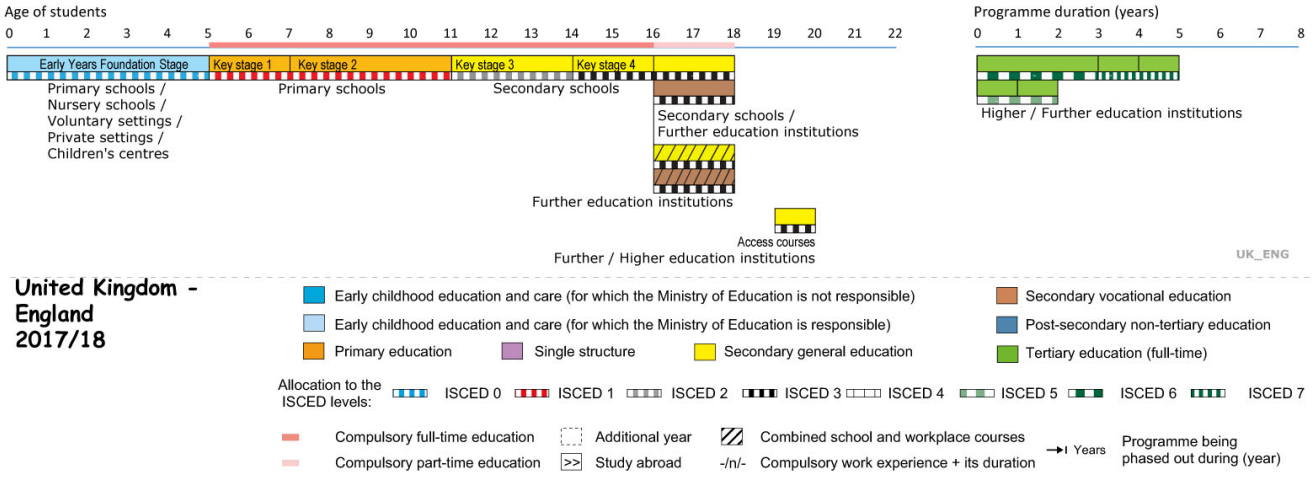
Adult learning includes provision to raise achievement in basic skills, which focuses mainly on English and maths qualifications, and apprenticeships. Most publicly funded programmes lead to a regulated qualification on the RQF. Other programmes aim to encourage the hardest-to-reach adults back to learning and employment.

ISCED 5,6,7,8

Programmes are structured on a five-level framework, which aligns with the five highest RQF levels and with three cycles of bachelor's, master's and doctoral studies. The framework includes short programmes, e.g. foundation degrees and postgraduate certificates.

Programmes are offered by HEIs, FE colleges, and alternative providers. Institutions determine their own admissions policies and there are wide variations in terms of competition for places. A levels are the most common entry qualification for young entrants to bachelor programmes, but other qualifications may be accepted. There are well-established routes, such as Access programmes, for mature learners who lack formal qualifications.

2.4.3. Structure of the National Education System



Article last reviewed December 2017

Source: https://eacea.ec.europa.eu/national-policies/eurydice/file/ukeng201718_enUK_ENG_2017_18

2.5. Conclusions of the Comparison of Education Systems

General remarks by the authors

A quick first look at the Eurydice Structure graphs of the Education systems in Austria AT, Germany DE. Lithuania LT, United Kingdom UK shows some important differences.

The systems in AT, DE are much more "splitted", in **different segments**, both, horizonal, and vertical, there are more interfaces and transition points, more **"selective"** phases and more differentiation in the organizational concept of the system.

That does not mean, that there is less differenziation in the systems in LT and UK, but, any differenziation in these countries is, at least until the end of compulsory school system at the age of 15,16,18 (it differs), more integrated into the systemic organizational elements, while in AT and DE differenziation is visible and expressed in the structural elements of school types and phases during the school pathways from the age 5 to 15,16,18.

Another feature which shows similarities and differences between the countries AT, DE, LT, UK is the degree of **centralization** and **decentralication**.

Although both countries AT and DE are federal republics, in AT educational law is national law, in DE law of the "Länder". But, several "Länder" in DE are bigger than the Federal Republic Austria.

In UK different regulations exist for England, Wales, Scotland, Northern Island. In the following concerns the main focus of information will be held on the situation in England.

Im LT education is based on national law, with dditional regulations for private provision, as it is also, in different ways, in AT, DE and UK

Concerning **Vocational education and training VET** in AT, DE the descriptions in Eurydice addresses this sector quite clear and with high priority at the upper secondary level. in Both countries exist VET provision in both tracks, full-time school and dual apprentice with part-time school. In AT the highest share of students at upper secondary education attend VET. Near 80%, half and half full-time-school and dual apprentice, in DE the share of apprentice students tend to 60%.

In the general descriptions of Eurydice for LT and UK the VET sector including the apprentice aspect (UK) is addressed, but not with the same clear position within the education system like in AT, DE.

In **AT, DE** most of the educational tracks are **strictly regulated by curricula, occupational profiles, national certificates**, while in **UK** mainly a **system of accredidation and certification** through private, but authorizised Institutions takes place.

That is also important to consider concerning the different ways to deal with apprenticeship within the **National Qualification Frameworks**, see **"Excourse 1"** in **"Open Sector".**

These features should be considered by implementing innovative concepts of education, instruction and training.

But, in all involved countries it should be possible to find innovative ways within the existing legal regulations and organizational frameworks.

3. Apprenticeship System per Country

3.1. Austria

3.1.1. Legal base – regulatory framework

Apprenticeship System in Austria – General Information

Apprenticeships and vocational training

An **apprenticeship** is a modern means of providing vocational training. It is a dual system which combines practical training with periods of school-based education to acquire key competences and knowledge of the theoretical aspects of a given trade. It is open to all young people who have completed nine years of compulsory education.

Apprentices receive practical on-the-job training within **companies**. In addition, they receive special theoretical instruction at **vocational schools,** with classes being held either on one or two days per week or within a block of classes over several weeks. ("dual system"). Depending on the chosen trade, an apprenticeship can last two, two and a half, three, three and a half or four years, and will always be concluded with a final examination.

On-the-job training within an enterprise provides the kind of **knowledge and skills** that is needed in order to become a **skilled worker** and become employed in the trade learned. Apprenticeship training produces excellent skilled labour no company can do without.

The **Vocational Training Act** (*Berufsausbildungsgesetz – BAG*, only available in German) includes the related statutory rules.

The major advantage of the dual system is its flexibility in accommodating a gradual re-design of training rules and developing new apprenticeship trades. This approach makes it possible for the system to respond to the requirements of business and labour markets and deliver training that is adjusted to changing needs.

Additional Information

- Apprenticeship (PDF, 1MB)
- Lehrberufsbezeichnungen (deutsch-englisch) (PDF, 353kB)
- Lehrberufsbeschreibungen (PDF, 1MB)
- Frequently asked questions (FAQs) (PDF, 34kB)

Source:
https://www.en.bmdw.gv.at/Vocationaltraining/Apprenticeshipsandvocationaltraining/Seiten/default.aspx

The apprenticeship system in Austria has a long tradition and is more than accepted: the image of VET and the dual system is quite good. 4 out of 5 young people at the age of 16 are either in a VET full-time school or in apprenticeship training. Nevertheless, the competitive situation with school-based VET options, the demographic development with a decrease of young people, and a shortage of skilled labour necessitate policy measures to enhance the attractiveness, image and quality of dual VET.

Competences (federal, regional)

The governance structure of the apprenticeship system involves a large number of actors. The tasks and competences in both the company-based part as well as the school-based part, are divided among several bodies on federal, regional and local levels (link to key feature 1 "Governance"). Leading ministry for the company-based part is the Ministry of Economy, for the school-based part it is the Ministry of Education. The social partners, who fulfil key tasks both regarding contents and administration of apprenticeship training, play a particularly important role.

History of the apprenticeship system

The beginnings of company-based VET date back to the **Middle Ages**. During that period, trade associations carried out so-called master craftsperson apprenticeships. Towards the end of the 19th century the public sector became involved in VET: The traditional craftsperson apprenticeship was complemented by school-based programmes.

In the period **following World War I**, major framework conditions were created for apprenticeship training which improved the protection of apprentices.

After World War II the range of provisions of the Trade, Commerce and Industry Regulation Act (Gewerbeordnung, GewO) was bundled in the first draft of the Vocational Training Act (Berufsausbildungsgesetz, BAG), which entered into force in 1969. The 1978 amendment of this Act is basically still valid today. Apprenticeship offices were set up in each province. The IVET trainer exam was introduced, which constitutes a prerequisite for becoming an IVET trainer. And the first steps were taken to list the job profiles, i.e. the in-company training curricula.

The image of VET and apprenticeship in society

At the upper secondary level, the Austrian education system is characterised by a **well-developed and differentiated VET system**. It consists of **full-time VET schools** (schools for intermediate vocational education [BMS] and colleges for higher vocational education [BHS]) and dual training (**apprenticeships**). Almost 80% of an age cohort in the tenth school year opts for a VET programme, with about half attending a school and half an apprenticeship.

Apprenticeship training is established in all economic sectors, particularly in the crafts and trades sector, but also in wholesale and retail, and in the tourism industry.

So, VET is attractive and has a good image in Austria. But there is competition between the different educational tracks in general and between the dual system and fulltime VET schools specifically. Demography with a decrease of young people has even increased this competition in the last years. Besides that, initial VET faces new challenges: The young people who take up an apprenticeship have diverse requirements. Many of them do not have sufficient basic skills after completing compulsory schooling, so they cannot find an apprenticeship place in a company. This fact has resulted in a differentiation of apprenticeship programmes in recent years: Inclusive VET programmes were introduced in 2003 to enable young people with learning difficulties to prolong their apprenticeship period or to acquire partial qualifications. To raise attractiveness and to increase permeability the "Berufsmatura" was introduced in 2008: it offers the possibility to obtain both a VET qualification and the higher education entrance qualification in one combined scheme.

Purpose

For the Austrian economy the apprenticeship system with its long tradition and a good image always has been the "usual way" to train young people to have enough skilled workers. The Economic Chambers "had their hand on the system" and the Social Partners ensured a relatively smooth development.

The demographic development, a possible shortage of skilled workforce and increasing (youth) unemployment rates, and finally the high number of refugees in 2015 brought VET and the apprenticeship system higher on the political agenda. In 2013 the government decided on an "Education and training guarantee" till the age of 18. And from 2018 on there will be the obligation for all young persons under 18 to either stay in school or do apprenticeship training (Ausbildungspflicht). The VET system with its variety of offers has

been identified as a realistic answer to many (new) challenges. Therefore, public money is used for additional supra-company training places or labour service measures.

Apprentices, companies and VET schools involved in apprenticeship training

The Apprenticeship Statistics, which includes key statistical data, are published every year by the Austrian Federal Economic Chamber. For 2015 the following key data can be given:

- At the end of 2015 there were **109,963 apprentices** in 29.164 Austrian companies. This corresponds to a decline of 4.4% compared to the previous year with a continuous tendency.
- **Two thirds** of all apprentices in 2015 were **male** (72,819), **one third female** (37,144).
- The **29,164 training companies** 2,714 fewer than the year before.
- **Distribution by economic sectors:** Most apprentices are trained in the crafts and trades sector (42.7%), followed by the wholesale and retail sector (14.4%) and industry (14.1%).
- Clear gender-specific trends are seen in the **choice of apprenticeship occupations**: Almost half of all female apprentices are trained as shop assistants, as office assistants and hairdressers. The three most popular apprenticeship trades among young men are metal technology, followed by electrical engineering and motor vehicle engineering.
- Although there are approximately 200 apprenticeship trades (cf. the List of Apprenticeships), young people choose few of them: More than two thirds of all female apprentices are trained in the **ten most popular apprenticeship trades**. Among young men, there is not quite the same concentration on the main apprenticeship trades: More than half of all male apprentices are trained in the ten most popular occupations. (https://www.wko.at/Content.Node/Interessenvertretung/ZahlenDa https://www.wko.at/Content.Node/Interessenvertretung/ZahlenDatenFakten/Daten_zum_Thema_Lehrlinge.htmltenFakten/Daten_zum_Thema_Lehrlinge.html).

For more information:

- Cedefop (2013/2014): Spotlight on VET AUSTRIA. Available at: http://www.cedefop.europa.eu/files/8048_en.pdf

- Economic Chambers (WKO) – on apprenticeship statistics: https://www.wko.at/Content.Node/Interessenvertretung/ZahlenDatenFakten/Daten_zum_Thema_Lehrlinge.html
- ibw (2014): Apprenticeship-type schemes and structured work-based learning programmes. Available at: http://refernet.at/en/component/docman/doc_download/474-atapprenticeshiparticle2014enfinal
- Refernet Austria: http://refernet.at/en/vet-in-austria/statistics
- Tritscher-Archan, S. (2014): VET in Europe – Country Report Austria. Report within the framework of ReferNet Austria. Vienna. Available at: http://refernet.at/en/component/docman/doc_download/486-atvetineurope2014en

Last Updated: 07 September 2016

Source: https://www.apprenticeship-toolbox.eu/austria/apprenticeship-system-in-austria

3.1.2. Apprenticeship Training in Austria – The Dual System

In Austria apprenticeship training takes places at two different sites: company-based training of apprentices is complemented by compulsory attendance of a part-time vocational school for apprentices [Berufsschule]. Thus, apprenticeship training is also referred to as "dual vocational training system" or as "dual system".

Currently about 40 per cent of all Austrian teenagers enter apprenticeship training upon completion of compulsory education. But although the overall number of apprentices just as the number of those entering apprenticeship training has been going back since 1981, 1997 saw the discontinuation of this trend, for the number of new apprentices increased again.

Upon completion of apprenticeship training about 40 to 44 per cent of all apprentices continue to work for the company where they were trained.

All in all about 40,000 companies train approximately 120,000 apprentices, which corresponds to an average of 3 apprentices per company.

The percentage of female apprentices increased slightly between 1975 and 1989, but has been decreasing ever since 1990 falling to a mere 31 per cent in 1996. The most popular apprenticeship trades among girls are retail-trade merchant, followed by hairdresser and office clerk. Among male apprentices the most popular occupations are motor-vehicle

mechanic, followed by electrician. More than 50 per cent of all apprentices are trained for the craftsmen's trades, other important sectors are commerce (16 %), the industry (11 %) and tourism and the leisure industry (10%).

Company-based training is regulated by the Federal Ministry of Economic Affairs and Labour while pedagogical matters fall into the province of the Federal Ministry of Education, Science and Culture.

Apprentices may only be trained in the legally recognized apprenticeship trades. These skilled trades (presently approximately 240) are included in the list of apprenticeship trades [Lehrberufsliste] published by the Federal Ministry of Economic Affairs and Labour in co-operation with the Federal Ministry of Social Security and Generations. Moreover, there are 14 legally recognized apprenticeship trades in the agriculture and forestry sector which are not included in the list.

The list contains the various occupations and informs about the duration of apprenticeship training as well as related apprenticeship trades including training time credits for already acquired vocational training.

Apprenticeship training lasts two to four years, in most cases, however, three years. In case of accreditation of other educational pathways (e.g. vocational schools, vocational training abroad) the period of apprenticeship may be reduced.

Moreover, the period of apprenticeship training may also be reduced for students holding certain qualifications. This especially benefits holders of the "Reifeprüfung"-Certificate for it increases their choice and makes it easier for them to find employment. Training for several occupations at the same time is possible provided certain requirements are met.

Company-based Training

Companies which train apprentices are obliged to provide apprentices with the skills and know-how stipulated in the occupational profile; this ensures a uniform minimum standard of training. Companies which are not able to provide training which covers the whole occupational profile may avail of the possibility of complementary training within a training network. Thus, even small companies may contribute their share to apprenticeship training.

Protection and Social Security

Company-based training constitutes the major part of apprenticeship training. Apprenticeship training agreements stating the conditions of training within the framework of a contract of employment are signed between the company and the apprentice.

Thus, an apprentice has got full social insurance including health, accident, retirement and unemployment insurance. The duties of a company which is entitled to train apprentices do go beyond the usual duties of an employer to quite some extent.

Apprenticeship training agreements are subject to the regulations of the industrial and social law and to protective labour legislation for teenage employees. Furthermore, the apprentice is entitled to a remuneration, which is fixed in collective labour agreements and varies according to the different apprenticeship trades.

Training in the Real World of Work

Apprentices spend most of the time of their apprenticeship training in the real environment of a manufacturing plant or a services enterprise. This does not only mean that they are fully integrated into the world of work but may also have a positive effect on their social skills, on their skills to cope with problems and on their ego.

One of the major advantages of this system, both for the apprentice as well as the company, is that apprentices may be employed as fully qualified skilled workers right upon completion of apprenticeship training.

Part-time Vocational Schools for Apprentices

Attendance of a part-time vocational school for apprentices [Berufsschule] is compulsory for apprentices who have signed an apprenticeship training agreement with a company.

Attendance of a part-time vocational school for apprentices starts with the beginning of the apprenticeship training agreement or another training agreement in compliance with § 30 of the Vocational Training Act and lasts until its end or the successful completion of the relevant part-time vocational school for apprentices.

The aim of part-time vocational schools for apprentices is to provide apprentices with the theoretical basics of the respective occupation, to promote and complement company-based training and to deepen their general knowledge.

Moreover, it has to provide interested apprentices with adequate preparation for the TVE-Examination by means of differentiated measures and voluntary subjects.

Thus, regulations for practical training, which are stipulated in the vocational profiles, are complemented by a special curriculum defining both the key issues of the technical theory and practical training for the respective apprenticeship trade, the latter taking place in workshops and laboratories.

Structure and Organization of Part-time Vocational Schools for Apprentices:

Education in part-time vocational schools for apprentices may take on the following organizational forms:

- day-release system with courses running for a complete academic year, apprentices attend school for a minimum of one full or two half days a week.
- block-release system with courses lasting for a minimum of eight or four weeks per year
- seasonal-release system, depending on the occupational sector classes may be held during a certain season only

Skeleton Curricula

The curricula of part-time vocational schools for apprentices are skeleton curricula which define educational objectives, contents and the procedures for the planning and realization of study processes. Some examples:

German and Communication Skills

The educational objective is to improve the students' communication and social skills and to broaden their vocabulary in order to provide them with the skills necessary to adequately voice and defend personal and business interests. Students who prepare for the TVE-Exam do receive additional support according to the qualification requirements.

The main criteria when it comes to defining the subject matter is its contribution to the improvement of the students' communication and co-operative skills. In order to meet this aim, the subject matter contains elements of verbal, non-verbal and written communication as well as spelling.

Career-related Foreign Language

The educational aim is to provide students with the qualifications necessary to cope with the demands of working as well as private life in a foreign language. Moreover, this subject aims at imparting knowledge which fosters the students' respect towards people of other cultures and their way of life.

The main criteria for the definition of the subject matter is its usefulness for the students' private and occupational life, especially when it comes to apprenticeship matters.

Civics

The educational aim is to provide the student with the qualifications necessary to play an active, critical and responsible part in society.

The main criteria when it comes to defining the subject matter is its contribution to the improvement of the students' understanding of the real world and of the gap between legitimate claims and reality as well as the representation of Austria's political, cultural, economic and humanitarian achievements.

The Subject Matter

The apprentice within his school and company environment. The apprentice's occupational and social environment. Contemporary history – Austria in the international community. The Austrian legal system. Austria's political system.

Business Education

Economics including business correspondence: The educational aim is to impart knowledge in the following subject areas: information and communication methods, papers, documents, contracts and payment systems, the basics of national economy and applied economics and some issues of economic policies.

Furthermore, students are to be provided with knowledge on income, financing, purchase and accounting as well as on the improvement of enterprises which might be of importance for his private and occupational life. The main criteria when it comes to defining the subject matter is the mathematical understanding of business matters.

Streaming

For pedagogical reasons and in order to provide special support to interested students, streaming (2 streams) takes places in one, two or three compulsory business and technical subjects.

The decision whether classes are sub-divided into student groups for language and practical training rests with the relevant executive school authorities. Moreover, the relevant executive school authorities may decide upon additional subjects for which teaching has to take place in student groups. In this context, special attention has to be paid to lessons which prepare for the TVE-Exam.

The Apprenticeship Leave Exam

The contract between the employer and the apprentice ends automatically after the stipulated period of time. At the end of apprenticeship training each apprentice may decide whether or not to take the Apprenticeship Leave Exam [Lehrabschlußprüfung]. This exam tests whether the apprentice has acquired the practical skills and qualifications relevant to his occupation and whether he is able to properly perform the tasks characteristic to the apprenticeship trade.

The Apprenticeship Leave Exam is divided into a practical and a theoretical part and consists of a written and an oral exam.

Provided that the apprentice has met the educational objectives of the last year of the respective part-time vocational school he is only required to do the practical part of the exam.

An Apprenticeship Leave Certificate often is of legal importance as well.

Further Education and Training

The Apprenticeship Leave Certificate provides the apprentice with access to two different vocational careers. On the one hand it is a prerequisite for the admission to the Master Craftsman Exam and for qualification tests, and on the other hand it gives access to higher education via the TVE-Exam or the Higher Education Entrance Exam which are prerequisites for taking up studies at colleges, universities, "Fachhochschulen", post-secondary courses and post-secondary colleges.

Outlook

The Austrian apprenticeship training system is highly practice-oriented and esteemed all over the country. In recent years, however, apprenticeship training has experienced a loss in attractiveness due to the poor permeability of educational pathways, the concentration of apprentices on a few occupations and the permanently decreasing willingness of Austrian enterprises to provide training facilities.

Thus, there is a strong demand for a reformation of the apprenticeship system in order to make apprenticeship trades more attractive. Reform measures are already carried out in co-operation with all parties involved.

The most important reform measures are:

- the creation of new apprenticeship trades in future-oriented fields,
- broadly defined training objectives – more comprehensive basic training and later specialization make it easier to find out about individual skills and interests and to act accordingly (reduction of drop-outs and the rate of those who change for another occupation),
- easier access to further education and facilitating transfer from the dual system to the full-time technical and vocational education system. The introduction of the TVE-Examination in 1997 has contributed enormously to the permeability of education systems,
- more flexible training schemes for practical training in companies just as for education in part-time vocational schools,
- permanent adaptation of the curricula to the ever-changing requirements of the labour market and development of appropriate means to guarantee high quality of training,
- financial support for companies which train apprentices,
- removal of bureaucratic impediments,
- more information about less popular and non-gender-specific occupations.

After successful completion of grade 8 (secondary level I) of compulsory education students may apply for admission to a technical and vocational school or college (secondary level II).

(https://bildung.bmbwf.gv.at/ministerium/telefonbuch/telefonbuch.html)

3.1.3. Apprenticeship in Austria

Depending on the chosen apprenticeship, training can last two, two and a half, three, three and a half or four years.

Parallel apprenticeship

The Vocational Training Act (*Berufsausbildungsgesetz – BAG*) permits simultaneous training in **two apprenticeship trainings** (*Doppellehre*) with one and the same employer qualified to provide such training.

The **period of apprenticeship training** is calculated as follows: halve total period of both trades and add one year, whereby the total time of parallel apprenticeship is not to exceed four years.

Parallel apprenticeship is not permitted for related trades that are subject to special regimes, i.e. where training periods may be mutually and fully credited and where one final examination qualifies for additional examination in the related trade.

Modularised apprenticeship

The option of entering training through a "modularised apprenticeship" was introduced in 2006.

Such apprenticeships begin with one **common basic module** to which several **main modules** are added. Having completed the basic and main modules, apprentices may go on to receive **in-depth training** in an optional **special module**. Modular apprenticeships in specific trades offer greater flexibility in training structure and presentation, improve options to combine modules, facilitate recognition of previously obtained qualifications and ensure a better response to industry's needs through special modules.

Related apprenticeship trainings

Apprenticed trades that use the same or similar tools and materials, or require the same or similar operations, are called **related apprenticeship trades** (*verwandte Lehrberufe*).

The extent of relationship is defined in the **list of apprenticeship trainings** . If trainees change their trade, the training periods spent in the related apprenticeship trade will be credited towards the new apprenticeship either in full or in part. Once the final examination

is passed in one apprenticeship, workers have the possibility to take an additional exam in the related trade.

Lexicon of apprenticeship

The lexicon provides an overview of all apprenticed trades currently available to candidates for apprenticeship in Austria.

https://www.en.bmdw.gv.at/Vocationaltraining/ApprenticedTradesInAustria/Seiten/default.aspx

16. APPRENTICESHIPS

WKO WIRTSCHAFTSKAMMERN ÖSTERREICHS

16.3 The ten most frequent apprenticeships 2016 [1]

GIRLS		BOYS	
apprenticeships	number	apprenticeships	number
Salesperson in retail trade	8,553	Metal industry technician	10,056
Office assistance	4,238	Electrical engineering	8,404
Hairdresser (stylist)	3,511	Motor vehicle engineering	6,751
Cook	1,267	Retail trade	4,909
Restaurant specialist	1,195	Installations & building technology	3,881
Pharmaceutic trade assistance	1,126	Bricklayer	2,843
Administration assistance	1,032	Joinery	2,812
Hotel & gastronomy assistance	966	Cook	2,524
Metal industry technician	875	Mechatronics	2,207
Pastry cook	761	Information technology	1,486
Total "TOP-10"	**23,524**	**Total "TOP-10"**	**45,873**
GIRLS total	**35,587**	**BOYS total**	**71,363**

[1] 31st December

source: WKO

Source: http://wko.at/statistik/jahrbuch/2017_Englisch.pdf

3.1.4. Governance

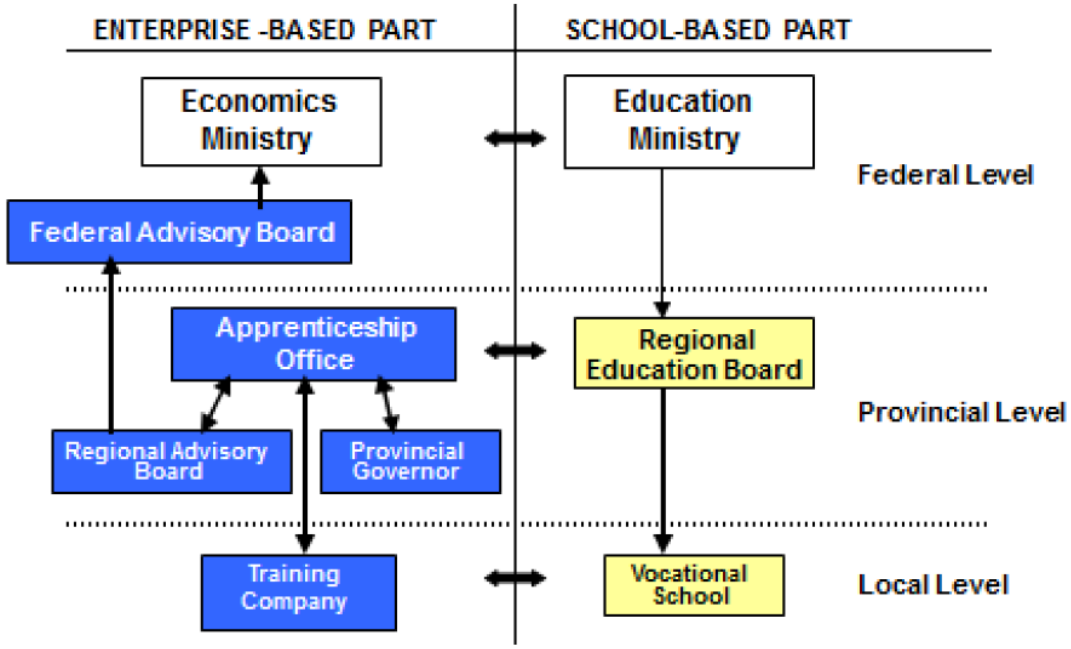
Governance of VET and regulatory framework

As shown in the following figure, a large number of institutions form part of the governance structure of apprenticeship training:

Fig. 9: Governance structure of apprenticeship training

Source: ibw

Fig. 9: Governance structure of apprenticeship training



Source: ibw

Federal level

The **Federal Ministry of Science, Research and Economy** (BMWFW) is responsible for the enterprise-based part of apprenticeship training. It is in charge of the Vocational Training Act (BAG), which provides the legal basis for this VET programme, as well as for the training and examination regulations which exist for each apprenticeship trade. Another central body on the federal level is the **Federal Advisory Board on Apprenticeship** (BBAB). This board is set up by the Ministry of Economy upon the proposal of the social partners (Austrian Federal Economic Chamber, Federal Chamber of Labour). Part-time vocational school teachers are co-opted as advisory members. The BBAB submits expert opinions to the Ministry of Economy, e.g. on the restructuring of apprenticeship trades or on structural reforms.

The **Federal Ministry of Education and Women's Affairs** (BMBF) is responsible for the school-based part of apprenticeship training. It issues framework curricula for part-time vocational schools for each apprenticeship trade. It is also in charge of the Federal School Organisation Act (SchOG) in which the provisions concerning the organisation of part-time vocational schools and the 14 cornerstones for the framework curricula are laid down. In addition, the Ministry bears 50% of the costs for teaching staff of part-time vocational schools.

Provincial level

At provincial level the **Apprenticeship Offices**, which are located in the economic chambers in the individual provinces, act as vocational training authority on behalf of the Ministry of Economy. They examine (jointly with representatives of the regional chambers of labour) the training companies' suitability to provide apprenticeship training in subject-specific and staff-related respects; in addition, they are responsible for examining and recording apprenticeship contracts. In principle it is their task to provide wide-ranging counselling to apprentices and training companies in all matters concerning apprenticeship. The apprenticeship-leave exams and subsidisation schemes for training companies are also handled by Apprenticeship Offices.

Set up in every province, **Regional Advisory Boards on Apprenticeship** (LBAB) provide counselling services in all issues related to VET. They are responsible for preparing expert opinions, proposals and suggestions directly related to the apprenticeship training system in the respective province. On their proposal, chairpersons of apprenticeship-leave examination boards are appointed by the heads of Apprenticeship Offices.

The **Provincial Governors** assisted by the respective provincial government offices are responsible for apprenticeship training and act as apprenticeship authority of the second instance. They decide on appeals in apprenticeship training matters, such as the withdrawal of the authorisation as a training company, and on cancellations of illegally registered apprenticeship training contracts. Provincial governors appoint the members of their respective LBAB.

Part-time vocational schools are within the sphere of competence of the respective province which is responsible for constructing and equipping them. Moreover, it is in charge of implementing the federal framework curricula for each apprenticeship trade and for supervising the schools in educational and technical matters. These duties are carried out by regional school inspectors of the **Regional Education Boards**. In addition, they finance half of the salaries of teachers of part-time vocational schools.

Local level

On local level the **training enterprises** with their authorised apprenticeship trainers are responsible for the provision of apprenticeship training. It is in their enterprise that the respective apprentice is trained to become a skilled worker. In this work they are assisted by IVET trainers. In various sectors of industry, apprenticeship counsellors are appointed to

provide subject-specific counselling to training enterprises. Working in close cooperation with the LBABs, their two prime tasks are to advise the authorised apprenticeship trainers in the appropriate design of the individual enterprise-based training programme and, in particular, to promote cooperation between training enterprises and part-time vocational schools.

Part-time vocational schools form an integral part of the economic life of their respective location. Direct contact with training companies in the region is a key prerequisite to ensure they optimally fulfil their educational task.

VET-research

VET research is primarily done by non-university institutes, in particular, by the institutes affiliated to the social partners, i.e. ibw Austria – Research and Development in VET (affiliated to the Federal Economic Chamber) and the öibf – Austrian Institute for Research on Vocational Training (affiliated to the Chamber of Labour and the Austrian Trade Union Federation). These research institutes are involved in a number of tasks within apprenticeship training: They conduct needs analyses for new apprenticeship trades, support the Ministry of Economics in designing training and examination regulations, compile the apprenticeship-leave examinations for the majority of apprenticeship trades, and issue information and counselling materials on apprenticeship training. Moreover, at ibw the Clearing Office for the quality assurance of the apprenticeship-leave examination is set.

Biannually, ibw and öibf compile a report about the "Situation of Youth-Employment and Apprenticeship in Austria" (edition 2014). As stipulated in the Vocational Training Act, this report has to be submitted to the National Council, providing the basis for discussions and reforms. Additionally, an annual report published by ibw gives a statistical overview of structural data, trends and perspectives of apprenticeship in Austria. Furthermore, ad-hoc research projects on apprenticeship training commissioned by various stakeholders are carried out by ibw and öibf, e.g. cost-benefit analysis, the overall evaluation of the apprenticeship support system, etc.

Regulatory framework

Apprenticeship training is regulated by a number of laws and regulations. In the following, the major legal bases of the enterprise-based part and the school-based part, are listed and their contents outlined. (N.B.: The German abbreviation "BGBl." stands for Federal Law Gazette.)

Enterprise-based part

The enterprise-based part of training is regulated by the **Vocational Training Act** (*Berufsausbildungsgesetz*, BAG, BGBl. no. 142/1969 as amended), which is within the sphere of competence of the Federal Ministry of Science, Research and Economy (BMWFW).

Training regulations stipulate the job profile specific to the respective apprenticeship trade. This job profile is the curriculum for the training company. In a catalogue broken down by apprenticeship years, the job profile covers the professional competences which the apprentice must be taught in the course of company-based training. For newly regulated apprenticeship occupations, not only job profiles but also activity descriptions are formulated, which lay down, in the form of a short list, the occupational requirements the trained apprentice is able to meet. Also included in the training regulation are provisions concerning the apprenticeship-leave examination. Training regulations are valid across Austria.

In the field of apprenticeship, collective bargaining agreements (CBAs) also play a major role. They are the result of negotiations between representatives of the Austrian Federal Economic Chamber and the unions. The majority of CBAs refer to entire sectors and are binding on all companies of the respective sector. Some large companies have their own CBAs. Regarding apprenticeship training, CBAs specify minimum remuneration to be paid to apprentices during their apprenticeship period. The apprenticeship contract is entered into between the authorised apprenticeship trainer and the apprentice and forms the basis of vocational training in the dual system. It must be concluded in writing. In case of underage apprentices, the apprenticeship contract must also be signed by his or her legal representative. Standardised forms can be obtained from the Apprenticeship Offices. The apprenticeship contract must include the name of the apprenticeship in which training is conducted, the apprenticeship period, the beginning and end of training, details regarding the people authorised to train apprentices and, if applicable, the IVET trainer, details related to the apprentice, a note concerning compulsory attendance of part-time vocational school, any periods of training held within the framework of a training alliance with other companies or educational institutions, the amount of the apprenticeship remuneration and the day on which the apprenticeship contract is concluded.

School-based part

The *School Organisation Act* (*Schulorganisationsgesetz*, SchOG, BGBl. no. 242/1962 as amended) regulates the responsibilities and structures of all school types (among others, the part-time vocational schools for apprentices) within the sphere of competence of the Federal Ministry of Education and Women's Affairs (BMBF). Its content includes the following items: the structure of the Austrian school system; general accessibility and exemption from tuition fees at public schools; the structure of curricula; provisions related to school pilot projects and special provisions concerning school organisation (individual school types and their tasks; organisation forms; admission prerequisites, curricula and training times; qualifications; number of schoolchildren per class; teachers and principals/head teachers).

Another important act is the so-called School Instruction Act (Schulunterrichtsgesetz, SchUG, BGBl. no. 472/1986 as amended), which regulates instruction and teaching at the schools to which the SchOG applies. It comprises provisions about the following areas, for example: admission, assessment of schoolchildren, repetition of school grades, cooperation of teaching staff, schoolchildren and legal guardians, etc.

Apart from these two important framework laws, curricula represent major parts of the legal framework. They are regulations issued by BMBF on the basis of the SchOG. All curricula provide for special focuses that can be selected autonomously by schools. This not only enables schools to define special focuses within a given framework but also to develop their own school profiles.

Source:

https://www.google.com/search?q=governance+apprenticeship+austria&ie=utf-8&oe=utf-8&client=firefox-b

Information by AVL:

Additional training

AVL focusses on the principles of a highly practice-focused training, combined with communication of theoretical subject knowledge and social skills. Beside the training in the company and vocational schools, AVL provides comprehensive additional trainings in different areas/skills. For the apprenticeship training in AVL, these courses are divided into seven different skills which are the following:

1. AVL Basics
2. Communication
3. Self-Management/Teamwork
4. English
5. Quality, Environment, Security and Safety (QES)
6. IT/Computing
7. Finance and Controlling

Depending on the apprenticeship trade, the courses and/or the frequency of the courses differ over the three to four years of apprenticeship training. The courses are based on the AVL Skill Management System, which is used for all employees. For a knowledge based company as AVL the management of skills is of vital interest as the skills of our employees are a key factor for AVL to stay ahead of our competition in our ability to serve our customers with the best solutions they require. This principle does not only apply for permanent employees, but also to each and everyone of the many apprentices in AVL.

For an exemplary, more detailed and visualized distribution of the additional training courses for an apprentice see figure 1.

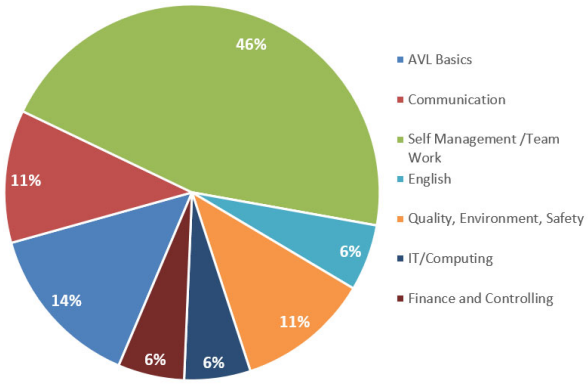


Figure 1.: Exemplary distribution of additional apprentice training courses apprentices from 1st to 3rd year of apprenticeship training at AVL.

For an even more detailed description of some of the many different courses which are provided by AVL for their apprentices, see table 1.

AVL – Skill	Course	Description
AVL Basics	Basics Tools & Processes in AVL	EBP, SAP, SRM Portal, AVL-Self Service
Communication	Telephone training Business Communication	Elements of communication, self-organization, interviewing and proper behaviour towards colleagues, supervisors and customers on the phone. Writing and phrasing of business letters/E-Mails as well as DO's and DON'T's in expression.
Self-Management / Teamwork	Time and Self-Management I & II	Time management, detection of distractions and solution approaches, relaxation techniques to improve performance, recognition of "time thieves" and solution approaches, biological barometer, learning techniques and how to use them effectively and efficiently.
English	English Course for Office, Operation Logistics, IT English Course for Commercial / Technical Trades	Communication skills in English (telephone, office vocabulary, E-Mail correspondence, everyday English, repetition of the basic grammar rules) Communication Skills with the following main topics: the apprenticeship workshop and its tools, writing your own CV, presentation of a topic of your choice
Quality, Environment Safety	Safety Training Global Quality and Environmental Management AVL	Compulsory instruction of the AVL occupational safety officers. How does quality management, environmental management and (occupational) safety help/support me in my daily work in the AVL?
IT / Computing	Webbased Training MS Outlook Basics Webbased Training MS Office Advanced	Working with MS Outlook and Web Access - Mail, diaries, contacts and e-mail etiquette. Advanced MS-Office Skills
Finance and Controlling	Business Administration Basics Business Game (Business Administration)	The basic functional areas and the environment of a company are developed as well as the components of success (on an economic level) are developed. Business simulation game for the practical acquisition and promotion of business knowledge.

Specialized Skill	SPS Basics	Introduction to automation technology, design of a PLC (programmable logic controller), overview of the safety of machines according to EN1050, programming of a PLC according to IEC 1131, various practical exercises.

Table 1.: Exemplary detailed description of additional AVL training courses for apprentices

Each new apprentice in AVL is also provided an introductory week which helps getting to know the company, the trainers and other apprentices. For an exemplary visualization of the introductory week schedule, see figure 2.

Apprentice Newcomer Week ET, KO, MBT, ZT

Time	Monday, 1.10.2018	Tuesday, 2.10.2018	Wednesday, 3.10.2018	Thursday, 4.10.2018	Friday, 5.10.2018	Time
07:30	Registration & Welcome Bag	AVL apprenticeship training	AVL Academy		Apprenticeship workshop	07:30
08:00	Company presentation and welcome by the apprenticeship trainers		Welcome by the personal management	English placement test		08:00
08:30		Rights and obligations for apprentices	Introduction AVL development & training / training programme for apprentices			08:30
09:00				Summary of the first week + reflection / presentation: My expectations concerning the apprenticeship		09:00
09:30	Break	Break				09:30
10:00	(Annual) Safety Instruction	Training documentation	Break	Way back to the apprenticeship workshop		10:00
10:30		Apprenticeship with higher school certificate	Apprentice health & fitness programme	Apprenticeship workshop		10:30
11:00	Tour/Orientation of the company area at Hans List-Platz, Schrödiger, Wienerstr., Marieng.		Presentation Work Council + JVR			11:00
11:30		Lunch at the canteen "Bilderland"	Lunch			11:30
12:00	Lunch with the apprenticeship trainers	Apprenticeship workshop				12:00
12:30			Way back to the apprenticeship workshop			12:30
13:00	Safety instruction for technical apprentices		Apprenticeship workshop			13:00
13:30						13:30
14:00	"Introduction apprenticeship workshop"					14:00
14:30						14:30
15:00	Introduction and allocation of workspaces, lockers, working clothes, etc., respectively start of apprenticeship training					15:00
15:30						15:30
16:00						16:00
16:30						16:30

Figure 2.: Exemplary schedule of the "apprentice newcomer week" for technical trades at AVL.

AVL also provides the possibility for the apprentices to obtain a higher school certificate ("Matura") in combination with the apprenticeship training.

How does it work?

- There are four examination subjects:
  - German
  - Mathematics
  - a modern language (English)
  - specialist subject
- The courses are held at AVL, in part during working hours (Friday from 12:00 p.m. to 4:00 p.m. and/or Monday from 3:00 p.m. to 7:00 p.m.)
- German & English are provided for by AVL directly, the other two additional subjects have to be attended in evening and/or weekend.

- There is no extension of the apprenticeship if the courses are attended during working hours

The preconditions are the following:

- The basic precondition is a valid apprenticeship contract
- It is possible to take part in the "apprenticeship with higher school certificate" scheme from the first year of the apprenticeship
- Three of the four examinations can be taken before the final apprenticeship exam, the fourth after this exam and after reaching the age of 19
- At least one of the four examinations must be taken during the apprenticeship or by the time of the apprenticeship exam, and the other three years after this exam at the latest.

For further information, see https://www.avl.com/lehre-mit-matura.

AVL also provides the possibility to attend a presentation competition, which is held by the "Land Steiermark" (province of Styria) each year. If the apprentices choose to be part of this competition, the preparation course (four days) and the competition itself will be held during normal working hours. For further information, see http://www.jugendreferat.steiermark.at/cms/beitrag/12641349/598018/_1.

Certification and accreditation

The final apprenticeship examination, the "Lehrabschlussprüfung" (LAP) completes the apprenticeship training for each apprenticeship trade. The LAP differs for each apprenticeship trade, but basically consists of two parts: A written or practical examination and an oral examination.

Each apprentice can take a preparation course for the LAP if required. The Federal Chamber of Economy Austria (WKÖ) finances up to 250 € of the preparation course. If the preparation course costs exceed 250€, AVL will pay for the rest of the course, thus the course is practically free of charge for the apprentice.

For additional help for the apprentices to successfully finish their apprenticeship, AVL provides the following options:

- Additional tutoring courses
- Additional coaching

- AVL certificates (attended courses)
- Verification of learning success (throughout the apprenticeship)

Quality Assurance in dual VET education in Austria

Who is responsible to ensure qualitative training within the apprenticeship system for training in the company as well as in school. And how does it work?

Various public bodies at national and regional level in the areas economics and education are responsible to ensure and to strengthen qualitative thaining within the apprenticeship system in companies as well and in school.

At national level the Federal MinistryRepublic of Austria for Digital and Economic affairs is responsible für the occupational profiles of apprenticeship occupations. The development of these occupational profiles is carried out together with the representative bodies of the concerned professions. The decision is made on recommendation of the body **Federal Advisory Board on Apprenticeship** (BBAB), which is composed of all concerned institutions, Ministries, Social partners etc.

The responsibility for curricula in part-time VET school is at the Austrian Federal Ministry of Education, Science and Research.

Economic Chambers at provincial level are responsible for accreditation of companies who are allowed to educate and train apprentices, in accoedance with the Chambers of labour. The "Lehrlingsstellen" are Federal administrative offices, located in the Provincial Economic Chambers, the are responsible for check and control of companies who educate and train apprentices.

Part-time VET Schools are controlled by school inspectors. A programm QIBB – Quality in VET – set up by the Austrian Federal Ministry of Education, Science and Research, supports inspectors, headmasters and schools to ensure and to strengthen quality of education and training at schooland in school development.

The final exam "Lehrabschlussprüfung" is divided into two parts, practical concerning the occupational profil trained in companies and theoretical concerning the curriculum in school. Responsibility for school exam in principle is at school, for the practical part the concerned professional body within the Economic Chamber ist responsible for.

A detailed description of that and more quality ensurance and management features concerning apprenticeship training in Austria can be found in the

Source:

https://www.wko.at/service/bildung-lehre/Qualitaet_Lehre.pdf

In a formal sense the systems and processes of quality ensurance seems to work quite well. The legal based education and training procedures in companies and schools are well administrated and controlled.

But, in daily reality some qualitative challenges are given, at the company level, in different occupational areas, also in differences in regions and branches.

Some of these challenges are not caused by the apprentice system itself, but are effects of educational systemic features in general, e.g. by the basic educational performance of some applicants for apprenticeship.

In some branches the rate of drop-outs during the apprenticeship rather high, also the failing rate in final exam.

The increasing number of apprentices with a different first language than German could be a challenge, at least in the future.

A main challenge is to motivate a increasing number of qualified young people for STEM VET occupations, also regarding the gender aspect, to motivate female people for STEM occupations.

Pathway into apprenticeships in Austria

Who is allowed and able to be an apprentice? How can he / she get into to system and to be trained as an apprentice? Are there barriers for access? Etc…

The only formal barrier for access into apprenticeship is the completion of compulsory school, nine school years, normally in the age of 15, independent of the school level and grades or marks.

The mainprediction for access into apprenticeship is an agreement between a company and the applicant, including the acceptance by parents in the case the applicant is less than 18 years old.

In practice barriers could be a lack of offered apprenticeship places, less educational performance of the applicant, personal impressions during the recruiting process concerning

interest and willingness of the applicant or deficits in behaviour in relation to the needs and demands in the working world.

In high qualified STEM occupation apprenticeship areas the lack of interest and/or educational permormance may be the most important barriers to become an apprentice in these areas.

Source:

https://www.dieindustrie.at/aktuelles/2017/bildungsanforderungen-an-berufseinsteigerinnen/

Information, Advice and Guidance

AVL also tries to provide different platforms where young students can get information about the apprenticeship training in AVL. Here are some examples:

- AVL employees visit different schools in the province Styria to inform students personally about the apprenticeship training in AVL.
- AVL also participates in the "Girl's Day", which is financed by the province of Styria and provided by STVG. For more information see http://girlsday.berufsorientierung.at/.
- During open house day, the children of AVL employees can visit the AVL apprenticeship workshop and inform themselves about the different possibilities AVL provides for their apprentices.
- Open MINT – AVL is one of the partner companies of "Open MINT" and aims to attract more girls and young women for MINT professions. In AVL, apprentices have the possibility to become MINT "messengers". After specific training by "Open MINT", the apprentices can present their apprenticeship trade and AVL at schools and inform the students about the possibilities in AVL. For more information see: http://mint-steiermark.at/blog/warum-open-mint.
- Your-Job – Piezocryst (AVL List GmbH) is also one of the partner companies for "your-job". For more information see http://www.your-job.at/.

Further information concerning Information, Advice and Guidance in Austria

Can be found e.g. in

https://www.apprenticeship-toolbox.eu/programmes-pathways

3.2. Germany

3.2.1. Legal base – regulatory framework

Economic Context

Although the German economy was affected by the global financial crisis, it is in a solid state seven years later. The shift from an industrial to a service economy is continuing. Small and medium enterprises prevail and play a crucial role in providing training.

Germany has 81.8 million inhabitants (2015), of which in 2015, 43.03 million were in employment. The numbers have been growing since 2006. Reasons for the growth are migration and mobilisation of the hidden reserve, especially the increase of employment among women. Despite the growth of the labour force the demographic change remains a challenge. The declining numbers of school leavers for demographic reasons as well as growing interest for higher education have an impact on the amount of newly signed training contracts in the dual apprenticeship system. Moreover, the effects of the current inflow of refugees cannot be anticipated yet.

According to EUROSTAT the overall unemployment rate in 2015 was 4.6%; and the youth unemployment rate was/amounted to 7.2%. In the same year, 56.4% of the population aged 25-64 had an upper secondary qualification (ISCED 3-4) and 23.8% held a tertiary level qualification (ISCED 5-8).

The German economy is largely characterised by small and medium-sized enterprises (SMEs). Of the 3.6 million companies in 2012, 99.3% were SMEs. They include the majority of the 583,668 craft enterprises. More than 60% of the workforce in Germany is employed in SMEs. SMEs play also a crucial role in providing training to apprentices in the dual apprenticeship system.

In the last decades Germany has undergone a substantial shift from an industrial to a service economy and the manufacturing sector has become more service intensive. The service sector is the largest economic sector and generated 68.6% of the GVA (gross value added) in 2014, whereas the industry/manufacturing sector accounted for 30.7% and the agriculture/forestry sector for only 0.8%. This is also mirrored in the employment statistics. Three out of four persons were employed in the service sector in 2012, and the number of employed persons in agriculture/forestry has halved since 1991 (Statistisches Jahrbuch 2015).

There are strong regional disparities in the German economy. Very roughly said there is a North-South and an East-West divide. East Germany still has a much lower labour productivity and less industrial companies, although there are also less prosperous regions in West Germany. Some regions and branches are already affected by skills shortage. It is expected, that especially SMEs encounter increasing difficulties to recruit skilled personnel. This is already mirrored in growing difficulties of enterprises to fill their training places.

Sources and further reading:

- Federal Statistical Office of Germany Destatis: www.destatis.de (available in English)
- EUROSTAT: http://ec.europa.eu/eurostat/data/database

3.2.2. Apprenticeship System

In Germany many young people enter the labour market over the apprenticeship system. Over 500,000 new apprenticeship contracts are concluded every year. The system developed historically out of the medieval guild system. Its base is the concept of "occupation".

Competences

The Federal Republic of Germany consists of 16 states [Länder]. They are responsible for legislation and administration in the areas of education, science and culture. The distribution of legislative competence between the Federal Government and the Länder is defined in the Basic Law, in that the Länder shall have the right to legislate insofar as the Basic Law does not confer legislative power on the Federal Government (Article 70). Educational and cultural legislation is therefore primarily the responsibility of the Länder.

The regulation of the in-company part of the dual apprenticeship training is the only direct competence area of the federal government within the field of education. Because of the importance of apprenticeships for the economy the German government puts a high emphasis on the promotion of the system. It addresses the challenges through initiatives and programmes. The core of the dual apprenticeship system is the institutionalized cooperation of the federal government, the federal states and the social partners based on a principle of **consensus**. The offer of in-company training places is the decision of the company and subject to **market conditions**.

History

Historical roots of the in-company training go back to the Middle Ages. Individual craft and trade associations, the guilds, regulated apprenticeships for their enterprises. A systematic form of training in enterprise and school, the so-called master craftsmen training, developed out of those occupational regulations. As the process of industrialization began, the industries adopted the concept of craft training and adapted it to their needs. They regulated vocational training through the establishment of a mandatory catalogue of skills and knowledge and guidelines for the duration of the training.

Gradually, "national standards" were created for the qualification of skilled workers. But it was not until after the Second World War, in 1953, that vocational training in the crafts was regulated under the Crafts and Trade Code (Gesetz zur Ordnung des Handwerks –HwO). In 1969 the Vocational Training Act (BBiG) was adopted and amended in 2005.

Vocational schools also look back on a long tradition that can be traced back to the 16th and 17th centuries. Although compulsory vocational school instruction was not introduced until 1938, the public authorities could already oblige enterprises to send their apprentices to vocational school more than a hundred years ago.

Meaning of apprenticeship

In Germany apprenticeship in the dual system is (still) the main pathway into employment for young people. Depending on the occupation it is also a widely accepted option for young people with university entrance qualification. Many companies consider training as a social task and take pride in being a training company. The relatively smooth transition into employment and the resulting low youth unemployment are seen as important strengths of the system.

In the recent years the system started to get under pressure due to the trend towards academic studies. Traditionally youth entering the dual apprenticeship system outnumbered higher education entrants. In 2011 the numbers were even for the first time, and since then higher education enrolments dominate.

Core concept

The foundation of the system is the **occupational concept**. Apprentices are trained in a recognized training occupation according to nationally valid standards. The overall aim is to

equip the individual with abilities, knowledge and skills – referred to as **professional ability to act** – necessary for the exercise of a qualified vocational activity in a changing working environment. This way the interests of the apprentices to gain a labour-market relevant qualification and of the companies to get a skilled labour force are intended to be balanced. The occupation also serves as resource for social integration and personal identification.

Numbers

In 2012 the calculated share of the resident population starting an apprenticeship in the dual system was 53.4%. In total 1,358,550 persons were in an apprenticeship in 2014. From the apprentices starting in 2014, 42.8% had a general secondary education leaving certificate, 28.1% a secondary education leaving certificate and 26.2% were holding a university entrance qualification.

The number of newly-concluded apprenticeship contracts was 522,094 in the training year 2014/15. Over one third of the contracts were concluded in the ten most frequent training occupations.

There were 1,552 part-time vocational schools in 2015. At the end of the year 2014, 431,121 companies participated in the apprenticeship system, a that is 20.3% of all companies in Germany. In 2012, two thirds of the apprenticeship graduates were taken on as employees, at very small companies half the graduates were taken on. The ratio also varies according to the sector.

Links and Materials:

- BIBB 2015: VET data report Germany 2014. http://www.bibb.de/veroeffentlichungen/de/publication/download/id/7722 [15.10.2015]
- Federal Statistical Office of Germany Destatis: www.destatis.de (available in English)
- BIBB 2015: Training regulations and how they come about (Source history)

Governance

In Germany the federal states are responsible for the field of education. In initial vocational education young people have the choice between apprenticeships and fulltime vocational schools. For graduates both systems offer pathways for professional advancement.

Compulsory education and certificates

Due to the cultural sovereignty the education systems of the federal states differ slightly. Full time school attendance in Germany is compulsory for ten years starting at age 5 or 6, depending on the state. Pupils that are not continuing full time general or vocational school after those ten years are subject to the compulsory part time vocational school attendance until they turn 18 or for the duration of their apprenticeship in the dual system. After 4 or 6 years in primary education (depending on the federal state) pupils continue in different educational tracks (secondary general school, intermediate general school, grammar school or a comprehensive school combining the other types). Depending on the school type they can achieve five different leaving certificates:

- the general secondary education leaving certificate after Grade 9,
- the secondary education leaving certificate after Grade 10,
- the school part of the university of applied sciences entrance qualification (Fachhochschulreife) after Grade 11,
- subject-restricted university entrance qualification (Fachgebundene Hochschulreife)
- the university entrance qualification (Abitur) after Grade 12 respectively 13.

Initial VET

When choosing initial VET, graduates with the secondary education leaving certificate can enter full-time vocational schools leading to a state certified occupation, general education programmes with vocational orientation or dual apprenticeship programmes.

The dual apprenticeship system dominates in terms of number of learners the German VET system and leads to recognized training occupations. Apprenticeship is open to anyone having finished compulsory education and having a contract with a training company. Pre-vocational training measures are available for young people that did not succeed in finding a training company to start an apprenticeship or are in need of upgrading their knowledge and competences.

The full-time vocational school system encompasses the VET programmes outside the dual apprenticeship system, which are regulated by other federal or federal state laws. Those are for example occupations in the health and the social sector or the so-called assistant occupations. Many occupations in the health sector also encompass two learning venues,

e.g. a hospital and the vocational school. Another option is programmes that combine general upper secondary and vocationally oriented education, usually leading to a university entrance qualification.

Formal continuing vocational education and training (CVET)

CVET in Germany is characterised by a broad range of offers and functions as an open market. For VET graduates nationally regulated further training qualifications are available, e.g. the "Meister" (EQF 6) and qualifications issued by the chambers. Both are based on the Vocational Training Act and the Crafts and Trade Code. The qualifications are mostly mapped on EQF-levels 5-7.

The trade and technical schools of the federal states also offer state recognized VET qualifications at a higher level, e.g. to become a technician (EQF 6). Most further training qualifications and certificates of trade and technical schools enable access to university.

Tertiary system

German universities and universities of applied sciences offer bachelor and master programmes. The dual university, vocational academies and universities of applied sciences also run dual study programmes that combine learning at the higher education institution and the company.

German Qualifications Framework

The German Qualifications Framework for Lifelong Learning (GQF) was developed involving the relevant stakeholders and adopted in 2013. The GQF has eight levels to which formal qualifications from general education, higher education and vocational education are assigned. The concept of action competence is at the centre of the GQF. In the vocational sphere it is equated with vocational capacity as defined in the Vocational Training Act.

The two-year occupations of the dual system are assigned to level 3, the three-year and three-and-a-half-year occupations to level 4. Advanced training occupations in the CVET sector are assigned up to level 7. In 2017 the assignments will be reconsidered, taking into account the hitherto unassigned general education diplomas.

Source: Cedefop 2014. Spotlight on VET Germany. Greece: Publications Office; available at: http://www.cedefop.europa.eu/en/publications-and-resources/publications/8057

Further reading:

- BIBB 2017: Germany. VET in Europe – Country report 2016. http://www.refernet.de/images_layout/bibb_refernet_2017_onlineversion_1_barrierefrei.pdf [08.06.2017]
- Arbeitskreis Deutscher Qualifikationsrahmen 2011: Der Deutsche Qualifikationsrahmen für lebenslanges Lernen. http://www.dqr.de/media/content/Der_Deutsche_Qualifikationsrahmen_fue_lebenslanges_Lernen.pdf [15.10.2015]
- Bundesministerium für Bildung und Forschung / Kultusministerkonferenz 2013: German EQF Referencing Report. http://www.dqr.de/media/content/German_EQF_Referencing_Report.pdf [15.10.2015]

Last Updated: 08 June 2017

See also: https://www.apprenticeship-toolbox.eu/germany

Alignment to labour market need

How works the adjustment of apprenticeship occupational profiles in companies and curricula in schools and training with developing and changing labour needs and demands of labour market and professions?

We have to fulfill two aspects in Germany. There are the training regulations, which are defined in official documents from the BIBB (Bundesinstitut für berufliche Bildung) which define two frameworks. One for the company (practically) and one for the school (theoretically). This two curricula are defined in open definitions what is to do. As an example for the Electrician:

https://www.bibb.de/tools/berufesuche/index.php/regulation/industrielle_elektroberufe_2007.pdf **English translation see Appendix 4.**

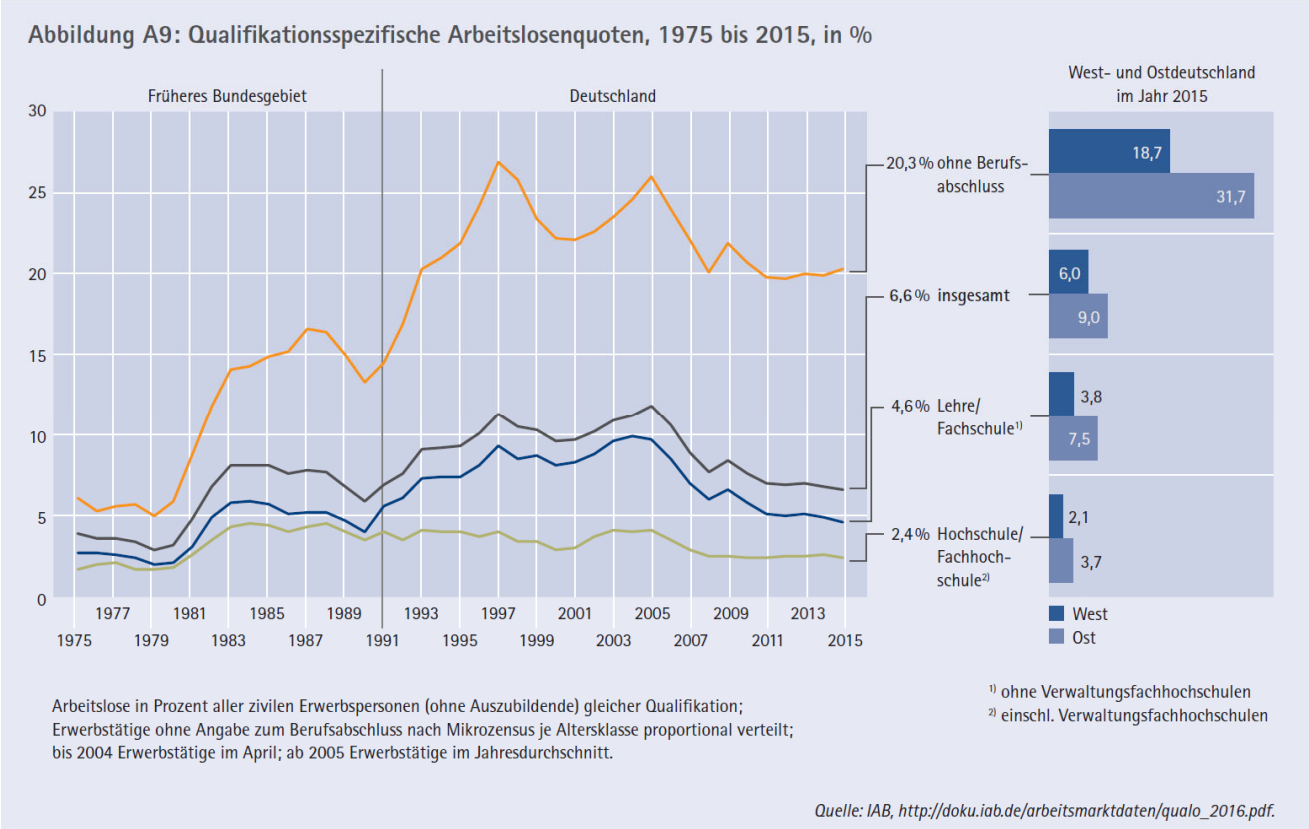
There are defined common qualifications like organization and safety in the company. (See paragraph – vocational position) 2 and 3 in the above linked document.

Then we have as an example at Page 1706 the Factual structure of the professional qualifications which are to learn in the company. As an example number 12 on page 1706 which describe the technical analysis in general words which can be in practice different.

For detailed information we have translated the whole official document. See Appendix 4.

Data of actual labour market

Unemployment rate related to qualification level



Unemployment rate without any occupation graduation 21% in 2015. With vocational education (school and or company) 4.6%. With academic graduation 2,4%.

Tabelle D4: Erwerbslosenquoten Jugendlicher in Europa, 2013 bis 2015, in %

Region	2008	2013	2015
EU-28	15,6	23,6	20,4
Belgien	18,0	23,7	22,1
Bulgarien	12,7	28,4	21,6
Dänemark	8,0	13,1	10,8
Deutschland	10,6	7,8	7,2
Estland	12,0	18,7	13,1
Finnland	16,5	19,9	22,4
Frankreich	18,3	24,0	24,7
Griechenland	21,9	58,3	49,8
Irland	13,3	26,8	20,9
Italien	21,2	40,0	40,3
Kroatien	23,7	50,0	43,0
Lettland	13,6	23,2	16,3
Litauen	13,3	21,9	16,3
Luxemburg	17,9	15,5	17,3
Malta	11,7	13,0	11,8
Niederlande	5,3	13,2	11,3
Österreich	8,5	9,7	10,6
Polen	17,3	27,3	20,8
Portugal	16,7	38,1	32,0
Rumänien	18,6	23,7	21,7
Schweden	20,2	23,5	20,4
Slowakei	19,0	33,7	26,5
Slowenien	10,4	21,6	16,3
Spanien	24,5	55,5	48,3
Tschechische Republik	9,9	19,0	12,6
Ungarn	19,5	26,6	17,3
Großbritannien	15,0	20,7	14,6
Zypern	9,0	38,9	32,8

Quelle: EU-Labour Force Statistics, eigene Berechnungen.

Unemployment rate in the age up to 25 in the European comparison. The lowest rates are in Germany and Austria. (Reference IAB Arbeitsmarkt kompakt 2017)

For detailed comparison look also

https://www.eca.europa.eu/Lists/ECADocuments/SR17_5/SR_YOUTH_GUARANTEE_DE.pdf

One of the favorite books which describe in detail all aspects is:
https://www.rudolfstrahm.ch/bucher/

proportion of apprenticeship qualification in the workforce

Complete overview: https://www.bmbf.de/pub/Berufsbildungsbericht_2017.pdf

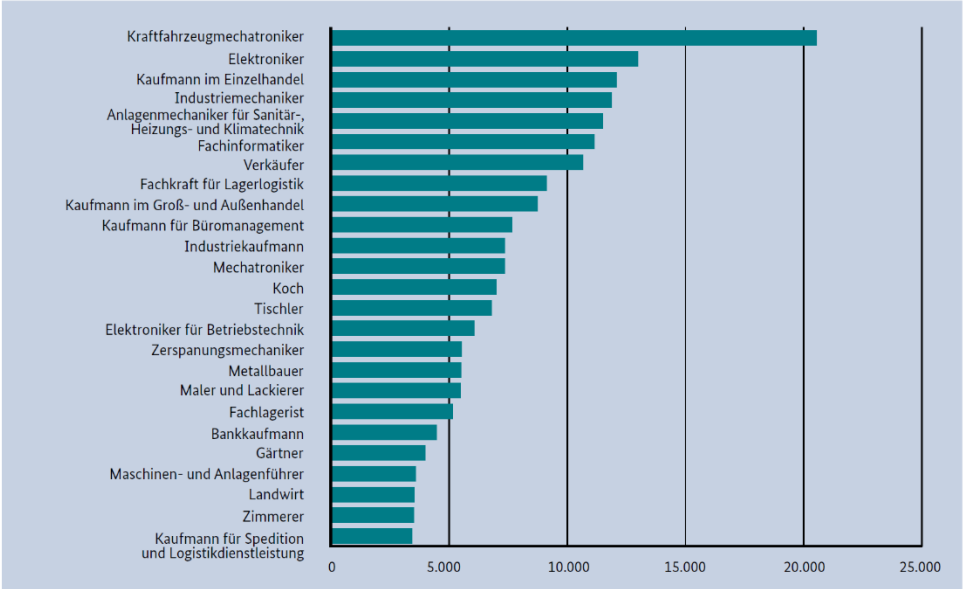
English version see WIKI: https://wiki.soluvia.de/confluence/display/EAT/IO1+-+German+Apprenticeship+Comparison+Study

From all companies in Germany 44% offer vocational education. 96% of the big companies offer vocational education (last report 2012).
https://www.bibb.de/datenreport/de/2014/19520.php

Top 10 of highest numbers of apprenticeship professions

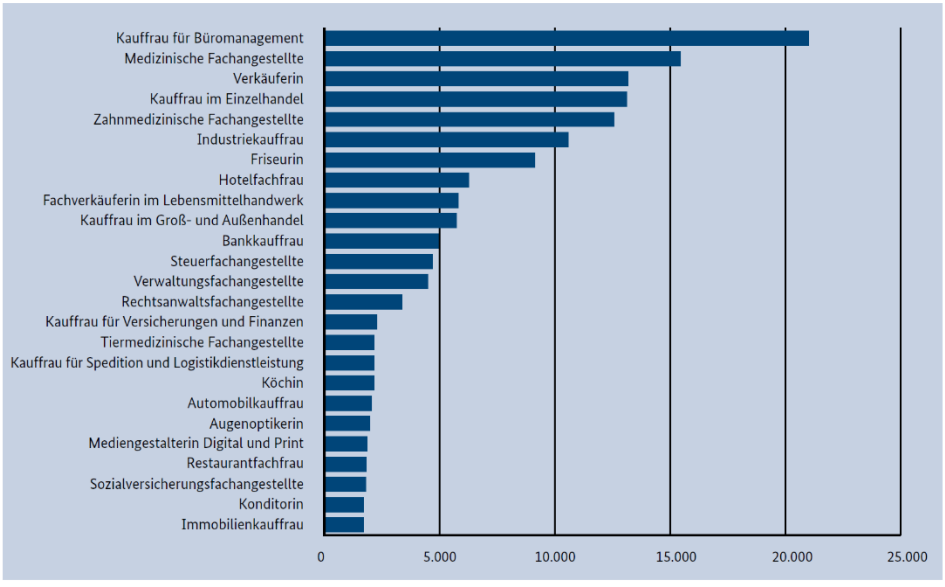
Source Berufsbildungsbericht 2017:

Schaubild 6: Die 25 im Jahr 2016 am häufigsten von jungen Männern besetzten Berufe



Quelle: BIBB, Erhebung zum 30. September 2016

Schaubild 5: Die 25 im Jahr 2016 am häufigsten von jungen Frauen besetzten Berufe



Quelle: BIBB, Erhebung zum 30. September 2016

In the comparison between men and woman we can analyse, that for the MINT area no women works in the top 10 professions while the men have 4 of 10 professions in the MINT area.

Demand of labour market

Employment rate MINT: https://statistik.arbeitsagentur.de/Statischer-Content/Arbeitsmarktberichte/Berufe/generische-Publikationen/Broschuere-MINT.pdf

See also chapter which describes MINT (STEM)

Employment rate Germany 2017: https://www.destatis.de/DE/Publikationen/StatistischesJahrbuch/Arbeitsmarkt.pdf?__blob=publicationFile

Arbeitsmarkt kompakt IAB: https://www.wbv.de/openaccess/themenbereiche/bildungs-und-sozialforschung/shop/detail/name/_/0/1/300936w/facet/300936w/////nb/0/category/1142.html

For detailed MINT analysis see:

https://www.gesamtmetall.de/sites/default/files/downloads/mint-herbstreport_2017_final.pdf

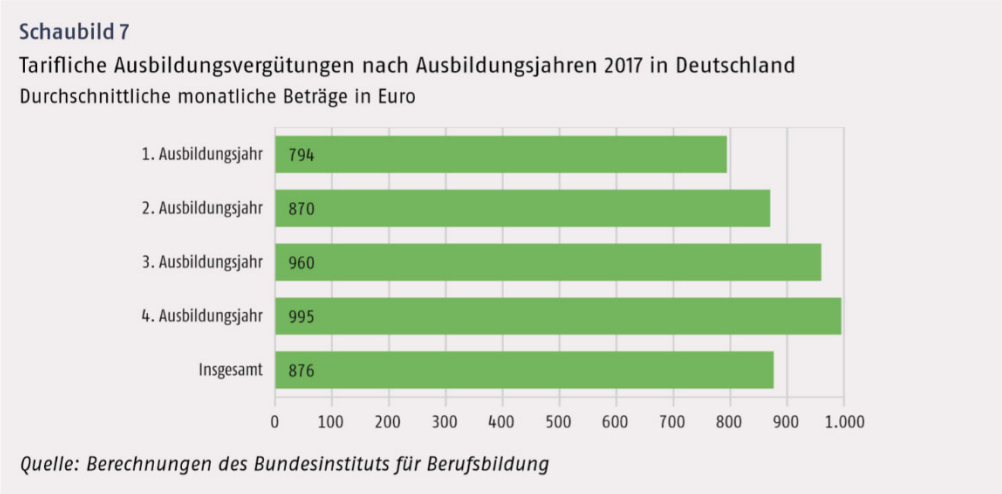
More studies from the institute IW: https://www.iwkoeln.de/studien/gutachten/beitrag/christina-anger-sarah-berger-oliver-koppel-axel-pluennecke-mint-herbstreport-2017-368955.html

See also chapter which describes MINT (STEM)

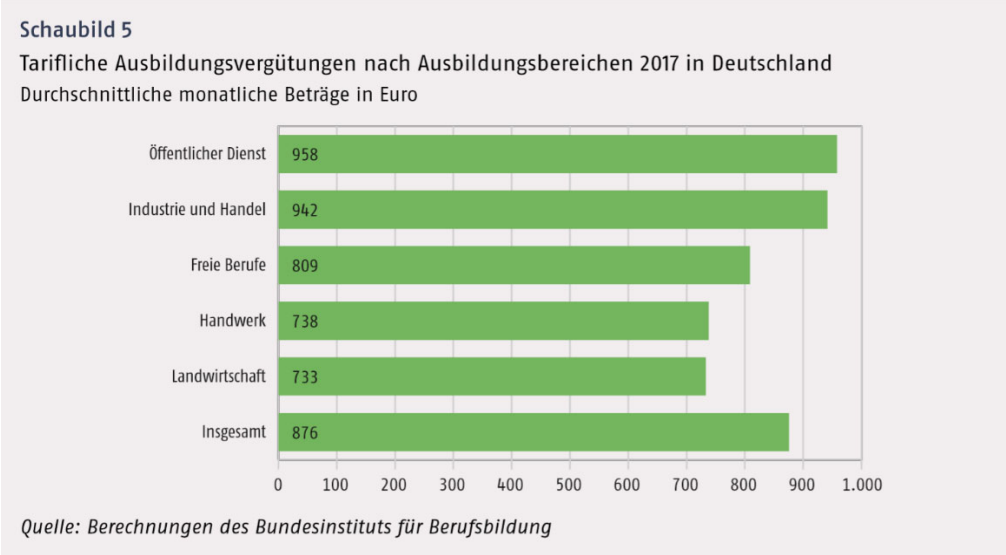
Financing of apprenticeship system

Apprenticeship compensation: https://www.bibb.de/dokumente/pdf/fbi-22_barrierefrei.pdf

Average apprenticeship compensation of the three to four years training.



For sectors:



Normally the company pays full the compensation for apprenticeships. The company and the student has not to pay any money for the vocational school. This is paid by the federal states.

If a company employs a social disadvantaged persons they can become up to 50% of the compensation. This is done for approximately 10% of the apprenticeships in companies.

See: https://www.bibb.de/datenreport/de/2015/30871.php figure A 1.3-3 in 2014.

We have in Germany for the young people which cannot direct reach an apprenticeship, whyever a lot of other possibilities. Until they are not 18 years old they must go to school.

Nearly 50% of non employed young people below 18 years go to different schools. 10% will be integrated in pre- employment activities (Einstiegsqualifizierung EQ, Berufspraktisches Jahr BPJ).

This is financed by Bundesagentur für Arbeit below 18 and by the regional Jobcenters if they are over 18 years old.

See also chapter transition from school to company.

Share of company based training and in school based training

The type of schooling depends on the vocational school.

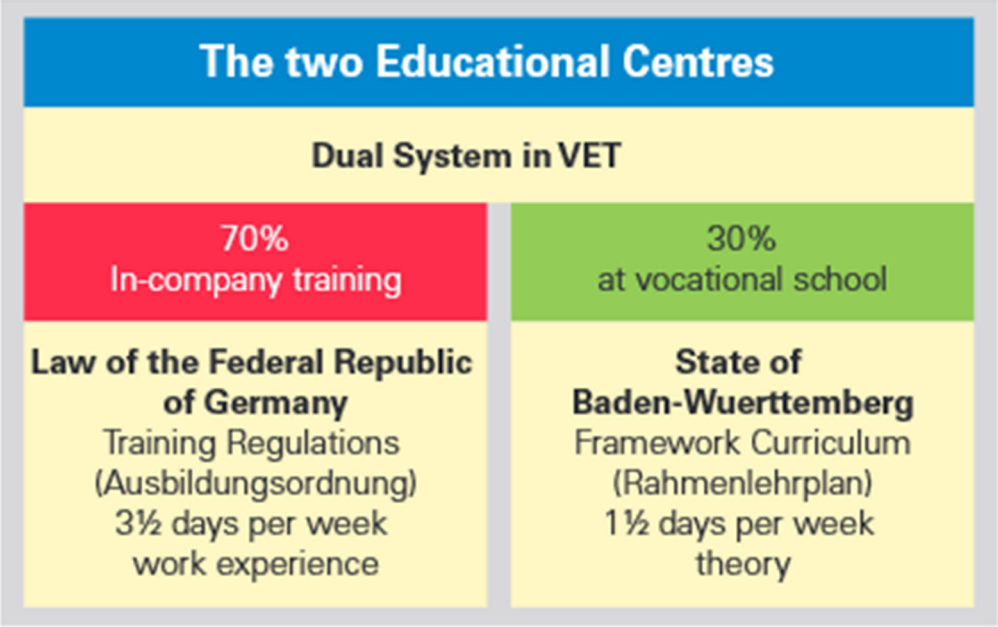
To illustrate this, various schooling plans are shown in **Appendix 11**.

To the explanation:

WvS and CBS use an ABC weekly plan. Here, the apprentices of the 1st year of apprenticeship in the C-week, those of the 2nd year of apprenticeship in the B-week and those of the 3rd year of apprenticeship in the A-week have school.

Instead, block lessons are held at the Max Hachenburg (Commercial vocational school) and Heinrich-Meidinger (Technical vocational school for plant mechanics) School.

However, as shown in the graph, schools must adhere to an average weekly training period of 30 percent (1.5 days).



Based on partnership: the two Educational Centres

Source: Vocational Schools Page 6 (Appendix 11)

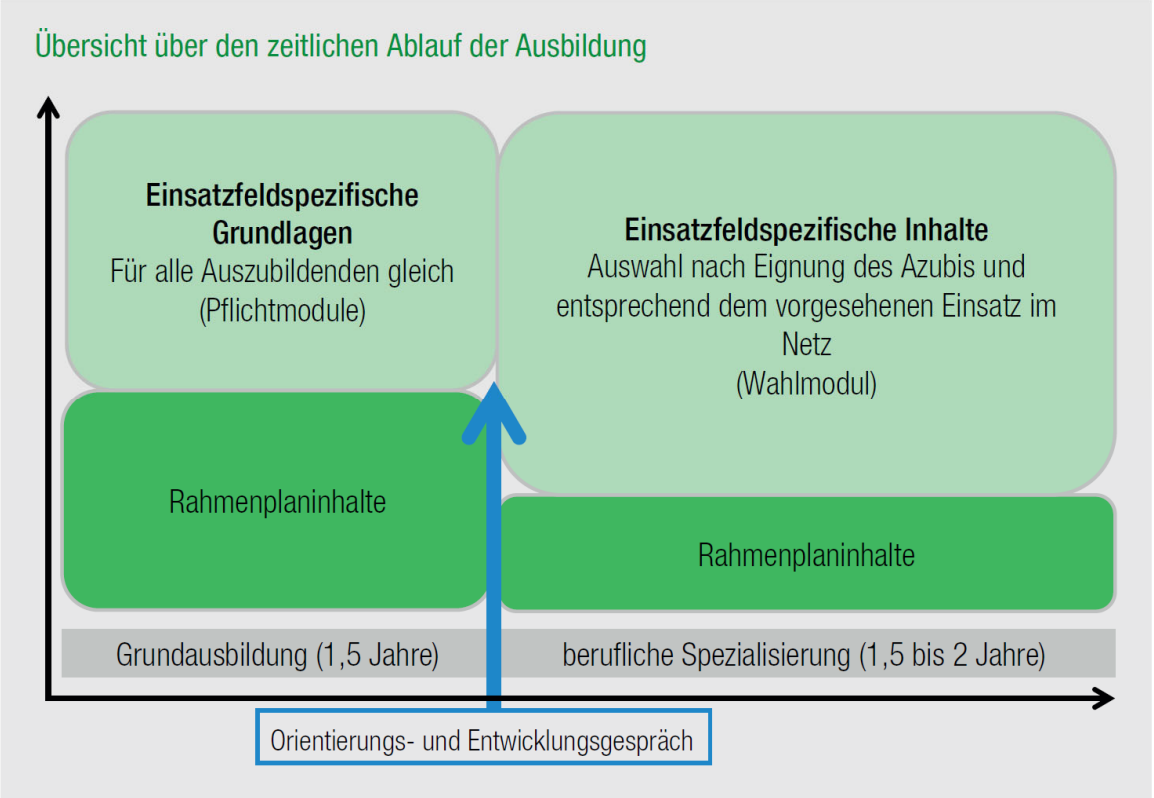
Furthermore, the following chart shows how to divide lessons into general, vocational and elective subjects.

CURRICULUM WITH INDIVIDUAL SUBJECTS OR VOCATIONAL COMPETENCIES*

Vocational School	Technical vocational school	Economic vocational school	Vocational school for home economics, nursing, social pedagogics	Agricultural vocational school
General subjects **4 lessons/week**	• German • Social Studies • job-related English (final implementation) • Religious Education			
Job-related subjects **8 hours/week**	**Economics or Economic Competence** **e.g. mechatronic with focus on** • component manufacture • analysis of information flow in complex mechatronic systems • start-up, trouble-shooting, and maintenance and repair	**e.g. industrial clerk with focus on** • business administration • monitoring and controlling • macroeconomics • data processing • project competence	**Economics** **e.g. professional housekeeper** job-related topics such as • dietetics and food science • hygiene • production tools • customer service • related maths • related drawing • practical job-related skills	**Economics** **e.g. farmer** job-related topics such as • food production • livestock breeding • agricultural machinery • business administration • related maths • practical job-related skills
Compulsory elective subjects **1 hour/week** special courses supplementary courses	e.g. supplementary German, Technical Mathematics e.g. special job-related topics, additional qualifications (for example, the Advanced Certificate of Vocational Education can be acquired at various vocational schools by students with a GCSE), or general subjects such as foreign languages			

* For new and restructured professions the curriculum is divided into learning competencies instead of individual subjects.

Source: Vocational Schools Page 9 (Appendix 11)



Source: EWP Bildungswelten 02/2017

Additional training

The additional offers of the vocational schools are school-dependent and therefore different. Here are two examples:

1. The vocational school offers students the opportunity to acquire the technical college entrance qualification in parallel with their training. This offer makes it possible to start studying directly after the apprenticeship. The additional training begins at the beginning of the training and ends after 3 years in a theoretical final examination. See flyer from WvS-School (Technical Vocational School Electronics Technician and Mechatronics Technician) in **Appendix 13** (only in German language)
2. Another offer of the vocational school for industrial mechanics is that an additional training as an electrician is offered for specified activities. This enables the trainees to carry out specified electrical engineering tasks after their training. The additional training begins six months after the start of the apprenticeship and ends after 2.5 years with a theoretical and practical IHK (Chamber of Commerce) examination.

In both cases, these are school offers. The school covers the costs. For schooling within the company's working hours, there is an exemption from participation in school lessons.

At MVV Energie, various additional services are offered parallel to the training. Here are some examples:

- Introductory week (for getting to know the company, the trainers and the other trainees)
- Health & Care: healthy nutrition (several daily treatments)
- Job & Money: Information on old-age provision, investment and capital-raising benefits (daily event)
- Trainee seminar in the 2nd year of apprenticeship: cultural development and strengthening of cohesion (4 days)
- Social week: to promote social skills (1 or 2 weeks)
- Talent group: to promote project management and team development (in the 2nd year of apprenticeship)

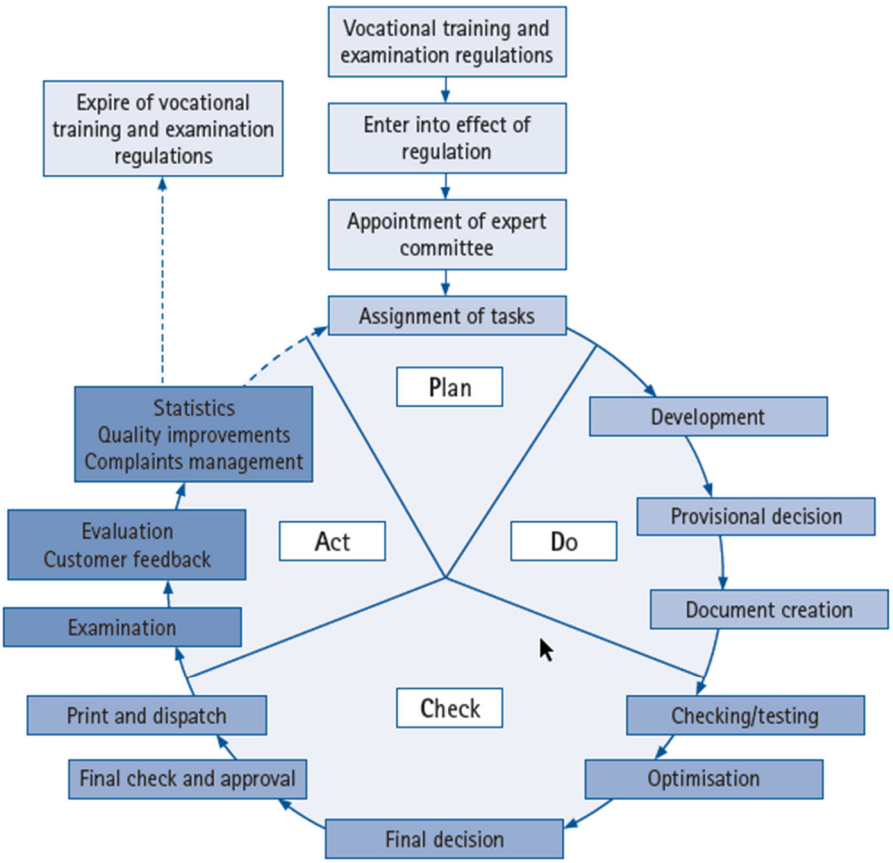
Many companies offer the same or similar additional services.

Certification and accreditation

For detailed information on the course of the final examination, see the following link: https://www.prueferportal.org/html/22.php

Here you will find all information from the examination board, from the preparation of the examination tasks to the execution of the examination.

In addition, **Appendix 14** contains a flyer of the PAL (Examination Task and Teaching Aid Development Agency) explaining the process of task creation. See also the following diagram:



PDCA cycle for the development of examination exercises in accordance with DIN EN ISO 9001:2008

Source: Flyer "PAL-Examination questions and training materials within the dual system for vocational training" (Appendix 14)

Quality Assurance

See appendix 7

Legal frameworks for vocational training in Germany and how they arise

Quality assurance can be divided into three parts:

Part 1:

Here, various cornerstones of quality assurance in in-company vocational training are described and explained. (see graphic attached)

Figure 1: 11 Cornerstones for quality assurance

Part 2:

Here, quality assurance in the dual system is examined in the context of the European Quality Assurance Framework (EQAVET).

The core component is the EQAVET – quality assurance cycle (see chart below)

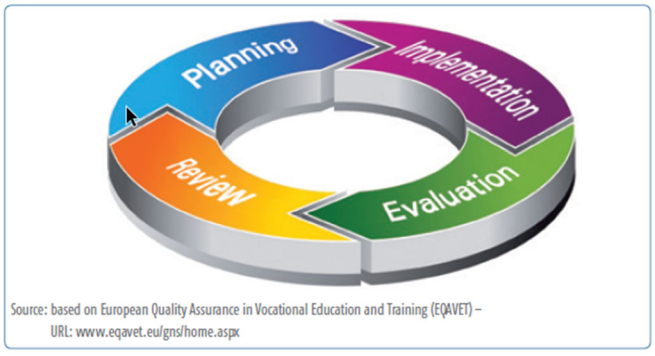


Figure 2: European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET – quality assurance cycle)

Part 3:

In this section, quality assurance in in-company vocational training is presented in a multi-level system of vocational education and training.

In this case, the

- system level
- the intermediate level
- company level

differentiated. (see graphic attached)

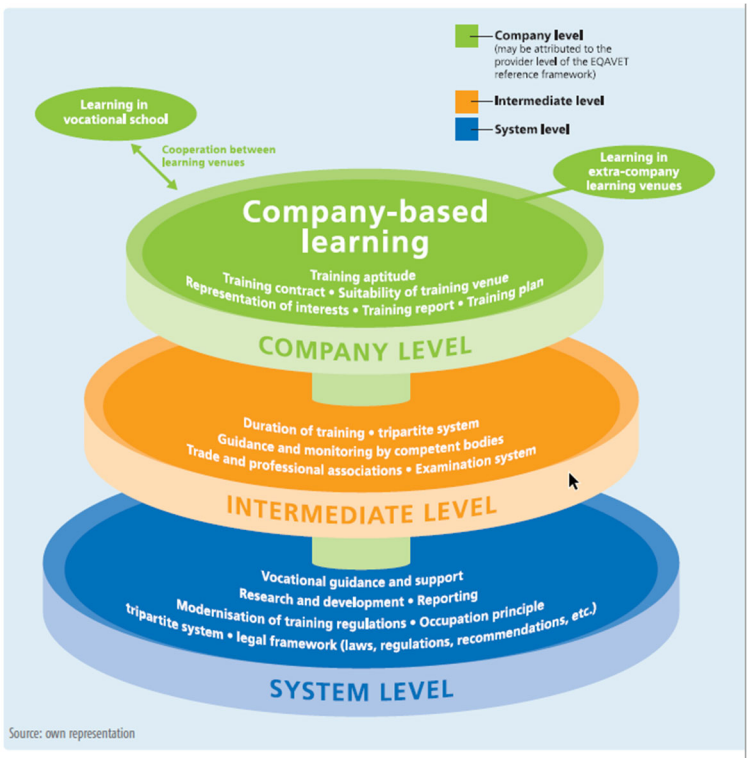


Figure 3: Quality assurance in company-based learning

For detailed information on the three parts see **Appendix 12** Document "Quality assurance of company-based training in the dual system in Germany".

Pathway into apprenticeships

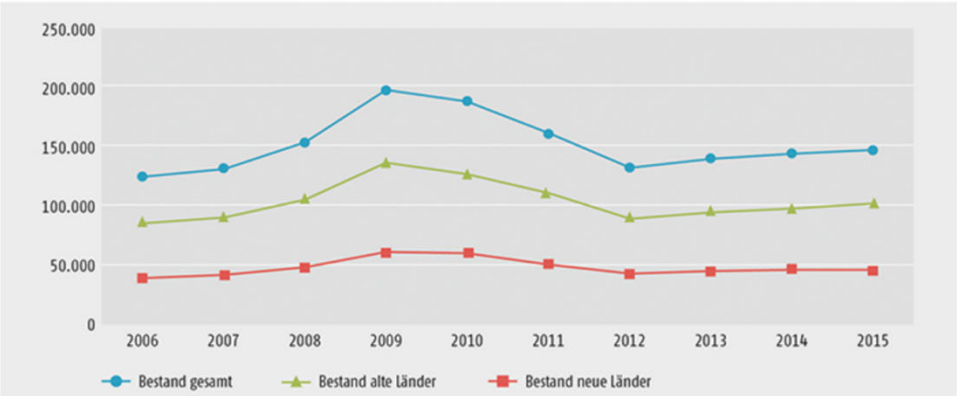
In Germany we have no restrictions or limitations for people who want to start a vocational education. You must not have any kind of school certificates or below any age.

Barriers for access exists in the companies but you will not find any statistics about it.

In Germany we have also possibilities for older people or people who must or want to change their profession. We call it retraining "Umschulung" and it is often funded by the Bundesagentur für Arbeit

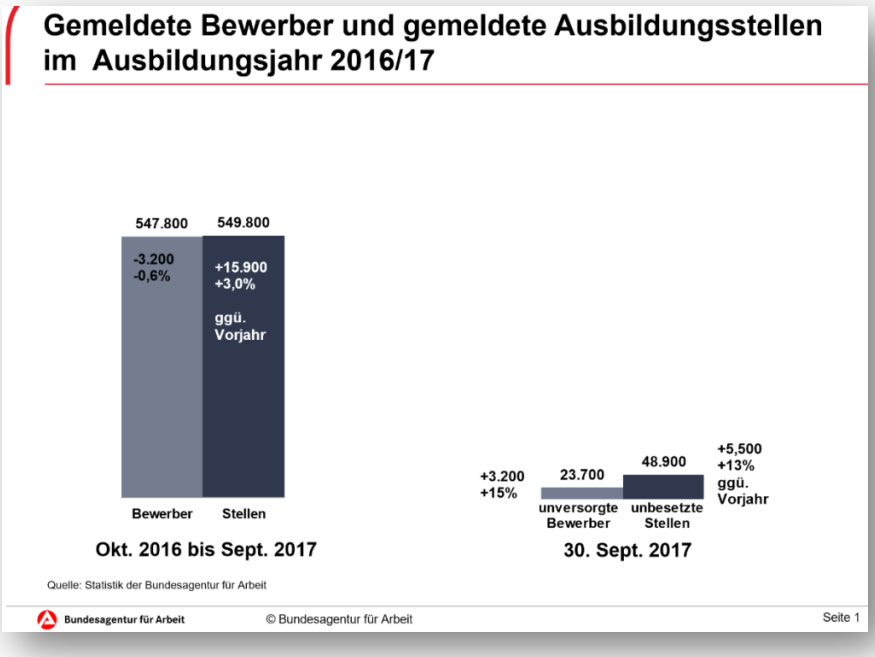
https://www.bibb.de/datenreport/de/2017/63785.php

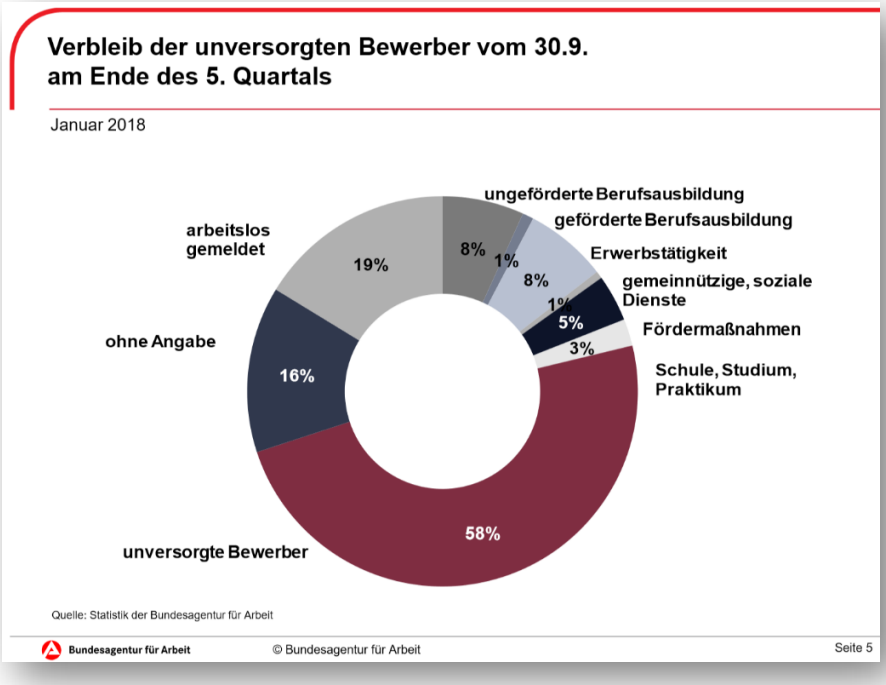
Schaubild B3.1-2: Durchschnittlicher Jahresbestand in Maßnahmen der beruflichen Weiterbildung nach SGB II und SGB III von 2006 bis 2015 (ohne Reha)

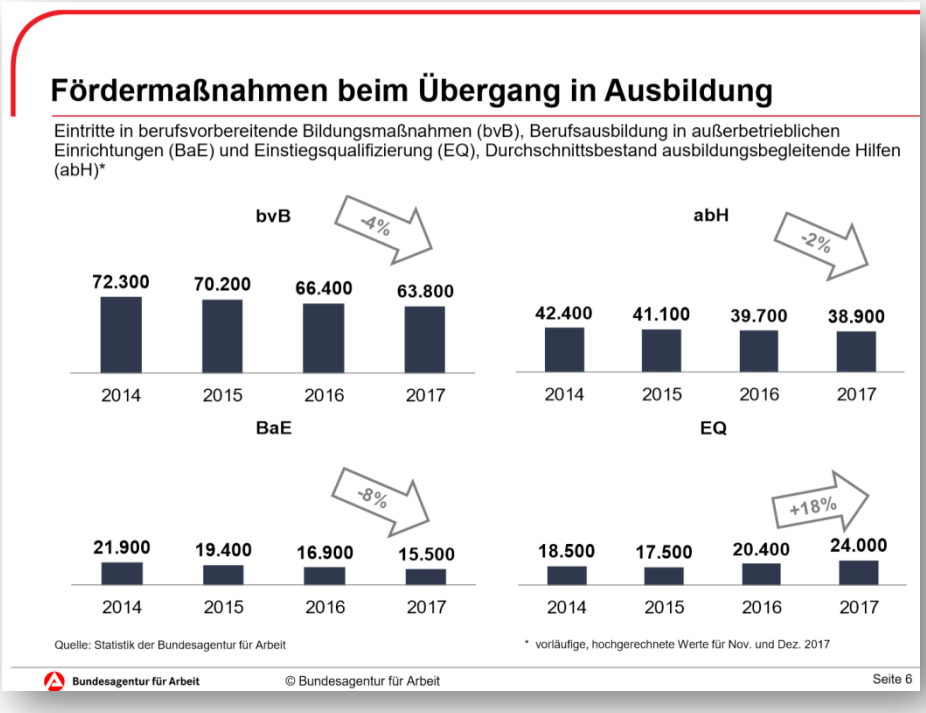


Quelle: Bundesagentur für Arbeit 2011b: Teilnehmer in ausgewählten Maßnahmen der Arbeitsmarktpolitik; Bundesagentur für Arbeit 2012a: Arbeitsmarkt 2011; Bundesagentur für Arbeit 2013a: Arbeitsmarkt 2012; Bundesagentur für Arbeit 2014a: Arbeitsmarkt 2013; Bundesagentur für Arbeit 2015a: Arbeitsmarkt 2014; Bundesagentur für Arbeit 2016b: Arbeitsmarkt 2015

Total statistic Germany for 2017: https://statistik.arbeitsagentur.de/Statischer-Content/Arbeitsmarktberichte/Ausbildungsmarkt/generische-Publikationen/AM-kompakt-Nachvermittlung-Abbildungen.pdf







In the figure above you can see the different funded possibilities in Germany.

Are there structure systems for transition from former school education to apprenticeship system?

Solange Schüler in Deutschland unter 18 Jahre alt sind müssen Sie entweder eine Ausbildung durchführen oder weiter schulisch qualifiziert werden. Neben den klassischen Schulformen wie Realschule und Gymnasium gibt es hier folgende Berufsqualifizierenden Möglichkeiten.

As long as students in Germany are under 18 years of age, they must either complete an apprenticeship or continue to be qualified for further education. In addition to the classical types of school such as secondary modern schools and grammar schools, there are the following career-qualifying opportunities here.

Berufsvorbereitende Angebote - Gemeinsamkeiten[1]

Alle berufsvorbereitenden Angebote verstehen sich als Starthilfe. Sie wollen Jugendliche ohne Ausbildungsplatz für einen Ausbildungsbeginn - spätestens im nächsten Ausbildungsjahr - fit machen. Je nach Schwerpunkt und Zielgruppe

- geben sie Hilfe bei der beruflichen Orientierung/der Berufswahl,
- vermitteln sie Grundbildung in einem Beruf/in einem Berufsfeld,
- fördern sie die Ausbildungsreife,
- ermöglichen sie das Nachholen von Schulabschlüssen.

Die Dauer ist in der Regel auf ein Jahr begrenzt. Jede Maßnahme kann bei Aufnahme einer Ausbildung vorzeitig verlassen werden.

Bildungspolitik ist in Deutschland die Sache der Länder. Deshalb gibt es nicht jedes berufsvorbereitende Angebot in jedem Bundesland. Die verschiedenen Angebote in den Ländern sind oft namentlich unterschiedlich, inhaltlich jedoch ähnlich.

Vocational preparation courses - Common features

All pre-vocational training offers are intended as a jump-start. They want to make young people without an apprenticeship training place fit for the start of their training - at the latest in the next training year. Depending on focus and target group

- give you help with career orientation/choice of career,
- They provide basic education in a profession/occupation,
- They support the training maturity,
- They make it possible to catch up school-leaving certificates.

The duration is usually limited to one year. Every measure can be abandoned prematurely upon commencement of training.

In Germany, education policy is the responsibility of the Länder. That is why not every vocational preparation offer exists in every federal state. The different offerings in the various countries often differ by name, but are similar in content.

[1] http://planet-beruf.de/eltern/mein-kind-unterstuetzen/stellensuche-bewerbung/weitere-beitraege-stellensuche-bewerbung/glossar-berufsvorbereitende-angebote/

Einstiegsqualifizierung EQ

Nahezu 40.000 Schülerinnen und Schüler sind in einer sogenannten Einstiegsqualifizierung. Hier wird neben der Beschulung (Niveau Klassenstufe 8 bis 9) ein berufsqualifizierendes Praktikum an mindestens drei Tagen in der Woche durchgeführt. Die Maßnahme dauert maximal ein Jahr und soll zur Ausbildungsreife führen.

Die Einstiegsqualifizierung gibt es in allen Bundesländern. Die EQ ist ein Langzeitpraktikum, das zwischen sechs und zwölf Monaten dauert. Es wird in einem Betrieb durchgeführt, der als EQ-Betrieb bei der Agentur für Arbeit gelistet ist. Jugendliche lernen in der EQ den Stoff des ersten Ausbildungsjahres im Betrieb. Alle vermittelten Fähigkeiten werden vom Betrieb bescheinigt. Ein begleitender Besuch der Fachklasse an einer berufsbildenden Schule ist möglich. Die Bausteine der EQ können für eine spätere Ausbildung anerkannt werden.[1]

Entry qualification EQ

Nearly 40,000 pupils are enrolled in an initial qualification. In addition to the schooling (level 8th to 9th grade), an internship with professional qualifications is carried out here on at least three days a week. The measure will last a maximum of one year and should lead to the completion of training.

The entry qualification is available in all federal states. The EQ is a long-term internship lasting between six and twelve months. It is carried out in a company listed as an EQ company at the Federal Employment Agency. In the EQ, young people learn the subject matter of their first year of training in the company. All imparted skills are certified by the company. An accompanying visit of the subject class at a vocational school is possible. The modules of the EQ can be recognized for later training.[1]

BEJ - Berufseinstiegsjahr

Das BEJ gibt es in Baden-Württemberg und Bayern. Das BEJ richtet sich speziell an Jugendliche ohne Ausbildungsplatz, aber mit Hauptschulabschluss. Ihnen werden Inhalte des ersten Ausbildungsjahres aus einem Berufsfeld vermittelt. In Vorbereitung auf die Ausbildung wird außerdem Mathe, Deutsch und Sozialkompetenz unterrichtet. An zwei Tagen der Woche besuchen die Jugendlichen ein Praktikum. Das BEJ findet an berufsbildenden Schulen statt. [1]

BEJ - Career entry year

The BEJ is available in Baden-Württemberg and Bavaria. The BEJ is aimed specifically at young people without an apprenticeship training place, but with a lower secondary school leaving certificate. They are taught the contents of their first year of training in a vocational field. Maths, German and social skills are also taught in preparation for the course. On two days of the week, the young people attend an internship. The BEJ takes place at vocational schools. [1]

Bildungsträger

Für geförderte Maßnahmen der Agentur für Arbeit oder der Jobcenter in den Gemeinden stehen Bildungsträger wie das BBQ, der International Bund oder das Förderband (Mannheim) zur Verfügung die Schülerinnen und Schüler zusätzlich begleiten und auch auf die persönliche Entwicklung der Jugendlichen eingehen. Sie beraten Unternehmen auch bei Problemen mit Auszubildenden und leisten Ausbildungsbegleitende Hilfen die finanziell in den Gemeinden jedes Jahr neu ausgeschrieben werden.

Educational providers

Educational institutions such as the BBQ, the International Bund or the Förderband (Mannheim) are also available to accompany pupils and provide information on the personal development of young people for sponsored measures by the Federal Employment Agency or the job centres in the municipalities. They also advise companies on problems with apprentices and provide assistance during training, which is advertised every year in the municipalities.

3.3. Lithuania

3.3.1. Legal base – regulatory framework

Apprenticeship review

Signposting the apprenticeship path in Lithuania

ThematIc country revIews

Source: http://www.cedefop.europa.eu/de/publications-and-resources/publications/4140

Executive summary

This is a final report of the thematic country review (Tcr) on apprenticeship in Lithuania conducted between may 2014 and march 2015 by cedefop in cooperation with national stakeholders. The review is part of a pilot of cedefop's cooperation with individual member States undertaking reform of their apprenticeship systems or on their way to developing such systems as part of their formal education and training. The review draws on the outcomes of a wide consultation with stakeholders in Lithuania: representatives of the ministry of education and Science (meS), ministry of Social Security and Labour (mSSL) and ministry of economy (me); education and training institutions; industry sector organisations and individual companies; trade unions, youth and parents' organisations; teachers, trainers and students.

The views of various stakeholders are summarised and integrated in relevant chapters of the report. recommendations from the review will help the country to establish its apprenticeship system but also will gradually expand knowledge of contextual factors determining or hampering success of apprenticeship initiatives. european and national developments drew increased attention to apprenticeship in Lithuania and set some expectations. Apprenticeship is one of the priorities of the national strategy on education 2013-22 and one of the measures of the national programme for increasing employment 2014-20. Providing quality apprenticeships and other forms of work-based learning, and strengthening partnership with the private sector, are among the countryspecific recommendations for Lithuania in 2014 to increase the employability of its young people.

Lithuania is in the process of searching for an apprenticeship model that would best suit its traditions and context. The review focused on four priority areas of analysis set by the steering group: governance structures; the participation of and support to companies;

cooperation among learning venues; and quality assurance. The review showed that the regulatory framework for apprenticeship within the VET system is quite enabling to setting up apprenticeship programmes, for example:

(a) apprenticeship has been set as one of the forms of organisation of formal vocational education and training (veT) since 2008 (Parliament of the republic of Lithuania, 1997);

(b) new sectoral qualification standards and modular programmes are being

developed;

(c) traditionally, schools and companies cooperate to ensure work placements

for VET students;

(d) the government invested in developing veT infrastructure: 25 out of 41 planned sectoral practical training centres equipped with the most up-todate machinery and technology are already operational;

(e) mechanisms for social partner involvement are in place and there is interest and need for qualified workforce from industry. However, apprenticeship has not yet gained its position as a clear pathway in Lithuanian VET and there is a long way to go. most VET programmes are school-based, while the actual scope of apprenticeship is small. All apprenticeship programmes are implemented in projects funded by the ESF and youth guarantee.

A number of challenges need to be overcome through systematic approaches and information and communication:

(a) the dual status of an apprentice as a student and as an employee needs

to be further clarified;

(b) planning for apprenticeships based on the labour market analysis does not happen; this prevents estimating necessary resources;

(c) implementation provisions are missing or not clear to all stakeholders;

(d) the expectations and perception of apprenticeship differ significantly among stakeholders;

(e) apprenticeship is not well promoted to potential students, their parents and companies;

(f) there are no clear cost-sharing or compensatory measures in place to incentivise companies to take apprentices.

The Government of Lithuania, most prominently the ministry of education and Science (MES), is working hard to make it work. New amendments to the regulations are in the final stages of approval (at the time of report preparation). The review suggests that actions be undertaken in four directions, possibly in parallel:

(a) clarifying the vision for apprenticeship and defining the status of

apprentices for all schemes;

(b) building up the enablers:

(i) coordinating the existing effort of the ministry of education and Science, ministry of Social Security and Labour, and ministry of economy and the social partners;

(iii) starting small through a national pilot project in selected sectors and selected VET providers;

(iv) steering the use of the sectoral practical training centres to the benefit of all;

(v) mainstreaming the results of past projects;

(vi) improving the use of the e-diary;

(c) raising awareness and explaining what exists and what is expected:

(i) creating a one-stop shop for stakeholders, especially, for companies;

(ii) developing a comprehensive communication strategy for apprenticeship;

(iii) improving vocational guidance and counselling;

(d) fine-tuning and further coordinating regulation based on the progress of implementation.

The review provides detailed country-specific information and suggestions but only the country can act. The pathway to apprenticeship should be well signposted to all stakeholders and lead to recognised qualifications and better employability.

Governance

Source: www.cedefop.europa.eu/files/4140_en.pdf

Concluding remarks

Apprenticeship definitely has a place in education and training in Lithuania.

As a form of VET organisation, it is hardly found in IVET, which is predominantly school-based, but is implemented in continuing VET and nonformal learning on a small scale, and mainly through projects financed by the EU funds. In the review, almost all interviewees (companies, teachers, incompany

trainers, students) agreed that practical training is the most important for the future employment of young people. Apprenticeship should become a pathway to an explicitly defined goal – signposted. All players (the State, employers' organisations and trade unions, VET providers and companies) must get on board. They must use the full potential of apprenticeship, not only to overcome youth unemployment, but also to attract more learners of all ages to vocational training, and improve

skills for employability in Lithuania.

Alignment to labour market need

The educational form of vocational education and training is applied by a vocational institution or other institution where theoretical and practical training is carried out. When vocational institution enters into vocational training contract with any company, institution, or organization for which vocational training is not a core activity, i.e. farmer, freelance teacher and an apprentice, this vocational training can be carried out at the workplace.

The provider of vocational training and person under training enters into job and a vocational training contract based on the form of an apprenticeship. After the provider of vocational training has concluded vocational training contract with vocational institution and the student, the practical training of the person can be organized at his/her place of work, and theoretical training can be carried out at vocational institution.

Apprenticeship executer can be any company that needs qualified staff trained according the specifics of the company's work. Company on apprenticeship base can train both new and existing employees.

To train current employees or to find new ones the company contacts the nearest labour market training center. The need of employees' training is discussed in the presence of company; then training schedule (dates, time and place where the employee will work and study), and a curriculum is drawn up. The company, an apprentice and the educational

institution sign tripartite vocational training contract. Training is based on vocational curricula. The list of curricula is filled according to the needs of the company.

During the apprenticeship training, the company employs an apprentice and pays for him or her remuneration. Company assigns the master to apprentice - more qualified person. It is recommended for master to take part in training to get educational knowledge and skills. Training and learning in workplace covers 50-80 percentage of all the training, and the remaining part is dedicated to learning in educational institute.

Work in the company is considered as training only if apprentice's workplace relates to the area in which he or she strives for skills or qualification. However, not all the work of an apprentice is learning. He or she also performs other assigned functions that may not be related to the training.

The training is organized in stages from the easiest to the most challenging tasks. The training process is organized in such a manner that the competences and abilities for a specific job or work field are obtained more smoothly.

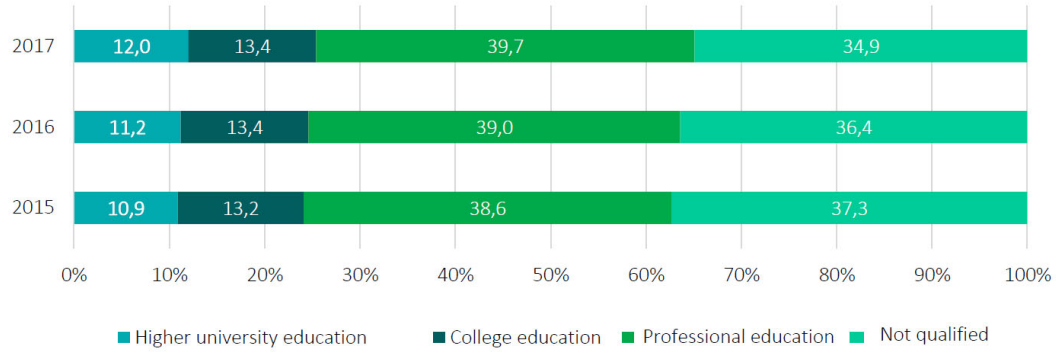
Upon completion of training person will be issued with a state-recognized certificate.

When apprentice already gets qualification company can to conclude an employment contract based on higher qualification.

Data of actual labour market

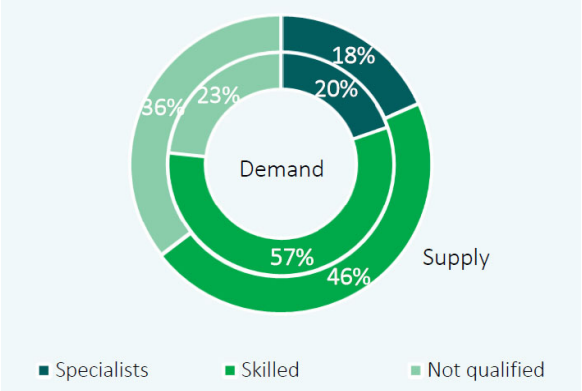
In 2017 the territorial labour markets registered some 252.0 thousand unemployed persons. Majority of them are men - 56.8%. Almost 32% of unemployed persons in labour market live in rural areas. Based on the last workplace data the 45% of unemployed persons registered in labour markets in 2017 were qualified workers and service personnel.

According to Lithuanian labour market data employers registered 222.1 thousand vacancies in 2017. More than half of all them (almost 57%) were vacancies for qualified workers, and growing need for construction workers was observed. The biggest employer was service sector.



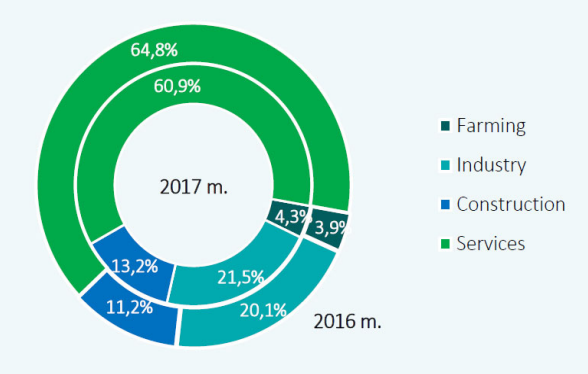
1 figure: Unemployed by qualification

Recently, as a result of the shortage of certain professional workers, more and more employers prioritize such qualities as motivation to work and study, responsibility, honesty, initiative, creativity, ability to work in a team and flexibly adapt to the changing needs of the labour market.



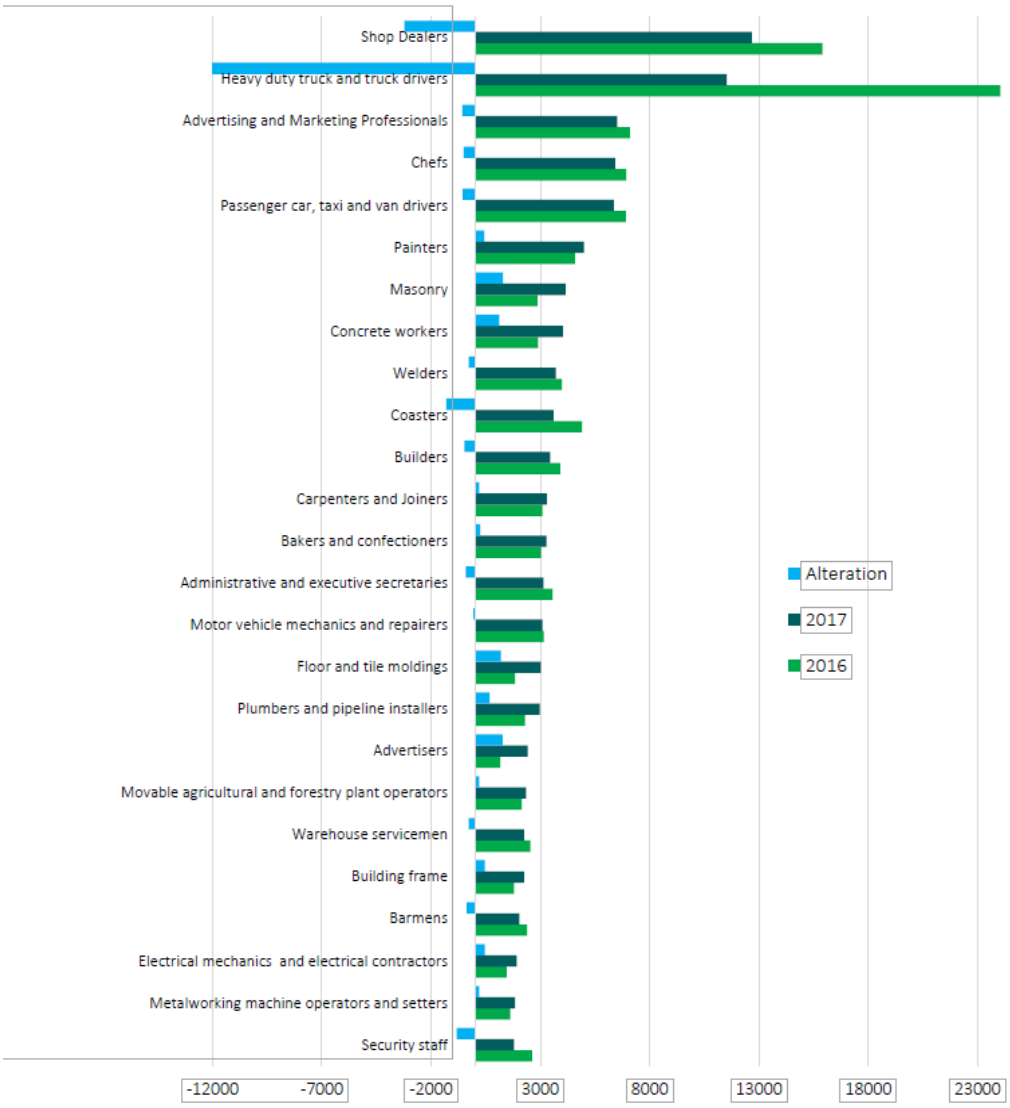
2 figure: Supply - Demand in 2017

3 of 5 registered vacancies were in service sector, 21.5% - in industry field, and more than 13% - in construction field. Compared to the same period of last year, in the demand structure the share of service sector decreased 3.9% point while the share of other sectors increased, particularly in construction field - by 2% point.



3 figure: Demand structure by economic activity

The decrease of registered vacancies in the transport and storage and trade sectors has led decline in the services sector. However, both dealers and heavy truck drivers and truck drivers still remain on the top of the top ten of the most demanded professions. Many vacations have been registered for advertising and marketing professionals, cooks, car drivers, taxi drivers and van drivers, dyers, masonry, concrete workers, and welders.



4 figure: The most demanding professions change 2016-2017

With the increasing absence of qualified workers of certain professions, more job-seekers were sent to vocational training and the volumes of public works were reduced. From July 1 of this year after the Employment Support Law entered into law, the labour market no longer conducts public works, and they are organized by the municipalities.

Top 10 of highest numbers of apprenticeship professions:

1. Shop dealers
2. Heavy duty truck drivers and truck drivers
3. Cooks
4. Dressmakers

5. Plumbers and pipeline installers
6. Welders
7. Vehicles' mechanics and repairers
8. Builders
9. Dyers and related workers
10. Carpenters and Joiners

The Lithuanian Labour Market has been working on short-term - one-year term labour market forecasts for more than 20 years. They are conducted to forecast measures to mitigate the effects of unemployment, balance labour supply and demand flows, and foresee the need to increase the efficiency of services. The forecast of the Labour market for 2018 is based on the analysis of economic, demographic and labour supply and demand indicators.

Job seekers with the following professional qualifications will have the greatest employment opportunities in 2018: electricians and electric carriers, heavy truck drivers and truck drivers, butchers, fish cutters, adjusters and operators of the metal processing machines, builders, and cooks.

Job-seekers with the following professional qualifications will have the lowest employment opportunities this year: hairdressers, car drivers, taxi drivers and van drivers, and florists.

Financing of apprenticeship system

Vocational education at educational institution is financed from the state budget, municipal budget, employment fund, social partnership funds, and other legally received funds.

Finances for formal vocational education are given from the state budget and/or the employment fund according to the methodology approved by the government for calculating the teaching means per student.

For social partners who are implementing apprenticeship programs finances are allocated according to approved estimates of revenue and expenditure from the ministries, whose field of the regulation has relevant functions, appropriations for this purpose.

Continuing vocational education is carried out at the expense of the company, institution, farmer or learner oneself. In accordance with the procedure established by law, finances for training company's, institution's or farmer's workers can be dedicated from the state budget too.

Company that trains the apprentice must employ him/her and pay a salary.

Share of company based training and in school based training

The length of the apprenticeship program depends on the chosen specialization and the training center.

Apprenticeship must be implemented in accordance with curriculum based on recognized standards and approved educational content. Apprenticeship must include the full range of results that must be achieved by the student in order to qualify.

Duration of training programs is 1 or 2 years. Duration of the training week is 5 days or 40 hours per week. This duration includes theoretical education, practical training and autonomous learning. About 70% of training are conducted in company, and the rest of the part, 30%, at educational institution.

The different models of timetables at one or another place are used. I.e., one day student can study at practical educational institution and then work for four days in company or spend one or two weeks in a practical educational institution, and then one or two weeks work in company.

Additional training

The core of apprenticeship is learning at least in two places: in the company (the main place) and in the practical education institution. However sometimes, students also need to learn in third place in order to gain skills and competences that the first two cannot offer. This is usually the case when most of the apprenticeship companies are small and medium-sized and work in a narrow field. Then, the organization from the several companies or the Chamber of Commerce, Industry and Crafts can also be turned on.

Certification and accreditation

Competency assessment is a continuous process of collecting, interpreting and aggregating information about the progress and achievements of apprentice, and is usually rated by score. During the competency assessment learning results are rated. The final step of the qualifying educational programs is knowledge testing (exam, inclusion). In the process of training several intermediate knowledge checks are conducted from the vocational institution side.

During the competency assessment, beside other theoretical knowledge, practical skills, abilities and provisions can be evaluated. The assessment scale and description is approved by the educational institution. The pass-through threshold is set up and confirmed by the institutions, the company, or other evaluator(s), and is based on legal acts, standards, national and international practice or system.

The competency assessment in the company is carried out by the master. When apprenticeship training is conducted together with the educational institution, the master and the teacher of the vocational institution compile a list of practical tasks, and draw up them to master's practical training journal. The master assigns all these practical tasks over time to make sure that the apprentice has skills to perform them all alone. Then master can sign in the journal that all the tasks have been completed.

Final competency assessment is possible only when pass-through threshold is passed during intermediate settlement and when the entire task journal is completed. The form of the final competency assessment is determined by the educational institution. Competencies are assessed by the commission formed by the order of the director of the educational institution. The commission is composed of representatives of educational institutions, companies and companies' organizations, or the Chamber of Commerce, Industry and Crafts.

Quality Assurance

The assessment and validation of competences acquired through training is an important aspect of apprenticeship quality assurance. The system of external evaluation, carried out by accredited competence assessment bodies (i.e., sectoral organizations and recently some training institutions), creates favourable conditions for the development of apprenticeship programs which lead to professional qualifications.

The quality of the overall training is educational institution responsibility. The educational institution is responsible for the preparation and completion of documents; it also designates a vocational teacher, organizes and coordinates the entire training process, organizes midterm and final apprenticeship examinations, and ensures close cooperation with the company. Qualification certificate is issued only after obtaining the competences provided in the curriculum.

A vocational teacher prepares and matches up with the master individualized curriculum, training schedule, and practical training journal. He or she also conducts theoretical and practical training (at workshops, sectoral practical training centers, if needed, and in

company). Vocational teacher coordinates all the training process so that apprentice acquires all competencies according to the needs of the company and according to the curriculum. He or she also organizes midterm and final assessment of apprentice. Communication with the master is happening during all practical training.

The company must create such conditions for apprentice that he or she could get high-quality practical training at the workplace. At the company, the master is assigned to the apprentice. The master is constantly cooperating with the educational institution. To fulfill different levels and complexity tasks several masters can be assigned.

Master in apprenticeship is any person occupying a position in the company who has detailed knowledge and skills of particular field and who is able to transfer them to the apprentice.

The master teaches the apprentice to work qualitatively, according to technology, deadlines and economic indicators. The quality of the practical tasks performed by the apprentice is constantly evaluated and the entries in the practical training journal are made. The Master ensures the implementation of the curriculum at the workplace in accordance with training institution. Communication with the vocational teacher is happening during all practical training.

Pathway into apprenticeships

Apprentice can be any person whose intention is qualification and who is already working in the field of construction, welding, transport, transport mechanization, food production and service, nursing, various services for people (beauty treatments, hairdressing, sewing), administration and business organization, business services, computer or other spheres.

Apprentice can also be out-of-work person who wants to work in these areas.

Recruitment is an indispensable element of apprenticeship, so only an employed person can become apprentice and raise qualification during his/her work.

Unemployed persons may seek to become an apprentice by taking part in labour market re-qualification program. He or she must arrange meeting by telephone and arrive at the nearest labour market training center. During this meeting, it is determined what exactly this person person wants to learn. Then person completes the questionnaire and waits for the training center to find right company for him/her. A person can also look for work himself. When the company is found and the person succeed in motivational conversation, the

company concludes an employment contract with him, and then a trilateral apprenticeship contract with the educational institution and the apprentice is conducted.

If the company wants to train already existing worker, it should contact the nearest training center. During the meeting, the company will formulate its need to the training center and will complete the order sheet. Then the company and the training center will jointly review and draw up an employee curriculum. After that, the tripartite agreement will be signed and training will begin.

Information, Advice and Guidance**:** There are currently no such systems in Lithuania.

3.4. United Kingdom

3.4.1. Legal base – Regulatory framework

- **An apprentice spend at least 50% of time at work over the course of the apprenticeship**. This is usually 30 hours each week, where the focus is on learning to do the job. The apprentice could be learning from colleagues across all levels of the business, typically working closely with someone more senior who will coach the apprentice and review the progress. The employer will also give time off to study during the working hours.
- **Apprentices also spend time attending college, university, training provider, or training at work**. The learning and part-time study element of an apprenticeship fits around the job commitment, and will be agreed with the employer. The apprentice might attend one day per week ('day release'), in blocks of a week or more ('block release'), or study online. Some schemes use a combination.
- **Apprentices complete assessments during and at the end of the programme**, which tests both academic learning and occupational competence developed through on-the-job training. Find details of what you will learn in the standard or framework for each apprenticeship, and how your learning and skills will be assessed in the assessment plan for a particular apprenticeship.

To get an idea of what apprenticeships are available to study, take a look at the government's A-Z list of apprenticeships. Find out more on the GOV.UK website.

Apprentices have the same rights as other employees. They are entitled to a contract of employment, and a minimum of 20 days paid leave each year, plus bank holidays. They will

work at least 30 hours per week with your employer, and undertake part-time study through a mixture of day/block release, distance, and e-learning.

The employer and university, college, or training provider will set out details of what they will provide and what they expect from an apprentice, both as an employee and as a student, in two key documents.

Apprenticeship agreement – signed by the employer and apprentice, it is equivalent to a contract of employment, giving details of what the employer and apprentice agree, including:

- how long you'll be employed
- the training you'll receive
- your working conditions (such as pay, working hours, holidays, and any support or benefits provided)
- the apprenticeship framework or standard you will be working to, and the skill, trade or occupation for which you are being trained

Commitment statement – signed by the employer, the apprentice, and training provider, includes:

- the planned content and schedule for your training
- the qualifications you are working toward
- what is expected and offered by the employer, the training organisation, and you, as the apprentice
- how to resolve queries or complaints

Source: https://www.ucas.com/apprenticeships-in-the-uk

Some regulations concerning wages and salaries of apprentrices (England):

- As an apprentice, you're entering employment. Legally, an employer must pay an apprentice the National Minimum Wage. For apprentices, this is currently £3.70 per hour.
- The number of Apprenticeship standards will soon increase to over 2,000 and will cover all levels up to degree-equivalent 'higher Apprenticeships'. This means greater training possibilities for both employer and employee, particularly when you consider the funding incentives available.

- Businesses are able to access funding from the Government to cover 90% of the Apprenticeship costs and, if the business employs up to 50 staff and the apprentice is aged 16-18, 100% of the costs are covered. An Apprenticeship, therefore, offers businesses a quality, comprehensive training programme for their employees at a vastly reduced cost to the employer. The national minimum Apprenticeship wage is the lower, not the upper limit. Therefore you could attract older or more experienced apprentices to your business by offering a higher wage or, if using an Apprenticeship programme to upskill existing staff, you can continue to pay them at their current salary.
- You will need to cover your day-to-day living costs, rent, travel costs, equipment, and materials.
- Apprentices are not eligible for student loans.

3.4.2. Salary

Those aged 16 — 19 in the first year of their apprenticeship receive at least the minimum apprenticeship wage of £3.70 per hour. Some employers pay significantly more than this rate, and there are examples of both higher and degree apprenticeship adverts offering salaries of between £16,000 and £24,000 per year.

Many employers advertise roles with a 'competitive salary'. This could mean the salary and benefits will be in line with similar roles for other organisations, or that it depends on your current skills and experience. It's important that you confirm the salary with the employer.

Other financial benefits: Alongside the salary, some employers offer other benefits including a pension, access to a car, leisure facilities, or a relocation allowance if you have to move.

3.4.3. Discounts for apprentices

You'll be classed as an employee, rather than a student, so you won't be entitled to student discounts. But the National Union of Students (NUS) offers an NUS Apprentice Extra Card.

You may also be eligible for discounts on public transport, with many schemes running on a local basis, like the Apprentice Oyster photo card in London – giving apprentices 30% off certain journeys.

Source: https://www.ucas.com/money-funding-and-finance-apprenticeships-england

Further readings:

https://www.gov.uk/education/apprenticeships-traineeships-and-internships

https://epi.org.uk/wp-content/uploads/2018/04/Apprenticeships-in-England_2018.pdf

Governance

Ten things an applicant needs to know about apprenticeships

1. An apprenticeship is a real job with training. Apprentices are given real responsibilities, expected to work hard, and are given a contract of employment, holiday, and sick pay – exactly the same as any other member of staff! They will also gain a qualification and valuable skills and experience.
2. While working for an employer, apprentices also work towards a qualification. They are supported by a training provider (a university or college), that will help them achieve their qualification and make sure they complete their apprenticeship.
3. An apprenticeship can take two to four years to complete and is usually made up of three parts – all completed on the job, online, or in a classroom.
4. There are hundreds of new apprenticeships in a wide range of industries and job roles– much more than the traditional apprenticeships, like construction and engineering. Apprenticeships are available in many jobs where previously, the only route to those jobs was through full-time, traditional university study, such as nursing and becoming a solicitor.
5. The majority of apprentices (around 90%) stay in employment. If they do change companies, it's usually because they're able to compete for a better job, perhaps with more pay or more responsibility.
6. Degree apprenticeships offer the benefits of higher education with none of the cost. Tuition fees are paid for by the employer and the government, so apprentices will graduate debt-free, without having to pay fees. Apprentices will also earn a salary from day one, so they are actually getting paid to study.
7. Degree apprenticeships are still quite new, so there are only a limited number of vacancies available at the moment. The number of vacancies is anticipated to grow over the next few years.

8. Apprenticeships have changed considerably over the last few decades and higher and degree apprenticeships are now a credible alternative to traditional full-time university courses.
9. Universities and colleges offer their degree apprentices a strong student experience – apprentices are still able to access the students' union, sports facilities, and student discounts.
10. You can apply for degree and higher apprenticeships at the same time as applying to uni. Applications for apprenticeships are made directly to the employer, usually through their own online application. Details of how to apply will be given on each apprenticeship vacancy.

Earn while you Learn – study an apprenticeship Inside this guide you'll find:

- apprenticeship key facts
- the difference between a uni degree and a degree apprenticeship
- who they are for
- •what they involve
- what apprenticeships are available
- entry requirements
- how and when to apply
- the recruitment process and interview tips

Source: **https://www.ucas.com/file/120301/download?token=DPdwJ0EV**

Additional information

Who are apprenticeships for?

To start an apprenticeship, you need to be:

- aged 16 or over
- living in England
- not in full-time education

Do you want to study in the UK?

If you're thinking about applying to study an apprenticeship in England, Scotland, or Wales, you must be eligible to work in the UK, and meet any other entry requirements. It's important to contact potential employers to check their eligibility criteria.

Apprenticeships aren't the 'easy option'.

Holding down a full-time job and studying takes commitment and hard work, and it won't be right for everyone. No matter what kind of career you want to follow, you need to do your research and find out if you can reach your career goals through an apprenticeship, or if you need to/would

prefer to study full-time at university or college. An apprenticeship could be perfect for you if you:

- have a clear idea of the career you want to pursue and are willing to commit to work and study
- are ready to start work – an apprenticeships is primarily a job
- wish to continue studying at a higher or degree level, and you prefer a more practical and work-related approach to studying
- are well organised and will be able to cope with the competing demands of work and study at the same time
- are prepared to be assessed through a mix of assignments and written work/essays, reports, practical exercises, end tests, and exams Take a look at the pros and cons of apprenticeships at ucas.com/apprenticeships.

Let's talk money

Many people think apprentices aren't paid very much, and this can be true depending on the employer. Legally, an employer must pay an apprentice the National Minimum Wage – for apprentices, this is currently £3.70 per hour. This is lower than the normal National Minimum Wage, but it recognises that some people will be going into their first job with no experience at all.

What's the difference between doing a degree at uni and doing a degree apprenticeship?

Both routes offer the opportunity to gain a full degree qualification, but there are some key differences.

- Apprentices split their time between university study and the workplace, and are employed throughout the course.
- Traditional degrees offer a much broader choice of courses, subjects, subject combinations, and the range of modules you can cover. However, degree apprenticeships are limited to the universities working with the employer and the employer's location, and the course content is industry-specific.

Degree apprenticeships are focused on developing the skills and knowledge for specific jobs and careers. Traditional degree courses, on the other hand, offer a wide range of career prospects, but some are focused on particular professions and there are still many careers that require traditional qualifications which cannot be attained with a degree apprenticeship.

- The experience of student life will be different for apprentices. Traditional on-campus learning, with the social life it offers, can be particularly important to some students. While degree apprentices do experience some elements of campus life, it will be different and combined with additional work-based experience.
- Degree apprenticeship fees are funded by the government and the employer, and apprentices are paid a wage throughout the apprenticeship, meaning degree apprentices can be debt-free. Studying a traditional degree will cost students their tuition fees (around £9,000 per year) plus living expenses. There are student loans, bursaries, and scholarships available – find out more at ucas.com/finance-and-support

Also Universities and colleges are involved in higher and degree apprenticeships.

Over 70 universities and around 200 colleges are approved to deliver higher and degree apprenticeships. This list is growing all the time as new apprenticeships are developed and more

employers look to recruit apprentices. Always check the university or college website, and each apprenticeship vacancy will identify the university or college involved.

Source: **https://www.ucas.com/file/120301/download?token=DPdwJ0EV**

What are the **entry requirements** for apprenticeships?

Apprenticeships are available at four levels. Each level has different entry requirements, which may depend on the skills and qualifications you hold.

Level	Entry requirements
Intermediate (Level 2) – generally considered to be equivalent to five GCSE passes.	Applicants need to be over 16 years old, and show they have the ability to complete the programme.
Advanced (Level 3) – generally considered to be equivalent to two A level passes.	Some industries want apprentices who have three or more GCSEs, but other employers don't specify any formal qualifications. Some may ask for previous experience in the industry. Check apprenticeship vacancies to see if there are any specific subjects and/or grades you need to have.
Higher (Level 4 and above) Level 4 – equivalent level to an HNC, a foundation degree, or the first year of an undergraduate degree. Level 5 and above – equivalent to full degree.	Entry can include at least five GCSEs grades A – C, and Level 3 qualifications, including A levels, NVQ/SVQ Level 3, or a BTEC National. Some will expect or require applicants to have subjects related to the particular apprenticeship. Check apprenticeship vacancies to see if there are any specific subjects and/or grades you need to have.
Degree (levels 5 to 7) – these are new and enable apprentices to achieve a full bachelor's or master's degree as part of their apprenticeship. Levels 5 and 6 – equivalent to a full degree. Level 7 – equivalent to a master's degree.	Entry can include at least five GCSEs grades A – C, and Level 3 qualifications, including A levels, NVQ/SVQ Level 3, or a BTEC National. Some employers have specific entry requirements. For example, recent IT degree apprenticeship adverts have required an A level (or equivalent) grade range of ABB to CCC. Many employers will expect or require applicants to have qualifications in subjects related to the particular apprenticeship. Check apprenticeship vacancies to see if there are any specific subjects and/or grades you need to have.

The level of apprenticeship you start at will depend on the kind of job you are applying for. You can start an apprenticeship at the level appropriate to the job, and work all the way up to achieving a master's degree for some job roles.

Each apprenticeship vacancy listing will specify the entry requirements and qualities the employer is looking for. For higher and degree apprenticeships, employers are generally asking for A levels and other Level 3 qualifications.

Source: **https://www.ucas.com/file/120301/download?token=DPdwJ0EV**

Further reading:

https://www.gov.uk/government/publications/apprenticeship-funding-and-performance-management-rules-2017-to-2018

Alignment to labour market need

Occupational profiles in companies

Apprentices are aged 16 or over and combine working for an employer with studying to gain skills and knowledge in a specific job. Apprentices can be new or current employees and will work with experienced staff, learn job-specific skills and study during their working week (for example, at a college or at a training organisation).

Employers expect to directly influence the design of the learning the apprentices receive through the apprenticeship programme and that the whole apprenticeship system is flexible and responsive to the ever and more rapidly changing need of their industry. They will use Government Employment and Skills data as the vehicle to assist with new apprenticeship developments in specific industry needs and identified/predicted shortfalls in skills and knowledge.

Schools and training

Schools have a statutory duty to ensure that all year 8-13 pupils have access to independent careers guidance, including advice on apprenticeships. The project is funded by the Skills Funding Agency and National Apprenticeship Service and will offer young people in England the skills they need to get on in work.

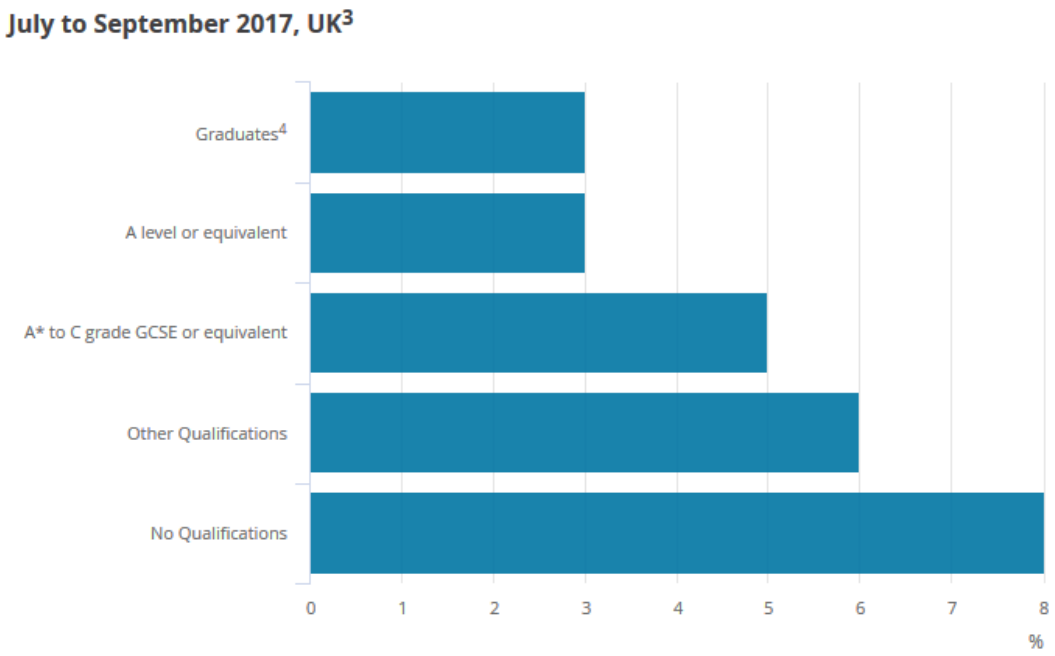
The United Kingdom in the 21st century is diverse and complex and our apprenticeship programmes respond accordingly. We support people when and where they need it most and equip services to respond to challenges, such as an ageing population, a changing climate, new technologies STEM (science, technology, engineering and maths sectors) and globalisation.

The issues faced can only be tackled through new ways of working, including joined-up programmes with industry to reinforce and build upon what people and communities are doing for themselves.

Data of actual labour market

Unemployment[1] by the highest level of qualification held

July to September 2017, UK



Source: Labour Force Survey

Notes:

1. The unemployment rate is the number of unemployed people in the relevant population group divided by the economically active population for the same population group.
2. 'No Qualifications' refers to all adults living in the UK who were not enrolled on any educational course on the survey date. The age range focuses on people aged between 21 and 64.
3. A graduate is defined as a person who is aged over 20, not enrolled on any educational course, who has a level of higher education above A level standard. Graduates are aged between 20 and 64.

Proportion of apprenticeship qualification in the workforce

Since 2015 there has been an increase in the overall number of employers with recent apprenticeship completers, from 84,794 in 2015 to 88,253 in 2017; an increase of 4%.

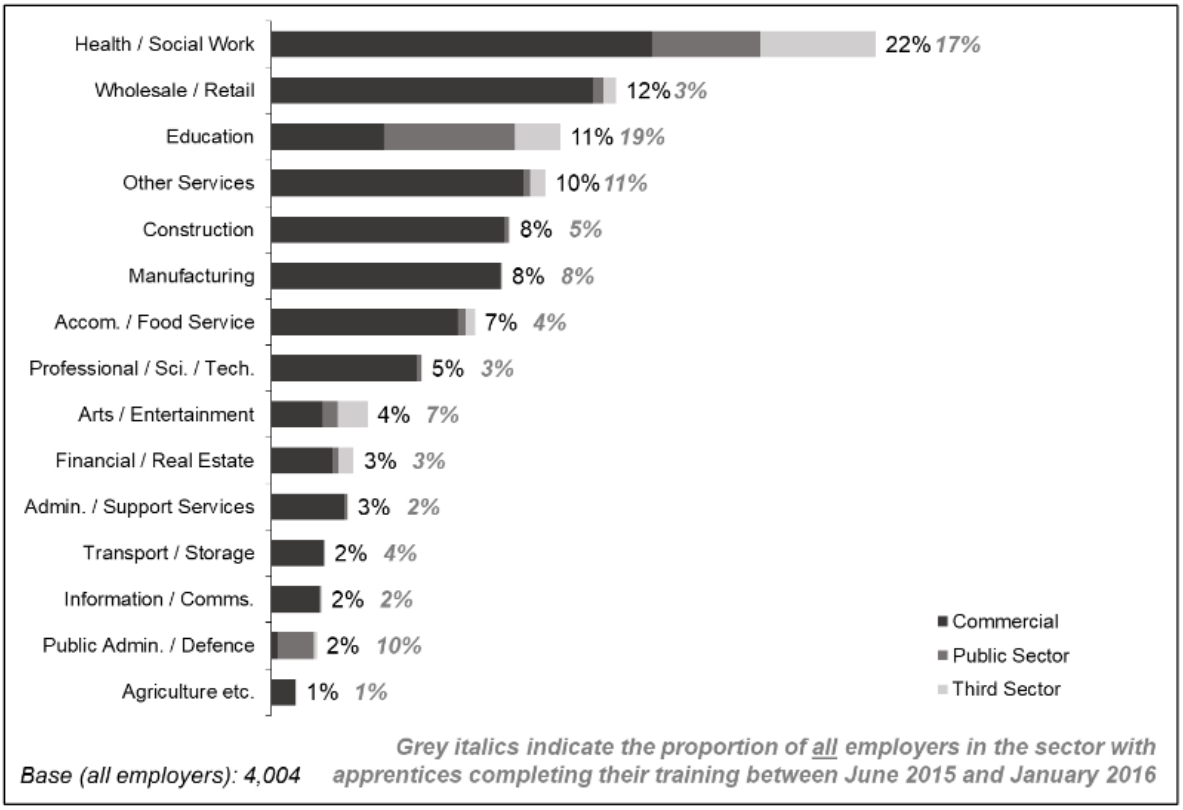
Subject Area	2017 employers		2015 employers		2014 employers
	%	Number*	%	Number*	%
Agriculture	3%	2,500	3%	2,400	3%
Arts and Media	*%	400	*%	300	n/a
Business	31%	27,400	34%	29,200	34%
Construction	6%	5,000	7%	6,100	9%
Education	2%	1,700	2%	2,000	n/a
Engineering	16%	14,500	13%	11,300	10%
Health	22%	19,300	23%	19,200	22%
ICT	4%	3,100	3%	2,500	3%
Leisure	3%	2,500	3%	2,700	3%
Retail	22%	19,300	22%	18,800	23%
Science	*%	100	n/a	*	n/a
All employers		88,300		84,800	

Source: Individualised Learner Record (2013 to 2016) ** rounded to the nearest 100*
Percentages sum to greater than 100%; employers can have completers in multiple subject areas.

Top 10 of highest numbers of apprenticeship professions

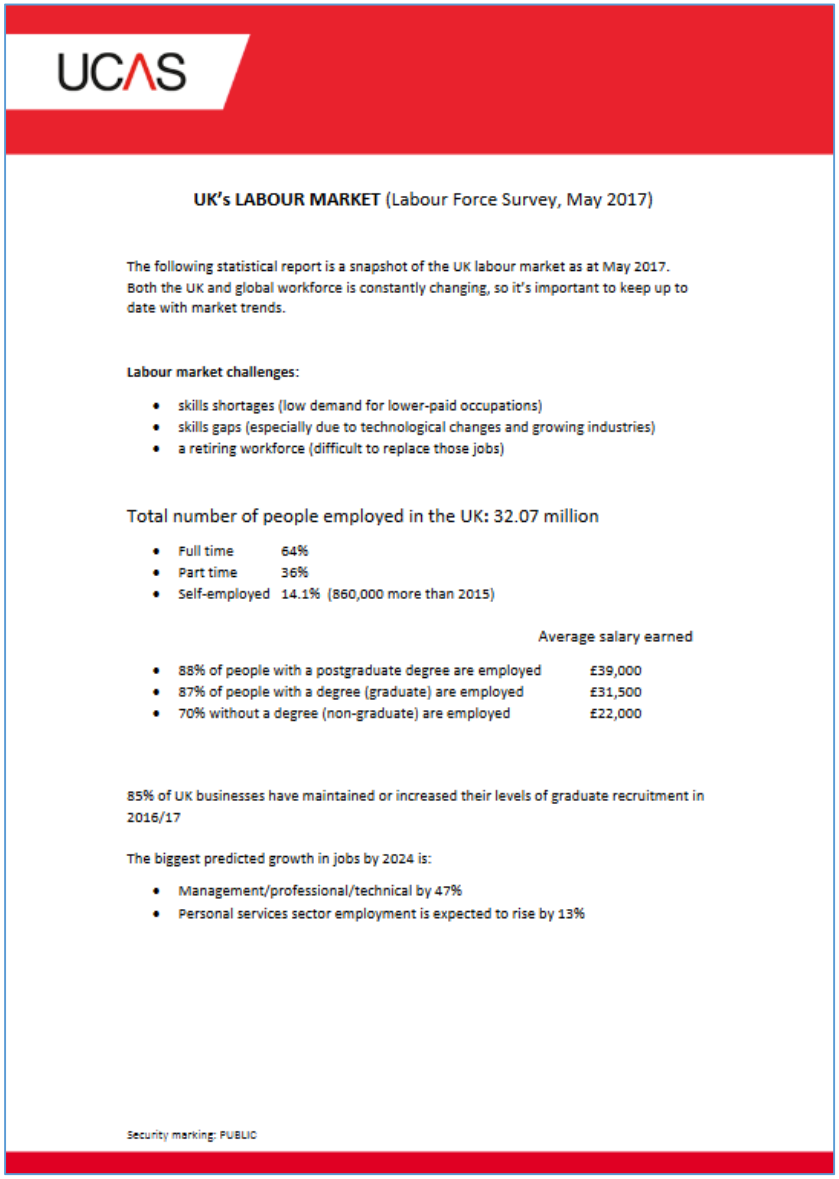
The table below shows employers of apprentices broken down by sector, and also provides a breakdown within those sectors into commercial, public sector and third sector (charitable, voluntary and co-operative) employers. As seen in the chart, employers providing apprenticeships tended to be mostly in the commercial sector (77%). Employers of apprentices in the public sector (12% of apprentice employers) tended to be in specific sectors – Education, Health & Social Work and Public Administration & Defence.

The sector profile of employers confirms Health and Social Work was the single largest sector, accounting for just under a quarter (22%) of apprentice employers. Other prominent sectors included the Wholesale and Retail sector (12%), Education (11%), Other Services (10%, of which a large component is hairdressing and barbering), Construction (8%), Manufacturing (8%), and Accommodation/Food Service (7%).



Note: UK statistics often use Engineering and Manufacturing as synonyms

Demand of labour market (if possible forecast studies)



UCAS

UK's LABOUR MARKET (Labour Force Survey, May 2017)

The following statistical report is a snapshot of the UK labour market as at May 2017. Both the UK and global workforce is constantly changing, so it's important to keep up to date with market trends.

Labour market challenges:

- skills shortages (low demand for lower-paid occupations)
- skills gaps (especially due to technological changes and growing industries)
- a retiring workforce (difficult to replace those jobs)

Total number of people employed in the UK: 32.07 million

- Full time 64%
- Part time 36%
- Self-employed 14.1% (860,000 more than 2015)

	Average salary earned
88% of people with a postgraduate degree are employed	£39,000
87% of people with a degree (graduate) are employed	£31,500
70% without a degree (non-graduate) are employed	£22,000

85% of UK businesses have maintained or increased their levels of graduate recruitment in 2016/17

The biggest predicted growth in jobs by 2024 is:

- Management/professional/technical by 47%
- Personal services sector employment is expected to rise by 13%

Security marking: PUBLIC

Headlines:

- High level STEM skills are of key importance to the performance of the UK economy in terms of jobs, productivity, innovation and competitiveness
- Engineering professionals and IT professionals appear to be particular priorities in terms of labour market need
- There appear to be gaps in the coverage of higher apprenticeship standards and frameworks in some in areas of need
- Apprenticeships need to support coherent career pathways but also provide sufficient coverage of the range of jobs roles within each occupational area.

Financing of apprenticeship system

With effect from April 2017, the Government introduced an 'Apprenticeship Levy' which will be paid by large employers to build and maintain a skilled workforce that can compete in the global market place. The levy will increase the current funding and is expected to raise £3 billion annually over the next five years. This will be used to increase the number of people starting apprenticeships to three million by 2020 (an increase of 30%).

The main facts about the Apprenticeship Levy:

- From April 2016 organisations will no longer be required to pay National Insurance Contributions (NIC) for apprentices aged under 25.
- Employers with a UK payroll bill of over £3 million per annum will pay an Apprenticeship Levy at a rate of 0.5% of their total wage bill with effect from April 2017.
- Employers with a pay bill less than £3 million per annum will not pay the levy, but can claim government funding towards their apprenticeships training on approved courses. They will however, have to pay a small financial contribution of 10% of the costs.
- Organisations will pay the levy, regardless of whether or not they subsequently reclaim the funding available to invest in apprenticeship training.
- The levy will be paid monthly through HMRC 'Pay As You Earn'.
- Employers will receive an allowance for each apprentice and be able to use their levy contributions to fund external training, but only with an approved training provider.
- Employers in England who pay the levy and maximise their apprenticeship training may be able to 'get out more than they pay' through a top-up to their digital accounts.
- The levy payment will be ring-fenced in the form of an electronic voucher (digital account) that can be used to purchase training from approved training providers.
- The levy will give more control of apprenticeship funding to encourage the employment of more apprentices, or upskilling of the existing workforce.
- Apprenticeship targets have been set for both public and private sector organisations.
- The higher level apprenticeships have been given equal legal status as degree courses.
- HMRC will work closely with employers and providers of payroll services to minimise the burden of implementing these changes.

Exemptions from the levy - All employers with a payroll bill of over £3 million, on which there is a liability to pay secondary Class 1 National Insurance Contributions (NICs), will be required to pay the Apprenticeship Levy. There will be no exemptions.

Top-ups to the funds in digital accounts - The Government will apply a 10% top-up to the funds companies have for spending on apprenticeship training in England. That means for every £1 that enters an employer's digital account to spend in England on apprenticeship training, employers get £1.10.

Apprenticeships for SMEs - Employers with a payroll bill of less than £3 million will not pay the levy. The government will provide financial support for non-levy paying employers to take on apprenticeships, but these employers will be expected to make a small financial contribution of 10% of the cost of training and assessment in partnership with the Government.

Accessing the Apprenticeship Levy funding - Funds will be accessed through a new digital apprenticeship service account. Each company will need to register to create an account, and link it to their PAYE (pay as you earn HMRC) schemes. They will be able to see funds appear in their company's digital account monthly and be able to use this to pay for training and assessment of apprentices in England. The service will also help you find training providers and assessment organisations.

Time limit on levy funds - The levy funds expire 24 months after they enter an employer's digital apprenticeship service account unless they are spent on apprenticeship training. This will also apply to any top-ups in the account. Expiration will take place automatically, but the digital apprenticeship service account will inform employers in good time when any funds are due to expire so that the funds can be spent.

A recent document "Apprenticeship funding in England" From August 2018 (May 2018) gives detailed information about policy changes in England that will take effect wit 1st of August 2018

Summary of changes: This section describes policy changes that will take effect from 1 August 2018.

Funding Band Structure

We have reviewed the apprenticeship funding band structure to assess whether the existing 15-band structure supported employers in securing value for money.

We expect employers to negotiate prices with training providers, conscious of the fact that the upper band limit represents the maximum that government will contribute towards the apprenticeship and is not a fixed price. However, we have seen limited price negotiation in the market, with many employers telling us that they do not feel they are able to negotiate on price or that they consider the funding band upper limit to be the 'rate' set by government.

Following feedback from stakeholders, we have decided to introduce more funding bands in order to support negotiation between employers and providers on price.

Therefore, we are increasing the number of funding bands to 30, as set out in **Chapter 3**.

This funding band structure will take effect for new starts from August 2018 and we will allocate newly developed standards into the 30-band structure.

Existing standards and frameworks will be placed in the new structure at the same level as they have been under 15 funding bands. We keep all prices under review, with changes to frameworks only where there is strong supporting evidence. Apprenticeship standards are subject to regular review by the Institute for Apprenticeships and any future reviews will make recommendations on the appropriate funding level based on the new 30-band structure.

Transitional payments to providers training 16-18 year olds and additional payments in areas of disadvantage on frameworks

The current policy includes transitional measures, whereby providers training a 16-18 year old on a framework receive a further payment from Government equivalent to 20% of the funding band maximum, and providers also receive payments for training individuals from disadvantaged areas on frameworks.

We have seen starts on standards grow, which are generally funded at higher rates, but we know that many providers are still delivering substantial numbers of frameworks, including to 16-18 year olds. It is important that apprentices are still able to undertake these frameworks until the relevant standards are available.

As such, we will be continuing to provide a payment equivalent to 20% of the funding band maximum to providers training 16-18 year olds on frameworks, and additional payments to providers training individuals from disadvantaged areas on frameworks.

Additional payments for apprentices who require learning support

Our research found that some providers do not clearly understand when they can claim additional learning support. Providers might not be claiming for individuals who would benefit from support, and therefore may be reducing their chances of successfully completing the apprenticeship. We are therefore updating the funding rules to provide greater clarity on eligibility and the support available.

We also understand from research that some apprentices experience challenges with their mental health, which can prevent them from fully participating in their apprenticeship. Understanding of available support is also limited, and we will draw greater awareness to the 'Supporting Apprentices' mental health service, operated by Remploy on behalf of the Department for Work and Pensions, which provides a range of free advice and support.

Support for care leavers

Care leavers can experience extra barriers when making the transition to the world of work and we want apprenticeships to help them overcome those. These barriers can include particular financial hardship and living independently at a young age.

We are introducing a £1,000 bursary payment to support care leavers aged 16-24 starting an apprenticeship.

This bursary will help to meet the costs they incur as they transition into work and support them in the first year of their apprenticeship, when wages can be lower for some apprentices. We will pay this once to each care leaver in the eligible age range starting an apprenticeship, via their training provider.

Read more in https://www.apprenticeshipsdirectory.com/blog/apprenticeship-funding-band-structure---the-new-30-band-structure-for-funding-bands-came-into-effect-on-1-august-2018--1000

Share of company based training and in school based training

Each apprenticeship programme is different and varies in length. An apprenticeship programme can take between one and four years to complete, depending on the level of the programme, the apprentice's ability and the industry sector.

For example, an Intermediate Level 2 Apprenticeship usually takes around 12 to 18 months and an Advanced Level 3 Apprenticeship around 24 months.

If taken part-time, the programme will obviously increase in length, depending on how the apprentice's time is split.

Apprenticeship programmes must last for at least a year. An apprenticeship training agency/academy can be used if employers want to employ an apprentice without the responsibility for running the apprenticeship scheme.

Additional training

Apprenticeships have equivalent educational levels.

Name	Level	Equivalent educational level
Intermediate	2	GCSE
Advanced	3	A level
Higher	4,5,6 and 7	Foundation degree and above
Degree	6 and 7	Bachelor's or master's degree

For some apprenticeships the apprentice programme may need to combine work with study for an additional work-based qualification from GCSE (or equivalent)/diploma such as English and Maths, up to degree level.

Certification and accreditation

End-point assessment is an assessment of the knowledge, skills, learning standards and behaviours which the apprentice has learnt throughout an apprenticeship programme. The apprentice can't achieve an apprenticeship standard without satisfying all the requirements of their particular assessment plan, which includes the end-point assessment. An accredited organisation delivers the end-point assessment and although the employer/training establishment will be involved in arrangements for end-point assessment, the assessment itself must be independent of the employer.

The training provider must contract with the apprentice assessment organisation on the employer's behalf and have a written agreement in place with the apprentice assessment organisation to make payment to them for conducting the end-point assessment.

When the apprentice successfully completes their apprenticeship programme they will be awarded a certificate. The way they receive it depends on the type of apprenticeship they complete.

For apprenticeship standards the apprenticeship assessment organisation will request the certificate from the Education and Skills Funding Agency. For apprenticeship frameworks the training provider will apply for a certificate from the Federation for Industry Sector Skills & Standards.

Quality Assurance

There are two bodies with statutory duties for quality assessment: Ofsted and HEFCE. For a small section of apprenticeships, the statutory duties overlap. For these, Ofsted and HEFCE have agreed a joint approach. The table below details which bodies are responsible for assessment at the different levels.

Level 2-3 Ofsted	Level 4-5 Ofsted and HEFCE	Level 6-7 HEFCE
• Ofsted is responsible for inspecting the quality of apprenticeship training provision at level 2-3.	• Ofsted is responsible for inspecting the quality of apprenticeship training provision at level 4-5, unless the apprenticeship standard contains a prescribed HE qualification. • In the case of apprenticeship providers delivering prescribed HE as part of an apprenticeship standard, HEFCE and Ofsted will reach a judgement, informed by joint working, and this will be published.	• HEFCE conducts risk assessment through the Annual Provider Review and areas of concern may trigger investigation by the QAA. • If the standard does not contain a prescribed HE qualification, HEFCE/QAA retains responsibility.

Pathway into apprenticeships

Apprenticeships are not restricted to only young people and new recruits. Anyone can become an apprentice at any age and benefit from government funding to support their apprenticeship, whether they are already employed in your school or not, and whether they are full or part time, as long as:

- They are employed in a real job
- They are working towards achieving an approved apprenticeship (approved apprenticeships can be searched on the 'Find apprenticeship training' page of gov.uk)
- Their apprenticeship lasts at least 12 months

- They spend at least 20% of their time on off -the-job training (e.g. mentoring, coaching or completing formal training or qualifications)
- They are paid at least the relevant national minimum wage (though most will be paid more)

At any one time there are up to 28,000 apprenticeship vacancies available online in a variety of careers and industries across England. Anyone can access these through the Government's information Gov.uk, searching 'apprenticeships'. You can search by keyword (job role, occupation type or apprenticeship level) and by location. Once the right job comes up, you can simply register on the website and follow the step by step instructions to apply for the role. Their YouTube channel has useful hints and tips on applying plus other videos on apprenticeships, visit YouTube and search apprenticeships/NAS. And if not quite ready to start an apprenticeship, the Gov.uk website also details traineeships with a local employer to gain valuable work experience and the opportunity to improve English and maths, if needed.

Information, Advice and Guidance

HM Government UK has stated that its goal is for young people to see Apprenticeships as a high quality and prestigious path to successful careers and for these opportunities to be available across all sectors of education and the economy, in all parts of the country and at all levels.

This supports its aim for young people to get the best start in life, through the opportunity that high quality education and training provides. Their vision for 2020 sets out that:

- All young people at school will be able to hear from and be inspired by employers and current apprentices
- There will be clear progression routes through technical and professional education into skilled employment, including apprenticeships
- Traineeships will support more young people into apprenticeships and sustainable employment
- People from all backgrounds will get the preparation they need to be high quality candidates for apprenticeships

Schools have a statutory duty to ensure that all their year 8-13 pupils have access to independent careers guidance, including on apprenticeships.

3.5. Conclusions of the Comparison of Apprenticeship Systems

It is obvious that it is not easy to find a common picture of apprenticeship in the partner countries.

On the one hand, this is due to the fundamentally different traditions that exist in the countries AT, DE and in LT, UK with regard to the understanding of vocational training.

While apprentice training in AT and DE is based on a "occupational concept" based on consistent, compulsory occupational profiles for each profession, the apprentice VET training in the UK is more oriented towards a concept of accrediting acquired competences at different levels. In Lithuania, the development of dual education seems to be just developing a apprenticeship system that fits into the education and labour market system in Lithuania most VET programs are currently more school-based.

In addition, there are different strategies and concepts in the UK – in England, Wales, Scotland and Northern Ireland.

Although the concepts in AT and DE follow basically similar principles, the characteristics are quite different in some characteristics, for example in the transition system from initial school education to apprenticeship training, in the starting age of apprentices or in the proportion of apprentices who have completed secondary school with a high school diploma "Matura/Abitur".

Nevertheless, similarities can be recognized.

In particular, this concerns the preparatory area to interest young people in the school for apprenticeship training, especially for professions in the STEM area.

Furthermore, it is a matter of concern for all countries to motivate companies to train young people with the highest possible quality. In the meantime, this is less a quantitative challenge as there is a shortage of skilled workers in most STEM occupations. However, there remains the qualitative challenge of subject-specific education, which on the one hand motivates young people to choose an apprenticeship VET pathway but also to meet the current and future demands of the labor market and the company's working conditions.

Additionally, it is the concern of all countries to educate apprentices not only technically but also as a person in order to be able to meet the requirements of the working world in general and the requirements in the companies today and in the future.

This common interest will also be a key starting point for joint developments in project-oriented apprenticeship training

4.STEM – Demand and Strategies

4.1. Austria

Excerpt of the recent programm of the Austrian government concerning Digitalization and STEM

4.1.1. Common guiding principles

Guiding the way to the digital future

Over 100 experts from all ministries, the Länder (federal provinces), the Association of Cities and Towns, the Association of Municipalities, unions and employers' associations, and other organizations were involved in creating the Digital Roadmap. Subsequently, hundreds of citizens took part in an online consultation process. The resulting consultation paper forms the basis for the present Digital Roadmap Austria. The Roadmap provides an overview of the current challenges and of existing and planned measures and activities. These are based on twelve guiding principles for shaping the digitization process in Austria.

On this basis, the Digital Roadmap presents around 150 specific measures in twelve fields of action in order to ensure that Austria can optimally exploit the potential of digitization. The Roadmap brings together the activities of all government departments in a joint Federal Government strategy paper for the first time. With digitization changing our world at a rapid pace, the Digital Roadmap is also in a constant state of flux. It is a dynamic strategy paper that is continuously adapted to the latest developments in digitization, thus reliably guiding us all towards the digital future.

The 12 guiding principles of the Digital Roadmap:

1. Every person in Austria should be able to take part in digitization. We want to bridge the digital divide.
2. Digital education should begin as early as possible. No child should leave school without digital skills.
3. Basic and human rights apply in the digital world too. We want to strengthen digital individual responsibility and civic courage.
4. Internet access via a well-developed and affordable digital infrastructure is essential to both citizens and businesses in Austria and should be guaranteed.

5. We want to create more and better jobs through digitization and to educate and train people accordingly.
6. Digitization leads to new business and working models, for which we want to create a modern legal framework.
7. Our aim is for Austria to be one of the world's leading digital business locations. To this end, we must provide support to businesses for their digital transformation.
8. Science and research should be helped to develop new digital opportunities to ensure that Austria becomes an innovation leader in the future.
9. We will play an active role in shaping the European Digital Single Market.
10. We consider security in the digital sphere to be the joint responsibility of public institutions, business and citizens. Austria should continue to have high data protection standards.
11. We want to ensure and encourage a respectful online discussion culture and high-quality journalism in the digital world too.
12. The public sector also sees itself as a driving force for innovation in Austria. Citizens and businesses have the right to convenient, easy and accessible electronic communication with public administration.

Our path to the digital future

History has shown that technological change can be a powerful force for positive change processes in society. New technologies have always presented people with challenges, but have also expanded their possibilities, made their lives easier and made progress possible.

The Neolithic and industrial revolutions were the results of economic and social change made possible by technology, just as the invention of printing allowed science and world views to advance.

4.1.2. Digitization is part of everyday life

New opportunities

- New challenges
- Digital participation

- Digitization needs to be shaped
- More innovation through digitization
- The foundations of digitization
- Digitization as a question of attitudes and values
- Digital humanism and the democratization of knowledge
- Visions for Austria 2025
- Strategy: Digital Roadmap

Digitization is a cross-cutting political issue. In many fields and at various levels (e.g. government departments, regional authorities, unions and employers' associations, NGOs, business), strategies already exist that cover particular aspects of digitization and identify specific measures to be taken in order to support and manage the digital transformation. We now need a coordinated approach bringing together politics, administration, unions and employers' associations, business, science and research and also involving civil society. The Federal Government's Digital Roadmap is the foundation on which all further coordinated activities can be built.

„Our aim is to play an active role in shaping digital progress for citizens, businesses and the whole of society. Austria must remain economically successful and everyone should be able to share in this prosperity. Education, research and innovation combined with an efficient digital infrastructure are the prerequisites for Austria's path into the digital age. We have no time to lose. Let's get started together!"

Scenario 2025: What will be possible? 5G

The fifth generation of the mobile telecommunications standard is of major importance for mobile use of the Internet in future. Data rates of up to 10 GBit/s, low latency and a high density of connected end devices will enable a wide range of new business models and applications to be developed and will form the basis for the Internet of Things. Availability of the 5G infrastructure is therefore a high priority for the future development of Austria as a business location.

Internet of Things

In future, devices will make status information (e.g. current use, ageing, environmental conditions) available on the Internet and communicate with each other. Based on user requirements, devices can automatically provide support and make our lives easier. The industry benefits from improved maintenance of machinery since status information is automatically communicated. Devices on our bodies can communicate physical functions such as heartbeat and blood pressure and enable patients' health conditions to be medically monitored from a distance.

The Internet of Things is already reality: by 2020, there will be almost **three times as many devices** online as people.

Number of devices connected to the Internet worldwide, in billions

The Internet of Things also provides the basis for autonomous driving, i.e. the ability of cars to drive themselves using sensors. This enables completely new mobility concepts, more convenience for road users due to the linking of private and public transport, and less pollution as a result of smart/optimized driving. If the potential of self-driving vehicles is fully harnessed, 90% of accidents will be able to be prevented by 2025. At the same time, there is likely to be a dramatic reduction in the number of vehicles on the roads. People born today may never drive a car themselves.

Big data

The volume of data that we generate every day is no longer growing in a linear way, but exponentially. The amount of data currently available is too large and complex for it to be processed using conventional methods. The increased amount of information brings new opportunities, especially for the service sector and medicine, while the interlinking of large data sets enables completely new insights to be gained. New diagnostic methods make it possible to identify the genetic characteristics of diseases. This allows medicines and treatments to be developed that are precisely tailored to the patient's personal disease profile. At the same time, the production and use of ever increasing volumes of data bring new challenges when it comes to safeguarding privacy and data ownership.

2.5 exabytes of data are generated every day. **90% of all data** was created in the last two years.

Data traffic on the Internet in exabytes per month

Source: https://www.digitalroadmap.gv.at/en/

4.1.3. Dual education and immigration of qualified specialists to counteract the shortage of skilled personnel

The availability of qualified specialists plays an important role in international competition for investors. For this reason, the new Austrian government has defined the goal of further strengthening the internationally acclaimed dual education system and the **training of specialized staff**, e.g. by a stronger emphasis on MINT subjects (mathematics, information technology, natural sciences and technology) in schools. Furthermore, education and training should be more closely oriented to the needs of the business community, and the cooperation of Austrian schools, universities, companies and international educational facilities should be intensified by implementing joint education programs. The controlled immigration of qualified personnel is designed to give the Austrian labor market additional means to counteract the shortage of skilled employees.

Source: https://investinaustria.at/en/news/2017/12/government-program.php

The competent use of digital technologies and media is a key skill for participation in society, lifelong learning and increasing opportunities on the job market and thus also a prerequisite for preventing a digital divide. No child or young person should leave school without basic digital skills. Alongside technical abilities and knowledge about technology, a critical and reflective approach to technology must also be encouraged as part of media education. In addition, awareness of data protection and the responsible handling of data play a significant role. The ability to research and find information and to evaluate it critically is an important aspect of digital literacy. Digital education should be widely integrated into the curriculum in Austrian schools and should be taught as early as possible – in nurseries – and at the same time in an age-appropriate manner in order to sustain the enthusiasm and interest of children and young people.

A well-qualified workforce significantly increases the attractiveness of a business location. First, everyone should have basic digital skills; second, experts and specialists are needed in the science, technology, engineering and mathematics (STEM) fields in order to be able to compete in a global marketplace. Subject-specific education in schools should lead to qualifications that are relevant to the job market. The existing gender gap in the IT industry must be addressed and the representation of women in STEM fields increased.

Measures

- Consolidate existing initiatives and present a new overall digital strategy for schools in the first quarter of 2017
- Teach digital skills to school pupils in line with the digi.komp model and ensure that these skills are acquired via digi.check (see also http://www.digikomp.at/)
- Teach basic IT knowledge (coding, computational thinking) and encourage a fun approach to technology at primary school
- Encourage the reflective and responsible use of technology (media education, data protection, ethics) at school and provide hands-on programmes for adults to help them improve their media skills
- Strengthen subject-related and vocational training in key IT development areas such as network technology, business IT, commercial data processing and databases, digital business, computer engineering, media informatics and medical informatics
- Introduce special measures to increase the participation of girls and women in the digital and technical sectors

In line with the objective of providing the best education for everyone, digitization can be a crucial factor in opening up access to education. Linking 21st century technologies to modern teaching models will improve the quality of teaching and learning in education and training. To fully exploit the potential of digital media and tools, the education and training of teachers is a key factor. Well-prepared digital educational materials offer the opportunity for effective use. To this end, the ideal framework must also be created, e.g. in terms of network, hardware and software infrastructure. Fair and sustainable models that contribute to equal opportunities in education will be introduced to improve access to digital media, in particular for educational institutions and learners.

Source: https://www.digitalroadmap.gv.at/en/fields-of-action-and-measures/education/

4.2. Germany

In Deutschland gibt es vier wichtige überregionale Initiativen.2

Komm mach MINT

Das bundesweite Netzwerk zielt darauf, bereits in der Schule und bei der Berufsorientierung mehr Mädchen und junge Frauen für Karrieren in MINT-Berufen zu gewinnen. Das Netzwerk ist Bestandteil der Qualifizierungsinitiative der Bundesregierung.

MINT EC

Das nationale Excellence-Netzwerk für Schulen mit Sekundarstufe II und ausgeprägtem MINT-Profil stellt ein breites Veranstaltungs- und Förderangebot für die Schulen zur Verfügung. Dieses soll die Begeisterung für MINT sowohl bei Schülern als auch Lehrkräften steigern.

MINT Zukunft schaffen

Der Verein wurde von der Bundesvereinigung Deutscher Arbeitsgeberverbände und dem Bundesverband der Deutschen Industrie ins Leben gerufen. Ziel ist, die Karrierechancen für MINT-Talente in der deutschen Wirtschaft zu fördern und so dem MINT-Fachkräftemangel hierzulande entgegenzuwirken.

Nationales MINT-Forum

Der Zusammenschluss von mehr als 25 Institutionen unterstützt die Einzelinitiativen seiner Mitglieder zur Förderung der MINT-Bildung in Deutschland. Arbeitsgruppen entwickeln bildungspolitische Empfehlungen, branchenübergreifende Qualitätsstandards und gemeinsame Fördervorhaben.

[2] https://www.telekom-stiftung.de/projekte/mint-initiativen

There are four major supraregional initiatives in Germany.

Come do MINT

The nationwide network aims to attract more girls and young women for careers in MINT professions at school and in vocational guidance. The network is part of the Federal Government's qualification initiative.

MINT EC

The national Excellence Network for secondary schools with a distinctive STEM profile provides a wide range of events and funding opportunities for schools. This should increase the enthusiasm for MINT among students and teachers alike.

MINT Creating the future

The association was founded by the Federal Association of German Employers' Associations and the Federal Association of German Industry. The aim is to promote career opportunities for MINT talents in the German economy and thus counteract the lack of MINT specialists in Germany.

National MINT Forum

The association of more than 25 institutions supports the individual initiatives of its members to promote STEM education in Germany. Working groups develop educational policy recommendations, cross-industry quality standards and joint funding projects.

Regionale Initiative am Beispiel Mannheim

In Mannheim haben wir eine regionale MINT Initiative von fünf großen Ausbildugsunternehmen die einmal im Jahr in den Osterferien ein besonders attraktives Angebot zur Berufsorientierung in den MINT Berufen anbieten.

Die Unternehmen MVV Energie, John Deere, Roche, Heidelberger Druckmaschinen und Roche Diagnostics bieten ein fünftägiges MINT Praktikum an, bei dem Schülerinnen und Schüler der Klassenstufe neuen in jedem der fünf Unternehmen je einen MINT Ausbildungsberuf und einen MINT Studiengang vorgestellt bekommen. Das war als Beispiel im Jahr 2017 bei MVV Energie der Ausbildungsberuf des Elektronikers und der Studiengang Energiewirtschaft mit Vertiefung Erneuerbare Energien. Die anderen Unternehmen bieten jeweils andere Berufe an. Anhand praktischer Experimente erhalten die Schülerinnen und Schüler von Auszubildenden und Studenten praxisbezogene Einblicke in das jeweilige Berufsbild. Das Feedback der Schüler ist herausragend gut. Es gibt keine andere MINT

Initiative in Deutschland die in 5 Tagen eine solche Vielzahl an MINT Einblicken ermöglicht. Beriets aus dem ersten Jahrgang 2017 haben sich inzwischen viele der Schülerinnen und Schüler die nach Klasse 10 einen Ausbildungsplatz suchen bei unseren Unternehmen beworben.

Regional initiative at the example of Mannheim

In Mannheim, we have a regional MINT initiative of five large training companies that offer a particularly attractive range of vocational guidance in the MINT professions once a year during the Easter holidays.

The companies MVV Energie, John Deere, Roche, Heidelberger Druckmaschinen and Roche Diagnostics offer a five-day MINT internship, during which students in each of the five companies are presented with a MINT apprenticeship and a MINT course of study. In 2017, this was the example of MVV Energie's apprenticed profession as an electronics technician and the Energy Economics course with a specialisation in renewable energies. The other companies each offer different professions. By means of practical experiments, pupils of apprentices and students gain practical insights into the respective job description. The students' feedback is excellent. There is no other MINT initiative in Germany that offers such a multitude of MINT insights in 5 days. Beriets from the first class of 2017 have meanwhile applied to our companies many of the pupils who are looking for a training place after grade 10.

Preparatory work appendix 6 is here included

4.2.1. MINT (STEM) projects for apprentices in Germany and international projects

The following projects are be found in Germany, where apprentices make STEM projects.

Source: http://www.komm-mach-mint.de/MINT-Projekte/Projektlandkarte?text_search=&project_type=&institution=&audience=22425&field=&city_id=&submit=Ausw%C3%A4hlen

- https://www.fraunhofer.de/de/jobs-und-karriere/schueler/Nachwuchsprogramme/talent-schools.html
- https://www.lizzynet.de/wws/mintrelation-zukunftswerkstatt-technikberufe.php
- http://kompakt-ev.de/dienstleistungen/auszubildende-gewinnen/know-it/
- http://www.vitamint-online.de/
- http://www.womenofwindenergy.de/de/home.html

Wie hoch ist die Nachfrage nach MINT-Berufen in Ihrem Land? Welche Fähigkeiten sind in Zukunft im Hinblick auf die sich verändernde Arbeitswelt, insbesondere im Hinblick auf MINT, erforderlich?

Reference see WIKI: MINT - HERBSTREPORT 2017.

Im September 2017 waren in Deutschland 469.300 Stellen im MINT Berufen zu besetzen. Dies ist der bisher höchste Stand. Gegenüber 2016 entspricht das einer Zunahme um 17,9%.

Die Arbeitslosigkeit ist im gleichen Zeitraum um 10% auf jetzt 189.000 zurückgegangen. Das ist der niedrigste Stand seit Beginn der Aufzeichnungen (2011).

Die Lücke zwischen Angebot und Nachfrage liegt bei 290.900 zu Beschäftigenden und ist in nur einem Jahr um 43% gestiegen.

66% der MINT Lücke bestehen für Facharbeiter, Meister und Techniker. Entsprechend 34% für Akademische MINT Berufe.

Alleine nur bei den IT-Experten hat sich die Lücke in den letzten drei Jahren von 17.000 auf 37.000 verdoppelt.

Die Lücke wäre in Deutschland noch deutlich höher, würden nicht 118.000 Jobs durch ausländische Beschäftigte geschlossen. In fünf Jahren ist die Quote ausländischer Beschäftigter im MINT Bereich um 50% angestiegen.

Insbesondere in Richtung der Digitalisierung gibt es in Deutschland ein breites Ost zu Westgefälle.

Insgesamt mangelt es insbesondere an Hochschulen mit IT relevanten Studiengängen.

Für die Ausbildungsberufe im Metall und Elektrobereich wurden 2017 Zusatzqualifikationen definiert um die Kompetenzen für Digitalisierungsthemen zu stärken.

In September 2017,469,300 positions were vacant in the MINT professions in Germany. This is the highest level to date. This represents an increase of 17.9% compared to 2016.

Unemployment fell by 10% to 189,000 during the same period. This is the lowest level since records began (2011).

The gap between supply and demand is 290,900 to be employed and has risen by 43% in just one year.

66% of the MINT gap exists for skilled workers, foremen and technicians. Corresponding to 34% for academic MINT professions.

Only with regard to IT experts alone, the gap has doubled from 17,000 to 37,000 in the last three years.

The gap would be even greater in Germany if 118,000 jobs were not closed by foreign employees. In five years, the share of foreign employees in the STEM sector has risen by 50%.

Particularly in the direction of digitisation, there is a wide east to west divide in Germany.

Overall, there is a lack of universities with IT-relevant degree programmes.

In 2017, additional qualifications were defined for the training occupations in the metalworking and electrical engineering sectors in order to strengthen the competences for digitisation topics.

Siehe dazu auch Anhang 9 (Appendix 9).

See also Appendix 9 (Appendix 9).

Die Anzahl der Berufstätigen mit MINT Ausbildungsberufen im Alter zwischen 35-39 Jahr ist von 24% auf 20,5% gesunken. Dies entspricht einem relativen Rückgang um fast 20%. In der Altersgruppe von 30-34 Jahre ist ein Rückgang von 22,3% auf 18.8% zu verzeichnen. Das entspricht hier ca. 15% weniger Beschäftigten im MINT Bereich in dieser Altersgruppe.

Bei den MINT Studiengängen besitzt Deutschland mit 37% der Studierenden in MINT Berufen den höchsten Anteil in den OECD Staaten. Dabei muss allerdings berücksichtigt werden, dass in Deutschland die Studierendenquote insgesamt nur durchschnittlich hoch ist im Vergleich zu anderen OECD Ländern.

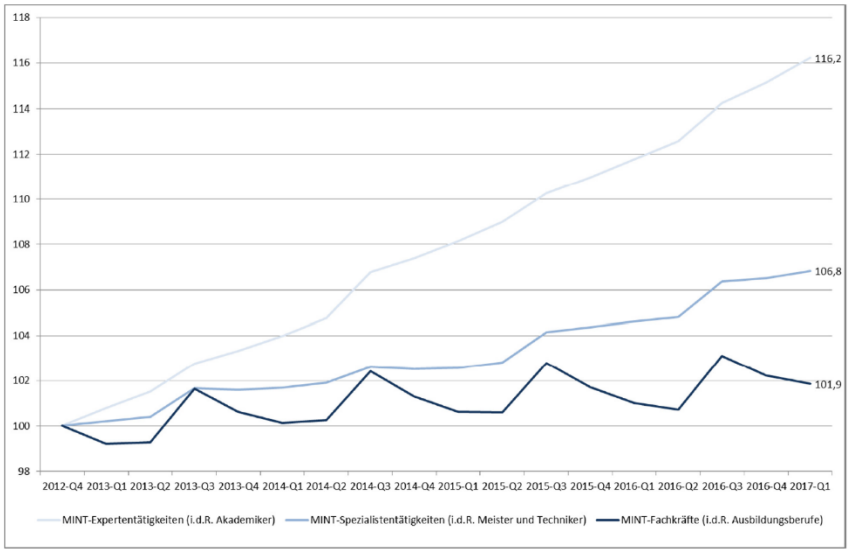
Am wichtigsten ist aktuell die MINT Förderung an Schulen. Hier gibt es sowohl in der Qualifikation des Lehrpersonals wir auch in der Ausstattung erheblichen Nachholbedarf.

The number of employed persons with MINT training occupations aged between 35-39 years decreased from 24% to 20.5%. This corresponds to a relative decline of almost 20%. In the 30-34 age group, there was a decline from 22.3% to 18.8%. This corresponds to about 15% fewer employees in the STEM sector in this age group.

Among the STEM degree programmes, Germany has the highest share of 37% of students in STEM occupations in the OECD countries. However, it must be borne in mind that the overall student rate in Germany is only on average high compared to other OECD countries.

Most important at the moment is the MINT support in schools. Here there is a considerable backlog in the qualification of teaching staff and equipment.

Abbildung 2-1: Beschäftigungsentwicklung nach MINT-Berufsaggregaten
Sozialversicherungspflichtig Beschäftigte; 2012-Q4 = 100



Quellen: Bundesagentur für Arbeit, 2017a; eigene Berechnungen

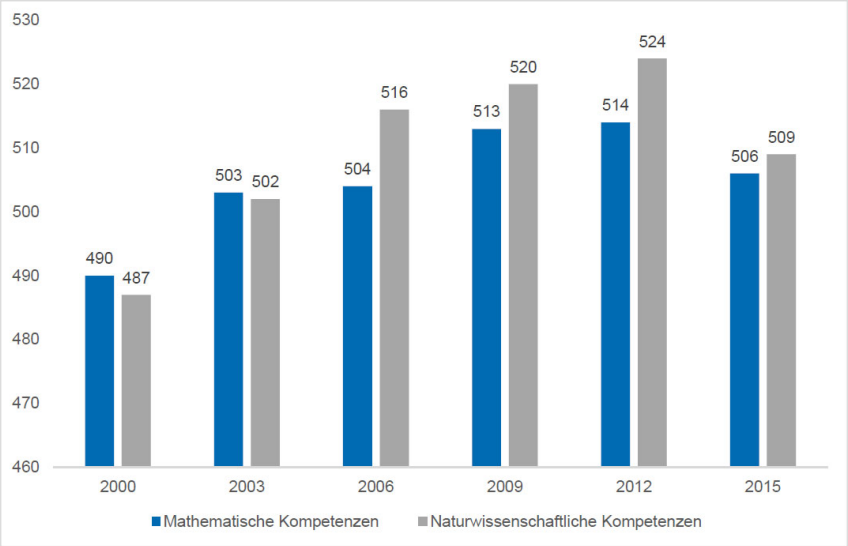
Die Abbildung zeigt deutliche Zuwächse bei Meistern und Technikern von fast 7% in 5 Jahren und überproportionale Zuwächse im akademischen Bereich mit 16%. Bei den Ausbildungsberufen hänen die geringen Zuwächse von knapp 2% auch zusammen mit der Mangelsituation auf dem Ausbildungsmarkt. In Baden Württemberg streben beispielsweise nur noch 25% der Schülerinnen und Schüler noch eine Ausbildung an. Vor 5 Jahren waren es noch über 40%.

The figure shows clear growth in the number of master craftsmen and technicians of almost 7% in 5 years and above-average growth in the academic sector with 16%. In the case of the training occupations, the low growth rates of just under 2% would also be seen in combination with the shortage situation on the training market. In Baden Württemberg, for example, only 25% of pupils are still looking for an apprenticeship. Five years ago it was over 40%.

Die MINT Kompetenzen der Schüler in Deutschland haben sich insgesamt verbessert, erreichen aber immer noch den angestrebten Zielwert von 540 Punkten.

The STEM competences of the pupils in Germany have improved overall, but still reach the target value of 540 points.

Abbildung 6-1: MINT-Kompetenzen in Deutschland
in PISA-Punkten



Quellen: Eigene Darstellung auf Basis von Klieme et al., 2010; PISA-Konsortium Deutschland, 2003, 2006; Prenzel et al., 2013; Stanat et al., o. J.; Reiss et al., 2016

Die Anhänge 2, 8 und 9 beschreiben die Kompetenzanforderungen und geben bereits einen Ausblick auf die Fördermöglichkeiten innerhalb eines Europäischen Talentprogrammes.

Anhang 8 und 9 sind eigenständige Anhänge und könne auch für den weiteren Verlauf des Innovationsprojektes Anwendung finden.

Appendices 2,8 and 9 describe the competence requirements and give an outlook on the funding opportunities within a European talent programme.

Appendices 8 and 9 are separate annexes and may also apply to the further course of the innovation project.

APPENDIX 2

Recommendations Industry 4.0

APPENDIX 8

The change of educational processes of vocational education in the course of demographic Change. A critical discussion, and why project based learning can be a solution for the future of apprenticeship education.

APPENDIX 9

Digitalisation in Germany and how it changes VET.

APPENDIX 10

Competences and Meta Competences and how to define a challenge.

Reference: „Gesamtmetall_VDAM_IG Metall-ZVEI Industrie 4.0 Handlungsempfehlungen zur Berufsbildung.pdf"

These recommendations have been incorporated into the partial amendment „Teilnovellierung" of the metalworking and electrical professions and will now be implemented as additional qualifications until August 2018 with the social partners in the German official training ordinances „Ausbildungsverordnung".

für die Metallberufe die Bereiche (for the metal professions)

- Systemintegration (System Integration)
- Prozessintegration (Process Integration)
- Additive Fertigungsverfahren (Additive manufactruing (3D printing)) für die Elektroberufe die Bereiche (fort he electrical professions)

- Digitale Vernetzung (digital networks)
- Programmierung (Programming)
- IT - Security

If we compare this with the Main activities of Electricians in Germany until today (2018) we see that we have a paradigm shift in the professions for the future from traditional work professions:

FROM (Main acitivties for Electricians profession in Germany today)

- Planning and organize
- Measure and Check
- Maintanance and repair
- Expand and improve
- Installation
- Manufacture
- Parameterize
- Testing
- Participate in Quality Management

TO (Minor acitivities upon today in Germany)

- Advice of customers
- Configuration of IT systems
- Software programming
- Operating
- Machining mechanical components
- Marking of mechanical components

4.3. Lithuania

Are there strategies for STEM in your Country? (e.g. on regional level, national level, from the point of view of education and / or economy etc...)

The acronym STEM includes nature sciences, technologies, engineering and mathematics. In the context of school education STEM includes the following disciplines:

- Nature sciences (biology, chemistry, physics, marine biology, environmental engineering, geology);
- Engineering (chemical engineering, civil engineering, computer engineering, electrical engineering (electronics), mechanical engineering, etc. engineering fields);
- Technologies (computer and information systems, game development, programming, online and software solutions, 3D modeling);
- Mathematics (mathematics, statistics).

The concept of STEM is recently changed to the STEAM concept it means that in addition to the aforementioned disciplines it includes the direction of art and design (STEM + Art/Design = STE(A)M). STEAM is the synthesis of precision sciences, nature sciences, technology, engineering science and arts + design.

Strategic goal for STEAM education (Lithuanian Ministry of Education and Science):

To increase pupils' interest in science, technology, engineering and mathematics and to develop the creativity, initiative of students and entrepreneurship competences in shaping the innovation culture in Lithuania.

The goals for STEAM education:

1. To improve students' achievements in STEAM.
2. To train teachers of the 21st century and to develop STEAM educators competences.
3. To promote public education and interest in STEAM topics.

https://www.upc.smm.lt/naujienos/bebras/konferencija2015/4-STEAM-ugdymo-Lietuvoje-aktualijos-SMM-Maryte-Skakauskiene.pdf

In order to make the science much more attractive the Lithuanian Ministry of Education and Science is establishing ten STEAM centers in the various municipalities of the country.

Interactive scientific centers will be established in ten cities of Lithuania. In these centers students will be able to get acquainted with the laws of various sciences and the latest inventions, to experiment and create themselves.

http://www.smm.lt/web/lt/pranesimai_spaudai/naujienos_1/10-yje-regionu-steigiami-steam-centrai-sudarys-lietuvos-moksleiviams-galimybes-is-arciau-susipazinti-su-mokslu

STEAM centers will also be able to train teachers, the researches and innovations will be delivered to the public.

It is planned that at each STEAM center there will be four laboratories: biology's and chemistry's, physics' and engineering's, robotics and information technologies' as well as specialized one corresponding to the specifics of a particular city.

The development of STEAM science centers is planned to be financed from the EU Structural Funds for the period 2014-2020.

According to the Lithuanian Ministries' of Education and Science concept to STEM it is predicted to develop competences of teachers in the area of STEM also to create and maintain a virtual STEM methodology center and to bring the best graduates to STEM pedagogical studies.

A Non-Degree Pedagogical Study Program focused on active learning principles and emphasizing the practical STEAM teaching principles will be prepared.

The STEAM Non-Degree Pedagogical Study Program will be prepared by Lithuanian University (-ies) in partnership with social partners applying the best methods for active teachers training and applying the best practices for teachers' qualifications upgrading.

The STEAM Non-Degree Pedagogical Study Program is dedicated for STEAM undergraduates, graduates or postgraduates also for those people who have got work experience or achievements in STEAM area but do not have a pedagogical background but who wish to gain a pedagogical qualification.

The STEAM network will be created. The STEAM network is a program linking regional human resources in the field of STEAM: schools, universities, various educational institutions, businesses, social partners, etc. The STEAM network will help to solve the problems of student's interest in STEAM issues and ensure cooperation between education and the labor market.

In 2017 Lithuanian government announced a list of workers whose lack was the greatest in the country:

1. Engineer of Manufactory's Organization
2. Printing Technologist
3. Engineer of Equipment's Maintenance
4. Sewing Technologist
5. Manufacturing Engineer
6. Aviation's Engineer
7. Engineer of Aviation's Mechanical Equipment
8. Mechanical Engineer
9. Constructor
10. Food and Drink Technologist
11. Avionics Engineer
12. Graphic Designer
13. Computer System Analyst
14. Business Information Technologies Consultant
15. Computer Systems' Consultant
16. Computer Systems' Designer
17. Computer Applications' Engineer
18. Computer Programmer
19. Programmer
20. Engineer Programmer
21. Software Tester
22. Database Administrator
23. Information Technologies Systems Administrator
24. Computer System Administrator
25. Network Analyst

26. Information Technology and Communications Security Specialist
27. Aviation Technician http://www.technologijos.lt/z/naudingi-patarimai/darbas/S-59845/straipsnis/Top-27-profesijos-kuriu-atstovu-Lietuvoje-truksta-labiausiai-situacija-kebli-ir-pilna-netiketumu

In 2020, the most necessary skills will be the ability to solve complex problems, critical thinking, creativity, human management and coordination of work. The engineers' remains one of the most popular professions but it is not enough to be just a good engineer: it is needed to grasp a bit about finance and social sciences in order combining these abilities the ones could successfully sell the products. Lithuanian employers want the engineers to learn foreign languages, be able to work in a team, be socially sensitive and understand human psychology and be able to offer suitable innovations to a rapidly aging and increasingly individualized society.

4.4. United Kingdom

STEM stands for science, technology, engineering and mathematics. In education, it means the study of these subjects, either exclusively or in combination. In employment, STEM refers to a job requiring the application of science, technology, engineering and mathematics skills or a qualification in a relevant subject, or located in a particular industry or sector. There is no universally accepted definition in either setting.

Since the early 2000s there has been growing concern, including from the UK government, about how to achieve higher productivity and economic growth in an era of rapid technological change. Over time, this has generated the widely held belief that one of the UK's key economic problems is a shortage of STEM skills in the workforce.

Most recently, the November 2017 policy paper, Industrial Strategy: Building a Britain fit for the future, stated that *"...we need to tackle particular shortages of STEM skills. These skills are important for a range of industries from manufacturing to the arts".* Some employers in STEM sectors have also suggested that exit from the European Union (EU) may affect the availability of people with the requisite STEM skills, but the precise impact is hard to predict.

People can develop formal STEM skills and knowledge in different ways, either in an educational setting or in the workplace. This can be seen as a 'pipeline', through which learners move in order to acquire more advanced abilities. The key routes for developing STEM knowledge and skills are:

- Schools and sixth-form colleges
- Further education colleges
- Apprenticeships, which mix work with formal off-the-job training
- Higher education institutions

Responsibility for developing STEM skills involves a number of government departments, and is embedded across a number of non-STEM specific policy areas.

The Department for Education (DfE) is responsible for the majority of STEM skills interventions. The Department for Business, Energy & Industrial Strategy (BEIS) has a cross-cutting role, including work on doctoral training and STEM inspiration and setting the national framework for science and technology. Other departments, including the Department for Digital, Culture, Media & Sport and the Ministry of Defence, run individual STEM-related programmes and initiatives.

Aside from the core teaching of STEM subjects, some of the most significant initiatives in terms of spending are:

- Providing higher education institutions with additional money to support their teaching of very high-cost STEM subjects
- Allocating capital funds to enhance higher education STEM teaching facilities
- Running university technical colleges, which were set up to offer 14- to 19-year-olds a combination of technical, practical, apprenticeship and academic learning

On a regional level, the STEM Plymouth Strategic Plan has been developed by Plymouth's private, public, military and third sectors and lays the foundations to 2022 to secure Plymouth's future and to support our region as the South West's STEM city. It is about building strength in our STEM economy, STEM education and STEM research in Britain's Ocean City.

As a specific focus within the overall Plan for Employment and Skills, the STEM Plymouth Strategic Plan is linked into our Plan for Education. These all sit below our Plymouth Plan to create a more prosperous city for all:

- To deliver a healthy and informed city of learning
- To strengthen Plymouth's role in the region
- To deliver Plymouth - the international city

There is tremendous effort in Plymouth to 'join up' our education, economy, heritage and culture to support the efforts of our employers, their employees and those developing their individual talents in all our schools and colleges, preparing for the world of work.

Our vision is that by 2031, we see Plymouth as a thriving, innovative international ocean city with science, technology, engineering and maths (STEM) driving the region's growth and productivity.

AIMS	OBJECTIVES
For Plymouth to succeed as a resilient and highly regarded STEM-driven economy that is cutting edge and prosperous.	Match STEM skills with demand to enable our STEM economy to **grow** and innovate with rigour, and **attract** STEM talent, thereby decreasing skills shortages.
For Plymouth's residents to have fair access to first class STEM training that meets economic need so that they can lead prosperous and independent lifestyles.	**Grow** and **keep** STEM talent in Plymouth to drive productivity across our city and our region, increasing the STEM pool.
For Plymouth to build on its STEM excellence to grow its economy and links nationally and internationally.	Promote and **attract** STEM excellence, increasing Plymouth's national and international standing.

We will GROW KEEP and ATTRACT STEM talent

The flexibility of the workforce is therefore critical for future development. Silo thinking in the traditional professions is no longer matching the required pace of change within STEM organisations. It is critical to develop transferable skills that can be used more generically - as well as across the STEM areas to ensure workforces can adapt to the STEM needs of Plymouth in the future.

STEM at City College Plymouth

The Regional Centre of Excellence for STEM opened in 2017 and is the most significant investment in Plymouth's skills infrastructure for many years. The Centre has already made a substantial impact on the training and education of STEM related subjects for the City and the wider region. City College Plymouth has invested in Plymouth's future and supports the region's strategies for

growth and prosperity. Together with the support of Plymouth's private, public, military and third sector, a ladder of opportunity for the wider community has been created, enabling individuals to progress further in learning and then into sustained higher-level employment.

4.5. Conclusions of the Comparison of STEM – Demand and Strategies

In all partner countries strategies and programmes exist to improve and to strengthen STEM activities, STEM education in general and, too, in dual or work based education programmes.

Despite all different conditions and varieties in the partner countries, in all partner countries, some common challenges are visible

- to interest young people early in elementary school education for STEM topics,
- to motivate them to receive vocational training in the company, then
- to provide them with the best possible technical STEM training,
- to educate apprentices personally, attitudes, habits, and personal skills and
- to prepare them for lifelong learning in a rapidly changing working world

Programs and products developed in the EATAP project should take into account all these challenges.

The respective national framework conditions have to be considered as well as the interests and possibilities of the companies to implement measures.

Industry 4.0, Digitalization, should be used as leverage to increase the attractivity of STEM occupations and the motivation for youth – and their parents - to choose such occupational VET pathways.

Project-orientated apprenticeship VET programmes could contribute to this approach. But, it should be seen more as a integrative part of a comprehensive model of apprentice STEM programme than an isolated educational methodology.

Any concept should combine IT, engeneering, technical contents with elements of development of personal skills and competences.

In that sense, project orientated apprenticeship education could be a core element of a innovative, excellence targeted apprenticeship VET progamme.

5. Project based learning

5.1. Austria

Most of the company business is also conducted project based, therefore it can be said that project based working/learning is part of everyday business in AVL. Many of the courses at AVL Academy, which provides the additional training for the employees, are also conducted in line with a project based learning method.

In the course of the additional training courses "Time Management I, II and III" the apprentices have to work on projects in agreement with the project based learning theory. After 2 days (Time Management I & II) of theoretical input, the apprentices have until the end of their 3rd year of apprenticeship to work on different projects. During "Time Management III" the apprentices get the opportunity to present their project in front of the group and the head of the department. For a detailed description see table 2.

Learning Area	Time Management
Create Skill	Self-Management / Teamwork
Driving question	How can you in the best possible way present your topic to another AVL employee?
Final product	To develop a brochure or visualization of your topic plus a presentation
Detailed information	The project allows the apprentices to think about different topics (for example Time and Self-Management, learning techniques, Industry 4.0, or any other topic the apprentices want to work on) and think about how to in the best possible way present their project to another AVL employee.
Skills	Time Management, Communication, Teamwork, Emotional Intelligence, Project Management, Self-Organization

Table 2.: Detailed description of the course(s) "Time Management I, II & 3" and the overall aim.

Picture 1.: Visualisation of a typical workpiece (dovetail joint) in the first year of AVL technical apprentices.

5.2. Germany

The definition of project based learning

HJM See Master Thesis Hans-Joachim Appendix 8

Eine moderne Umsetzung eines Projektrahmens in Form einer Herausforderung beschreibt Anhang 10. Hierbei sind auch agile Methoden berücksichtigt und beschrieben.

A modern implementation of a project framework in the form of a challenge is described in Appendix 10, which also takes into account and describes agile methods.

The understanding of project based learning in the own organisation

Siehe gesonderte Dokumentation zur Talentgruppe MVV Energie AG.

See separate documentation on the talent group MVV Energie AG.

5.3. Lithuania

The definition of project based learning

Project Based Learning is a method using which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge. Project based learning is a method using which the students together with the help of a teacher learn how to analyze and solve complex of problems. It is a teaching and training activity the result of which is the understanding of the problem and giving the proposal for its solution. Strategic thinking, teamwork and analytical skills are developed using project based learning. This method helps to develop the skills necessary for practical work, links the theoretical elements with practical activities.

The understanding of project based learning in the own organisation

The project based learning is widely used in engineering, technological, information technologies studies. All the final papers are prepared in accordance of project based learning. Business companies and other organisations offer contracts for various research works carried out by academic staff during visits and/or students during their training. Topics of the external final works are being formulated taking into account the relevant events in the Klaipėda Region and the needs of the Klaipėda City and Region.

There are four business practical training firms (BPTF) in our university. It is a virtual company that runs like a real business, silhouetting a real firm's business procedures, products and services. In a Practice Enterprise, trainees/ students/clients are trained in a work-based environment. The integrated environment allows learning to occur as a natural part of the day-to-day activities. The students/trainees/clients do not pour over books studying the principles of business theory; they conduct real commercial business with other Practice Enterprises within the network conforming to accepted business practices and frameworks.

The participants are employees of a company, having to apply for a position in the company via Human Resources, receiving an induction program, training schedule, contract of employment, job description, and departmental duties. They rotate around the organization enhancing their practical knowledge of the various departmental procedures, systems, operations and targets, learning by doing the job functions.

Lots of project based learning activities are done in BPTF: preparation and participating in international fairs, preparation and realization of business ideas, participation in business ideas competition, preparation and participation in business event "Profadienis" – it's a day for meeting business professionals and students: this is a unique opportunity for students to get acquainted with business practices in solving their business tasks.

All the firms have been awarded with EUROPEN certificates certifying conformity of the BPTF facilities and academic staff with the EUROPEN requirements. While on practice at a BPTF, students learn the main principles of entrepreneurship necessary to work in a real company, get to know the most innovative information technologies, software used at business companies, etc. Having completed a practice in a certified BPTF and presenting a report in conformity to the EUROPEN requirements, students are awarded with EUROPEN quality certificates recognised across 42 countries worldwide.

What is changing from the classical project based learning to modern methods for project based learning?

Project-based learning has captured the world's attention as it is emerging as a powerful pedagogy for teaching these critical 21st century skills:

- Significant Content -At its core, the project is focused on teaching students important knowledge and skills, derived from standards and key concepts at the heart of academic subjects.
- 21st Century Competencies -Students build competencies valuable for today's world, such as problem solving, critical thinking, collaboration, communication, and creativity/innovation, which are explicitly taught and assessed.
- In-Depth Inquiry - Students are engaged in an extended, rigorous process of asking questions, using resources, and developing answers.
- Driving Question - Project work is focused by an open-ended question that students understand and find intriguing, which captures their task or frames their exploration.
- Need to Know - Students see the need to gain knowledge, understand concepts, and apply skills in order to answer the Driving Question and create project products, beginning with an Entry Event that generates interest and curiosity.
- Voice and Choice - Students are allowed to make some choices about the products to be created, how they work, and how they use their time, guided by the teacher and depending on age level and PBL experience.
- Critique and Revision - The project includes processes for students to give and receive feedback on the quality of their work, leading them to make revisions or conduct further inquiry.
- Public Audience - Students present their work to an audience, beyond their own classmates and teacher.

5.4. United Kingdom

5.4.1. The definition of project based learning

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to authentic, engaging and complex questions, problems, or challenges.

A curriculum is built that combines a strong mix of academic, vocational and sector specific professional qualifications to maximise future progression opportunities, this is structured around core project based learning, work experiences and specific identified skills, to create a combined curriculum. Employer involvement is maintained and they actively engage in the delivery of curriculum through project based learning and enrichment activities, as well as providing work experience opportunities.

A PBL model requires high level, constant planning and mapping to core curriculum (of GCSEs, BTECs, AS/A2 and Work Skills qualifications), however this brings significant benefits through increased student engagement, motivation and achievement of learning outcomes.

The understanding of project based learning in the own organisation

The post-16 curriculum continues to challenge and stretch students, extending their experiences in the work place and building their CVs. This gives the flexibility to be creative and ambitious in setting individual targets for each student whilst building their full curriculum at the start of term and also to adapt it during the academic year, as students develop and grow.

Timetables are built whilst extending their work based and professional qualifications. This curriculum facilitates progression into further vocational learning (HNC, Foundation Degree), university education and advanced apprenticeships as well as fully preparing students to enter the workplace full time.

A PBL model requires high level, constant planning and mapping to the core curriculum but this brings significant benefits through increased student engagement, motivation and achievement of learning outcomes.

Learning and projects are delivered during timetabled PBL sessions and enhanced via group coaching sessions, enrichment activities and one-off events. Examples of PBL projects are included:

Project Brief - Tourism and Leisure

Learning area:	**Transforming my Community**
Create skill	Thinking

Driving question:	How can Plymouth increase tourism (targeting both national and international tourists) during the winter season?
Area:	Plymouth, Devon
Final product:	To develop a product or service (possibly Digital) that would market Plymouth as a destination of choice in the winter
Detailed information:	This project allows students to think about seasonality and the impact tourism has on the economy. Students will investigate who currently comes to Plymouth for their holiday, where they are from and find out why they are here and how they found out about Plymouth. Students will then build on this and identify key tourist attractions available in Plymouth and produce a product that will open up Plymouth as a destination of choice, possibly online or in hard copy.
Module 1 - Area of learning: Communicating with Others	
Driving Question: What are the main issues surrounding tourism in Plymouth in the winter?	
Overview: Students will investigate what information is currently available for prospective tourists (both national and international students) if they want to visit Plymouth in the winter. They will find out what is available and open and are numbers of tourists significantly less in winter. If so, why is this?	
End Product: A report will be compiled listing the reasons why Plymouth has a limited number of tourists in the winter. This report will be discussed in a forum environment with Destination Plymouth.	
Key CREATE skills: Communicate (select, organise), Relating to Others (relate, collaborate), Applied (wider world, local community), Emotional Intelligence (understanding others)	
Map to curriculum: Foreign Languages, English, Computer Science	

Project Brief - Sport

Learning area:	**Leading Healthy Lifestyles**
Create skill	Emotional Intelligence
Driving question:	How can we increase young people aged between 14 – 24 to regularly participate in exercise?
Area:	Plymouth, Devon
Final product:	To develop a sports plan specifically tailored to young people aged 18 – 24.
Detailed information:	Students will investigate how young people can better engage in sport by understanding current activity carried out and patterns emerging in terms of popular sports, specific locations. Students will also understand barriers to sport engagement and think of ways to overcome these. Students will then produce a plan of activity and sports events for young people and monitor activity. Students will liaise with the 3 local professional sports clubs and education providers.
Module 6 - Area of learning: Transforming my Community/Enterprising and Creative Behaviour	
Driving Question: Have I developed a sports plan that engages young people in sport?	
Overview: Students plan, design and launch their sports plan and monitor if activities have successfully increased the number of young people in sporting activities	
End Product: A timetable of sporting activities that are being delivered across the city that young people can attend.	
Key CREATE skills: Enterprise (launch, plan, execute), Applied (local community), Emotional Intelligence (Managing others), Relating to Others (Collaborate)	
Map to curriculum: Business, Maths, English, Science	

5.5. Conclusions of the Comparison of project based learning

This section should be top of agenda for common discourse to develop models and programmes for excellence training offers in project based learning, based on contents, outcomes and conclusions of this comparison.

See also first suggestions in Chapter 7 "Concept…"

6. Provision in International Programmes

6.1. Austria

People in initial vocational education: The European programme Erasmus+ provides financial support options for pupils at schools of vocational education who want to gain experience abroad at a comparable institution. This also applies to apprentices who want to do part of their training at a company in another European country.

School leavers and apprentices who have completed their apprenticeship can apply for financial support within the framework of Erasmus+ provided that they complete their internship abroad within one year of completing their school education or their apprenticeship.

Specialists in vocational education and training, e.g. teachers and trainers as well as career counsellors and personnel managers in companies can apply for funded stays abroad for vocational further education and training in the form of teaching assignments, job shadowing, etc.

Vocational education and training institutions can submit innovative project ideas in Erasmus+; the exchange of good practice between them can also be funded. European project partners – e.g. educational institutions, companies, social partners, authorities, research institutions, etc. – will for example develop new curricula together. In this way e.g. a virtual platform to document the work of dance instructors, courses for teachers and trainers who want to prevent young people from dropping out of their education or training, or materials to facilitate access of deaf youngsters to the labour market will be developed with participation of Austrian institutions.

Source: https://oead.at/en/outgoing/vocational-education-and-training/

Mobility projects in Erasmus+ support study and training periods abroad in general education and vocational education and training. The aim is to achieve positive and sustainable effects for the participants and the participating organisations.

This is the sub-programme with the highest budget within the Erasmus+ programme: From 2014 to 2020 the European Union wants to support up to five million stays abroad throughout Europe.

In Austria alone some 14,000 people become mobile by means of Erasmus+ every year.

Institutions working in the field of education can submit mobility projects. The projects support the mobility of learners, teachers and staff at educational institutions.

It has been proved that education-related stays abroad contribute to an improvement of people's vocational, social and foreign language abilities and skills. The experience gained not only enriches people on the personal level but also enters educational institutions and the labour market. It contributes to internationalisation, an increase in quality and innovation of the national education systems.

Students can spend part of their studies or do an internship in another European country by means of Erasmus+. Graduates as well as pupils in initial vocational education and apprentices also have the possibility to do on-the-job training abroad. Teachers and staff of educational institutions of all educational sectors can benefit from further education activities abroad or teach abroad for a certain period of time. International mobility in higher education to and from partner countries worldwide as well as "Erasmus Mundus Joint Master's Degrees" are also supported.

- Erasmus+ mobility projects in school education (for (nursery school) teachers, teachers and other educational staff at schools)
- **Erasmus+ mobility projects in vocational education and training (for people in initial vocational education and training and specialists in vocational education and training)**
- Erasmus+ mobility projects in higher education (for students, graduates, lecturers and staff at higher education institutions)
- Erasmus+ mobility projects in adult education (for adult educators and other adult education staff)

Source: https://oead.at/en/projects/mobility-projects-in-erasmus/European Vocational Skills Week 2018

The 3rd European Vocational Skills Week will be organised in Vienna, Austria, from 5 to 9 November 2018. This was announced by Commissioner Thyssen at the closing Ceremony of the 2017 Week on 24 November 2017.
In addition to the events to be organised by the European Commission and the Austrian presidency, national, regional and local events will take place associated with the Week.

Based on the growing level of interest from all stakeholders in 2016 and 2017, we hope that the EVSW 2018 will reach out to an even higher number of learners (young and adults), parents, big enterprises, SMEs, chambers, VET centres, schools, guidance services, social partners and other stakeholders.

Stay tuned for regular news, updates, announcements and start of registration for local, regional and national events and activities. You can also join in on all the action on twitter #DiscoverYourTalent or #EUVocationalSkills.IFA

The IFA association was established in 1995 as a service center to promote the mobility of skilled workers. Members include all the Austrian Economic Chambers, the Federation of Austrian Industries, the Junior Chamber Austria and Junior Industry.

Today, IFA is the leading organization when it comes to international work experience. As a focal point for information and consulting for young people, businesses and educational institutions, IFA organizes work placements abroad, applies for and assigns the necessary funding and ensures the skills acquired abroad are recognized in Austria.

IFA specializes in assisting non-academics and provides approximately 600 apprentices, students from vocational schools, skilled workers and trainers with the opportunity to complete a work placement abroad.

6.1.1. Our fields of activity

- We organize work placements abroad for apprentices.
- We help interested individuals plan their work placements abroad.
- We help companies and vocational schools to establish and implement exchange programs.
- We support young people and adults from other EU countries who wish to do a work placement in Austria.
- We promote the mobility of talented and dedicated apprentices and apprenticeship graduates (Grant for Gifted Students from the Austrian Economic Chambers and the Federal Ministry of Science, Research and Economics).

Each year, 2,000 young people, 150 businesses, schools and other educational institutions take advantage of our services.

6.1.2. Why are work placements abroad so important?

Companies expect their employees to be mobile, flexible and to have international experience. Work placements abroad are the best way to improve your linguistic, professional and intercultural skills. You can count on IFA – Your partner for mobility!

All the work placements organized by IFA are paid for with funds from the EU or Austria.

Source: https://ifa.or.at/en/about/

6.2. Germany

International Vocational competitions

- https://www.worldskillsgermany.com/

Sample for the waste water sector available (Dubai 2017)

Es gibt in Deutschland neben dem bekannten ERASMUS+ Programm der Europäischen Union weitere Programme. Einen Schwerpunkt bilden hier Angebote oft regionale Industrie- und Handelskammern. Siehe dazu auch:

Apart from the well-known ERASMUS+ programme of the European Union, there are other programmes in Germany. One of the focal points here are often regional chambers of commerce and industry. See also:

https://www.dihk.de/themenfelder/aus-und-weiterbildung/bildung-international/auslandsaufenthalte-waehrend-der-ausbildung/wie-azubis-ins-ausland-kommen

Eine weitere Institution die aber mit Fördergeldern aus dem ERASMUS+ arbeitet ist:

Another institution that works with ERASMUS+ grants:

http://www.goforeurope.de/info-unternehmen.html

Eine Veröffentlichung der nationalen Agentur im BibB zeigt die Akzeptanz der Internationalen Programme im Vergleich Deutschland zu den anderen Staaten.

A publication by the national agency in the BibB shows the acceptance of the International Programmes in comparison with other countries.

The following figures are originally from:

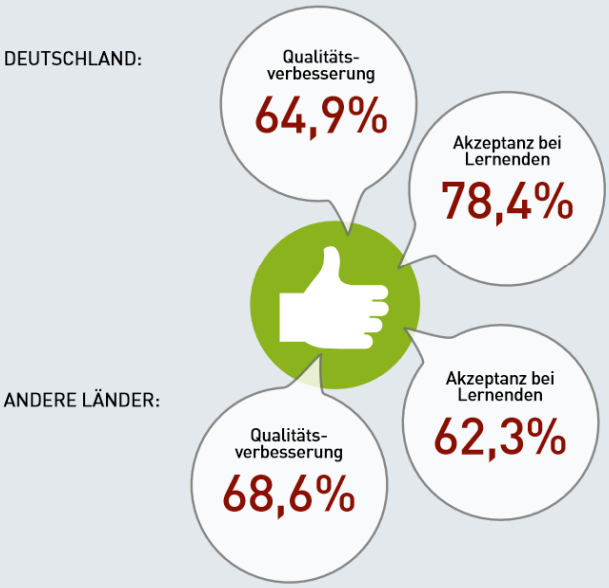
https://www.na-bibb.de/fileadmin/user_upload/na-bibb.de/Dokumente/06_Metanavigation/02_Service/Publikationen_Warenkorb/NA-Journal27_Web.pdf

Erfahrungen mit der Nutzung der Projektergebnisse

Ergebnisse als sinnvolle Ergänzung zur bisherigen Aus- und Weiterbildung

DE: n=37 Andere Länder: n=35

Projekte verbesserten die Qualität der beruflichen Weiterbildung und stoßen auf große Akzeptanz bei den Lernenden

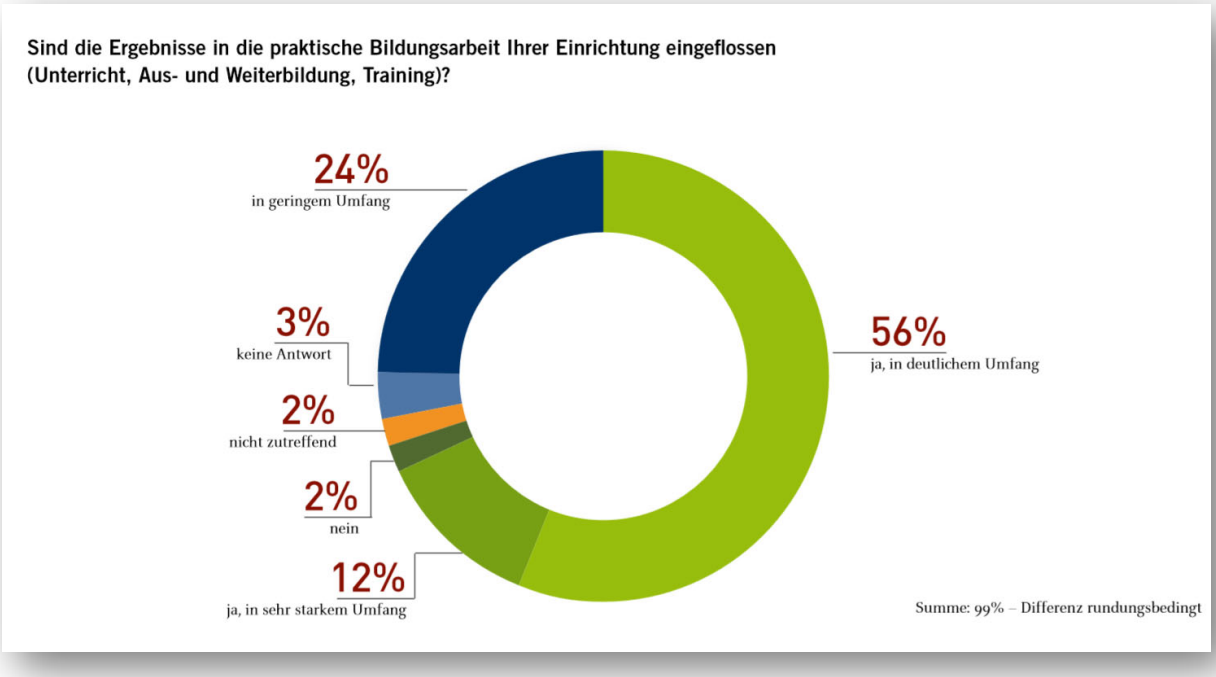


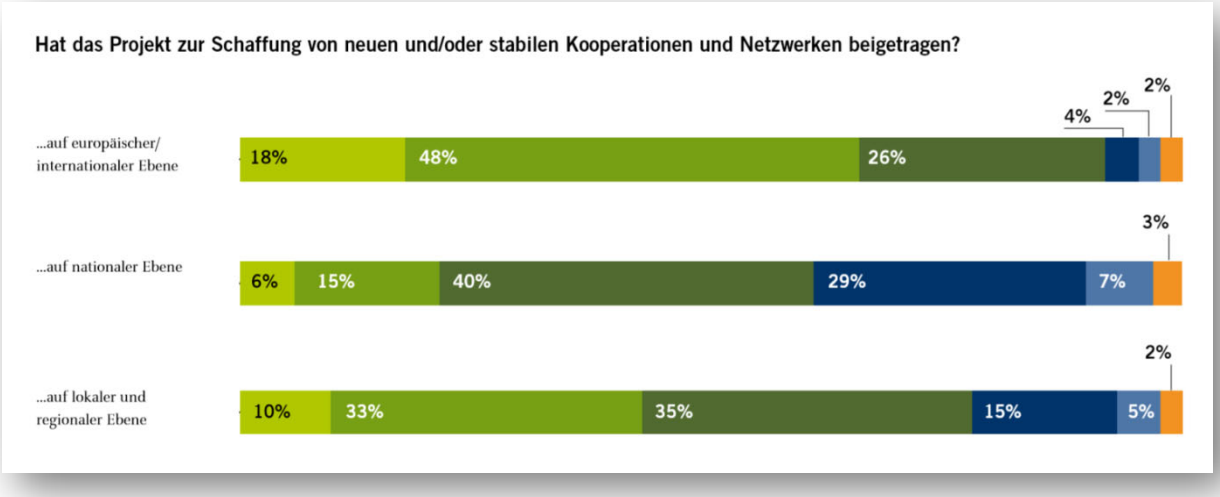
DE: n=37 Andere Länder: n=35

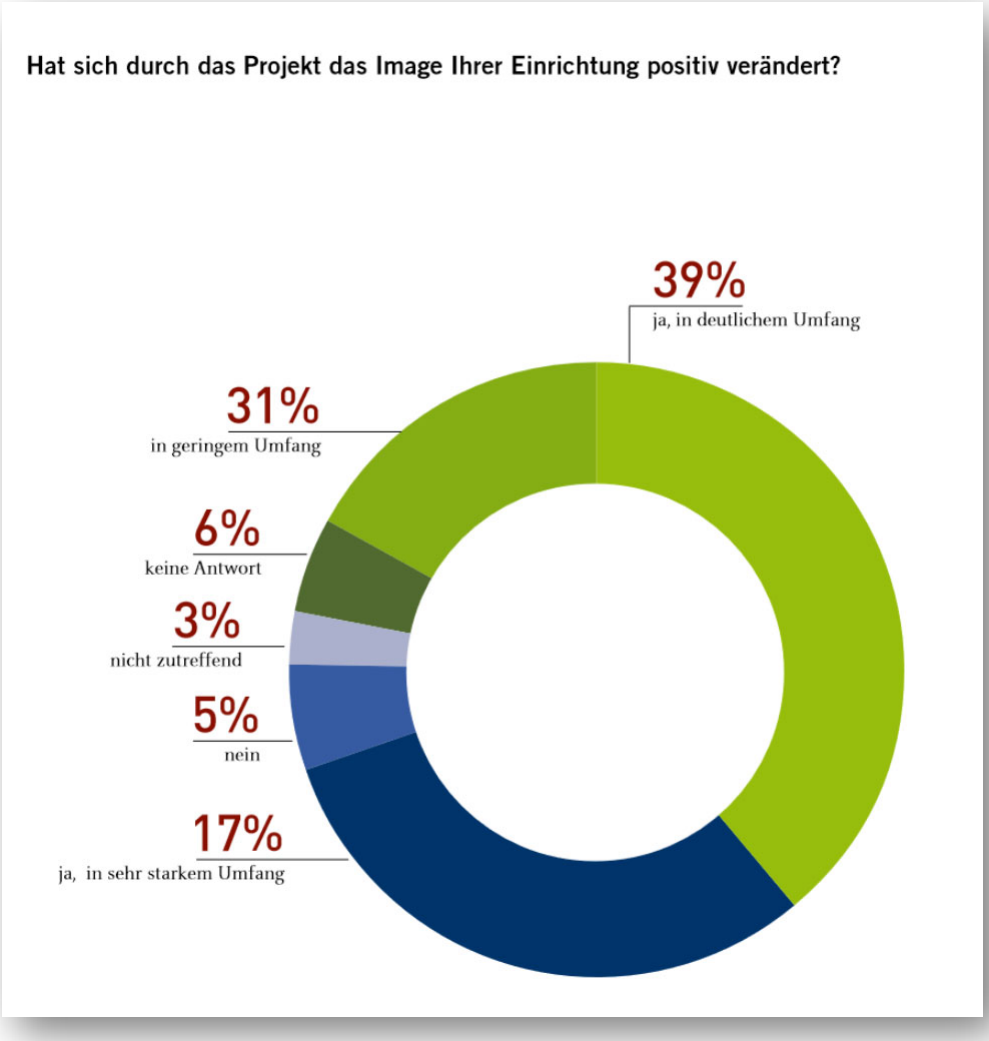
Die nachfolgenden Good-Practice-Projekte 1 und 4 sind Beispiele für die offizielle Anerkennung der Projektergebnisse im Bildungssystem; die Beispiele 2 und 3 zeigen die Qualitätserhöhung der beruflichen Weiterbildung.

Anfang 2017 wurden 702 deutsche Einrichtungen in einer Online-Befragung zu den Ergebnissen und Auswirkungen der Erasmus+-Projekte des Programmjahres 2014 angesprochen. Die adressierten Organisationen repräsentierten alle deutschen Projektträger der Leitaktion 1/Mobilität (n = 458), alle deutschen Projektträger der Leitaktion 2/Strategische Partnerschaften (n = 66) sowie die deutschen Einrichtungen, die als Konsortialpartner an einer von einer ausländischen Einrichtung koordinierten Strategischen Partnerschaft im Bereich der Berufsbildung oder Erwachsenenbildung beteiligt waren (n = 178).

At the beginning of 2017,702 German institutions were addressed in an online survey on the results and effects of the Erasmus+ projects in 2014. The organisations addressed represented all German project promoters of Key Action 1/Mobility (n = 458), all German project promoters of Key Action 2/Strategic Partnerships (n = 66) and German institutions that were involved as consortium partners in a Strategic Partnership in the field of VET or adult education and training coordinated by a foreign institution (n = 178).




Hat das Projekt zur Schaffung von neuen und/oder stabilen Kooperationen und Netzwerken beigetragen?
...auf europäischer/ internationaler Ebene
18%
48%
26%
4%
2%
2%
...auf nationaler Ebene
6%
15%
40%
29%
7%
3%
...auf lokaler und regionaler Ebene
10%
33%
35%
15%
5%
2%


Hat sich durch das Projekt das Image Ihrer Einrichtung positiv verändert?
39%
ja, in deutlichem Umfang
31%
in geringem Umfang
6%
keine Antwort
3%
nicht zutreffend
5%
nein
17%
ja, in sehr starkem Umfang

6.3. Lithuania

In many countries, clusters promote economic growth and employment. Clusters attract new technologies, qualified personnel, and investment in research. Co-operation between groups of enterprises, which allows reducing the cost of acquiring knowledge or technologies, creates more learning opportunities, allows the allocation of risk and costs of research and applied activities, encourages flexibility, and also helps to reduce the time of leading new products or processes to the market is becoming an increasingly important condition of succeeding in competition.

At present time, 46 cluster initiatives are identified in Lithuania. Some of them are still at the embryonic stage or are presented only by groups of enterprises whose gathering was sparked by the desire to take advantage of the EU structural funds. Only a quarter of the identified clusters are being formed naturally, in developing new products or services through long-term co-operation and seeking to gain a bigger market share, thus enhancing the overall competitive ability of the cluster enterprises.

The fields to which cluster participants direct their activities:

- Information and communications
- Co-operation
- **Training and qualification improvement**
- Innovations and technologies
- Common pricing policy
- International development and partnership with other clusters
- Lobbyism

http://klaster.lt/en/apzvalga/

Baltic Council for International Education is a leading education abroad agency in the Baltics offering a variety of study abroad programmes - from language courses and summer camps to secondary and higher education. Baltic Council is an organiser of the biggest education abroad fairs in Latvia, Lithuania and Estonia - Days of International Education and Days of British Education.

http://www.balticcouncil.org/en/sakums/

In a frame of Erasmus + project "Welder Training Quality development" an international welding training program and material were prepared.

http://www.emokymas.eu/english/

The Duke of Edinburgh's International Award (DofE awards) is worldwide known youth training program that educates responsible citizens and provides hands-on skills.

https://www.dofe.lt/lt/about-us/

No any provisions for apprentices to join European or international programs in Lithuania.

The added value of international programs can be seen from a variety of different perspectives of stakeholders. From schoolchildren and vocational schools perspectives the added value of international programs is higher quality of education; the recognition of achieved learning outcomes during mobility; improved quality of international mobility through partnerships. From the perspective of labour market organizations International programs helps to reduce the lack between educational supply and labour market needs.

6.4. United Kingdom

City College Plymouth (CCP) is leading the way in the innovation and internationalisation of Apprenticeships with a new €250K talent programme. With over thirty years of experience in delivering award-winning Apprenticeships, the College is spearheading a European partnership of Apprenticeship educators and private companies to design an innovative 'talent programme' for Higher Apprenticeships in STEM (science, technology, engineering and maths) sectors in order to stretch and challenge high-performing trainees.

The 'European Apprenticeship Talent Programme' (EATAP) is funded by the European Union's Erasmus+ initiative and builds on the College's experience of sharing best training practices across borders. Joining the College in this endeavour are training providers and companies who offer Apprenticeships from Germany, Austria and Lithuania, as well as representatives from Plymouth City Council.

Fiona Horrell, Head of Strategic Partnerships at the College, said: "Most people know that an Apprenticeship lets you 'earn while you learn' but not everyone realises the doors they can open for people to experience global markets. When the EATAP project team meet this summer in Germany, we will be looking at how best to promote this to potential apprentices, employers and training providers."

European work placements offer fantastic, funded opportunities for employers and for apprentices. The world of work is competitive and Erasmus+ placements offer a great way to give apprentices the dynamism an organisation needs – pushing them beyond traditional skill sets and enhancing their training and skills which employer organisations can benefit from.

Organisations including major motor manufacturers, further education colleges and Trailblazer universities are already sending their apprentices on funded work placements with a European partner lasting between 2 weeks to 12 months; enhancing their

apprenticeship and traineeship offerings through unique practices and cutting edge innovations.

These organisations and others across the UK are seeing the impact Erasmus+ can have on their organisation and learners. The booklet showcases just some of these examples and explains how you could be one of them.

6.5. Conclusions of Provision of International Programmes

A) In the countries

B) Provided by EU or international – for the countries

Existing Evaluation show positive effects of the use of European/international programmes.

Some partner countries have less experience and less provision of international cooperation in VET apprenticeship.

Currently a call of CEDEFOP is open for a comparative study concerning European cooperation activities concerning apprentices (with focus mobility), it seems, that is an interesting topic not enough evaluated yet.

So the chance and opportunity within EATAP is given to contribute to that topic through exchange of experience between the partners and develop new approaches concerning the aims and objectives of this project.

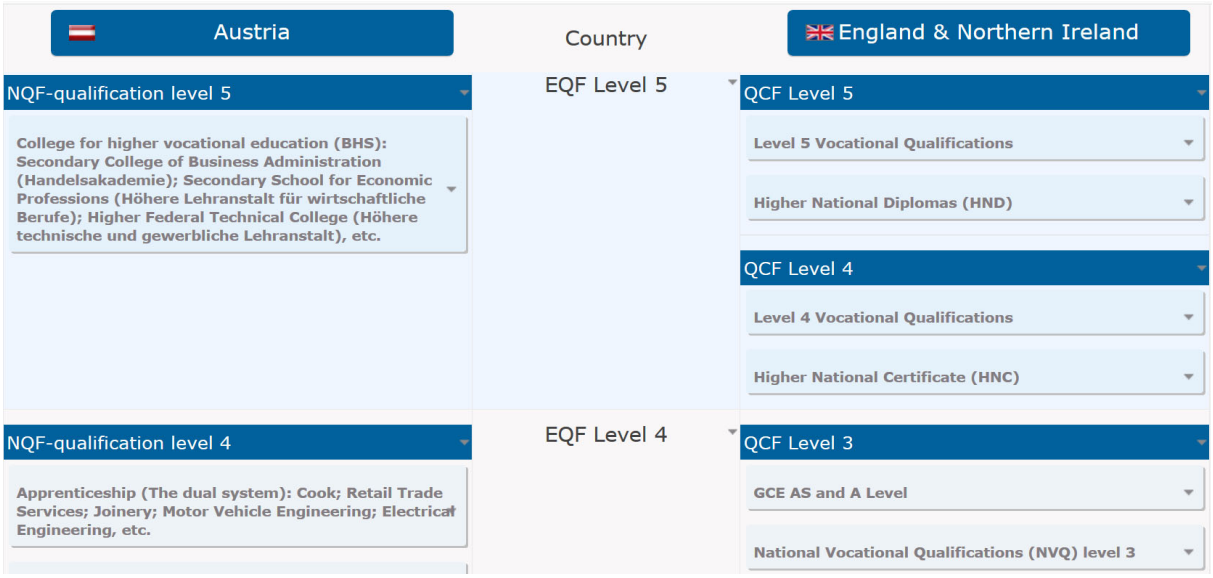
Open sector

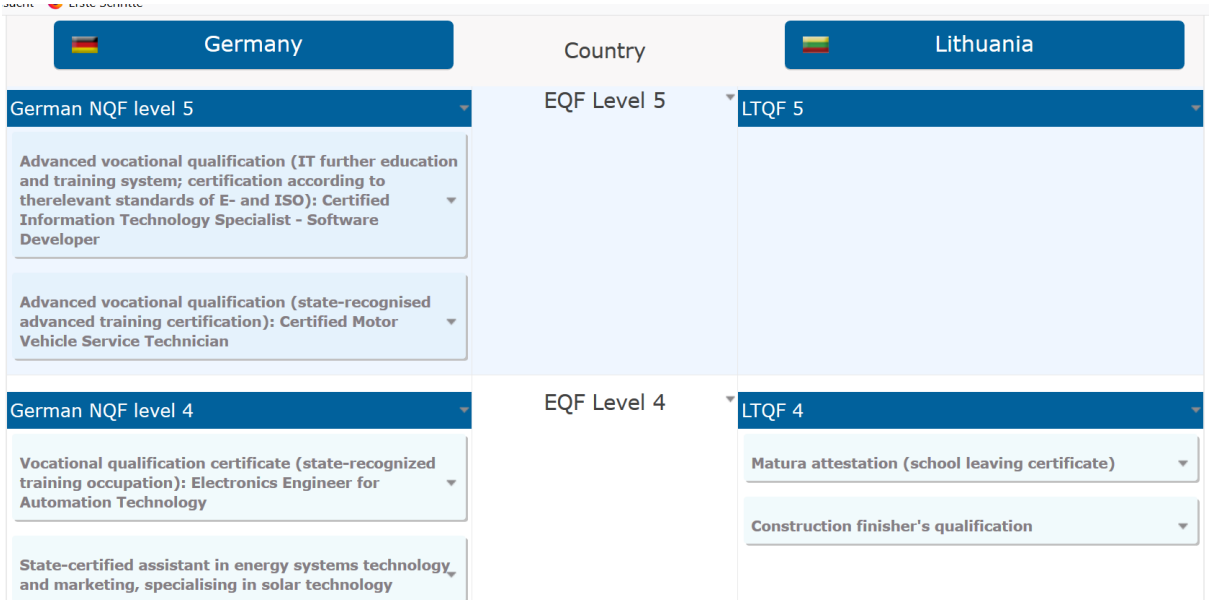
Excourse 1: National Qualification Frameworks in European countries

In all partner countries National Qualifikation Framework NQR exist, but experiences and effects are quite different. UK, for instance, has a long tradition and common attitude regarding acknowledgment and accreditation of non-formal and informal gained competences, while in Austria and Germany the comparison of formal and non formal gained competences is a quite recent topic.

The following tables give a "flashlight" for the position of apprenticeship in the partner countries, more detailed data is available in the

Source: https://ec.europa.eu/ploteus/en/compare





All NQRs refer to the European Qualification Framework, but in different ways. So UK has separat NQRs for England and Northern Ireland and for Wales and Scotland. In UK England and Northern Island two NQRs exist, one for academic and vocational qualifications and one for higher education. Austria is in a very early operational status, and Lituania has a quite open approach defining non-formal and informal gained competences.

See also source:
https://www.qualifikationsregister.at/res/file/Cedefop_NQF_developments_europe_2018.pdf

Excourse 2: Digitalisation in European countries

A recent overview about status and performance of Digital Agenda in European countries gives „The Digital Economy and Society Index (DESI)" from MaY 2018, esp. the chapter „Humnan Capital/Digital Skills"

See source: https://ec.europa.eu/digital-single-market/en/desi"Human

The Digital Economy and Society Index is a composite index that summarises some 30 relevant indicators on Europe's digital performance and tracks the evolution of EU Member States, across five main dimensions: Connectivity, Human Capital, Use of Internet, Integration of Digital Technology, Digital Public Services. The findings are used to create data visualisations pertaining to European performance in Digital Economy and Society.

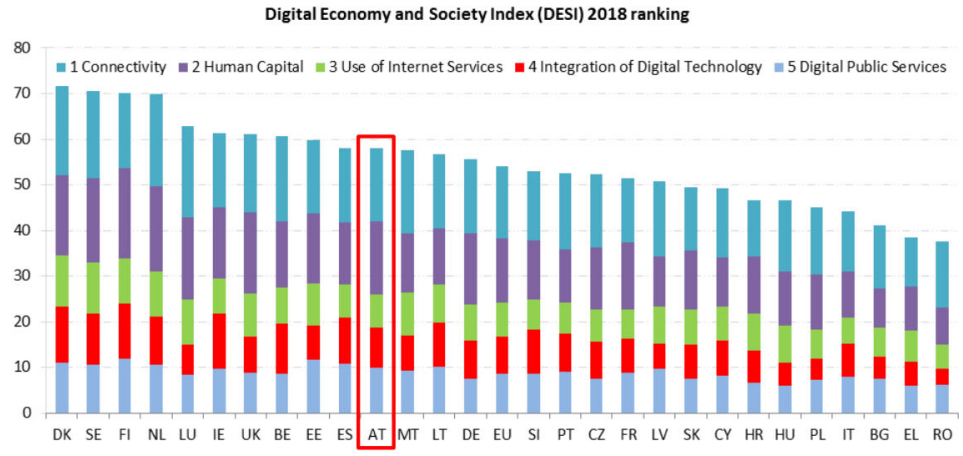
Austria:

Digital Economy and Society Index (DESI)1 2018 Country Report Austria

Source: https://ec.europa.eu/digital-single-market/en/desi

The DESI report tracks the progress made by Member States in terms of their digitisation. It is structured around five chapters:

1 Connectivity	Fixed broadband, mobile broadband and prices
2 Human Capital	Internet use, basic and advanced digital skills
3 Use of Internet Services	Citizens' use of content, communication and online transactions
4 Integration of Digital Technology	Business digitisation and e-commerce
5 Digital Public Services	eGovernment and eHealth



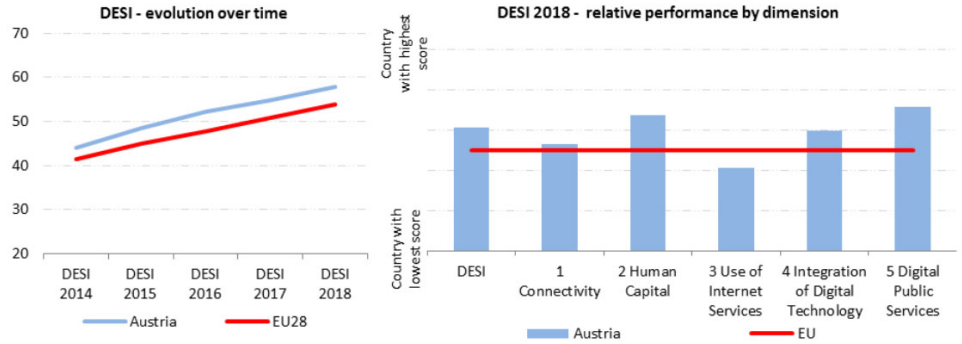
2 Human Capital

2 Human Capital	Austria rank	Austria score	Cluster score	EU score
DESI 2018	7	64.4	58.6	56.5
DESI 2017	7	62.4	56.5	54.6

	Austria DESI 2018 value		Austria DESI 2018 rank	Austria DESI 2017 value	Austria DESI 2017 rank	EU DESI 2018 value
2a1 Internet Users % individuals	85% 2017	↑	10	82% 2016	11	81% 2017
2a2 At Least Basic Digital Skills % individuals	67% 2017	↑	8	65% 2016	8	57% 2017
2b1 ICT Specialists % total employment	4.2% 2016	↑	6	4.0% 2015	8	3.7% 2016
2b2 STEM Graduates[3] Per 1000 individuals (aged 20-29)	22.1 2016	↓	5	23.0 2014	2	19.1 2015

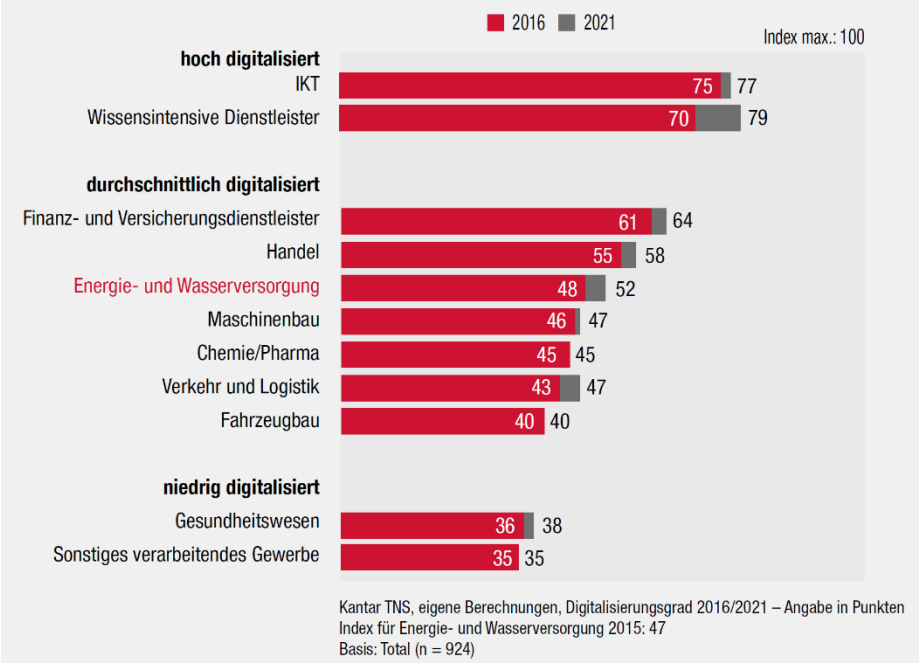
Austria belongs to the Medium performing cluster of countries[2].

At the end of December 2017, the new government presented its programme until 2022. The programme identifies digitisation as one of the key priorities, and indeed refers to it as a vector of transformation in every policy field. Nevertheless, the focus is to cybersecurity on digital public services, connectivity and suitable framework conditions.



Germany:

In the following you find a study which describes the digitalisation index in Germany.

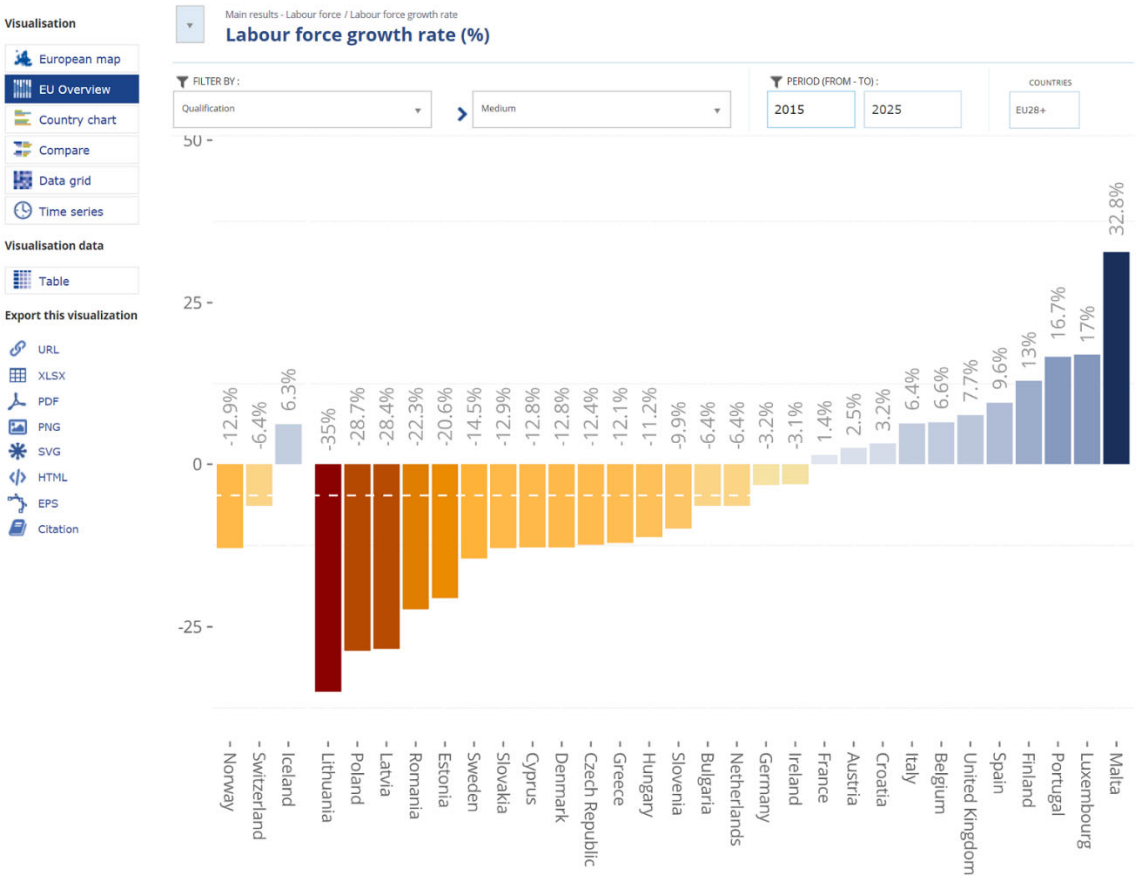


Source: DVGW ewp kompakt 04/2017

Comparison of the change of qualifications in Europe interactive charts available

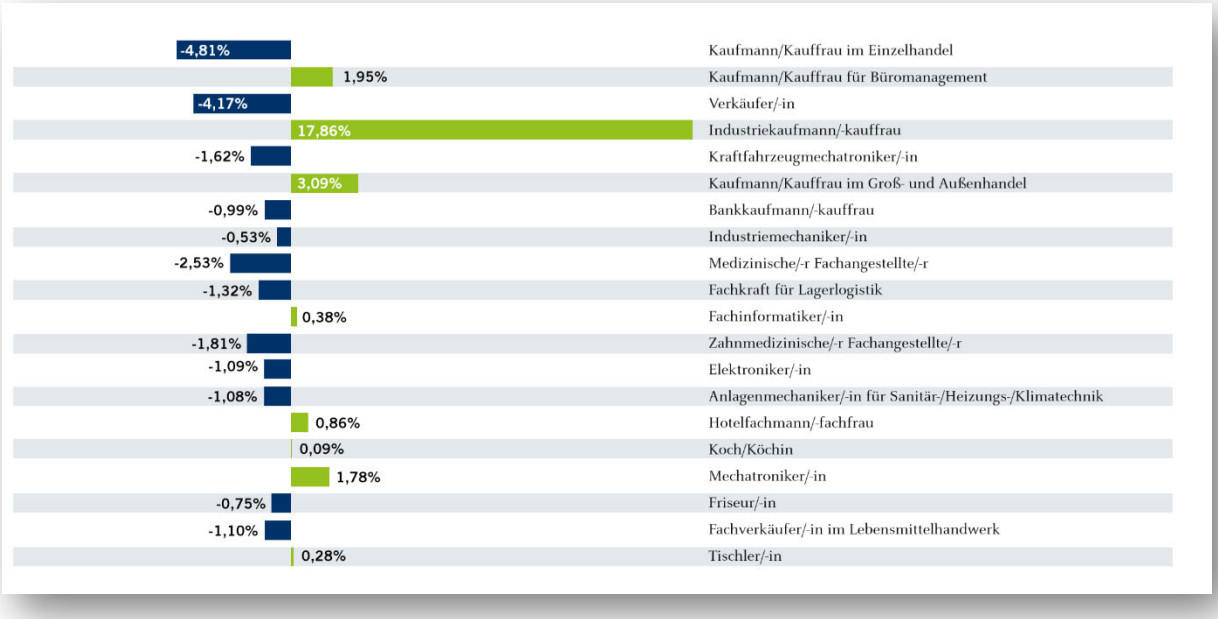
http://www.cedefop.europa.eu/de/publications-and-resources/data-visualisations/labour-force

sample


Visualisation
European map
EU Overview
Country chart
Compare
Data grid
Time series
Visualisation data
Table
Export this visualization
URL
XLSX
PDF
PNG
SVG
HTML
EPS
Citation
Main results - Labour force / Labour force growth rate
Labour force growth rate (%)
FILTER BY :
Qualification
Medium
PERIOD (FROM - TO) :
2015
2025
COUNTRIES
EU28+
50
25
0
-25
-12.9%
-6.4%
6.3%
-35%
-28.7%
-28.4%
-22.3%
-20.6%
-14.5%
-12.9%
-12.8%
-12.8%
-12.4%
-12.1%
-11.2%
-9.9%
-6.4%
-6.4%
-3.2%
-3.1%
1.4%
2.5%
3.2%
6.4%
6.6%
7.7%
9.6%
13%
16.7%
17%
32.8%
Norway
Switzerland
Iceland
Lithuania
Poland
Latvia
Romania
Estonia
Sweden
Slovakia
Cyprus
Denmark
Czech Republic
Greece
Hungary
Slovenia
Bulgaria
Netherlands
Germany
Ireland
France
Austria
Croatia
Italy
Belgium
United Kingdom
Spain
Finland
Portugal
Luxembourg
Malta

Reference: https://www.na-bibb.de/fileadmin/user_upload/na-bibb.de/Dokumente/06_Metanavigation/02_Service/Publikationen_Warenkorb/NA-Journal27_Web.pdf

Mobility participation of the 20 strongest professions according to graduates



Dargestellt wird die Differenz zwischen dem Anteil des Ausbildungsberufes an allen dualen Stipendiaten in Erasmus+ und dem Anteil des Berufes an allen Absolventen in Deutschland. Berufe mit einem positiven Wert sind folglich überdurchschnittlich, Berufe mit einem negativen Wert unterdurchschnittlich mobil.

It shows the difference between the share of the training occupation in all dual scholarship holders in Erasmus+ and the share of the occupation in all graduates in Germany. Occupations with a positive value are therefore above average, occupations with a negative value below average mobile.

KEY DOCUMENT FROM EU

Skills Development and Employment: Apprenticeships, Internships and Volunteering

http://www.europarl.europa.eu/RegData/etudes/STUD/2017/602056/IPOL_STU(2017)602056_EN.pdf

Includes hundreds of references to apprenticeship themes in the EU.

Lithuania:

No additional comment/information

United Kingdom:

No additional comment/information

7. Concept for Basis for Framework

7.1. General Remarks

Although a binding common definition of "project based learning" in involved countries, partner organizations, or in European Union, Cedefop etc. does not exist, it seems there is a quite similar understanding what it should be, which elements it contains and what effects and quality outcomes can supported with this learning methodology.

Some short excerpts out of the contributions by the partner countries and organizations can show that, see the detailed information in Chapter 5. in this comparison study, additional the huge source of information, provided by the German partner in Appendix 8

https://wiki.soluvia.de/confluence/display/EAT/IO1+-+German+Apprenticeship+Comparison+Study?preview=/138714476/141789480/The%20change%20of%20educational%20processes%20of%20vocational%20education%20in%20the%20course%20of%20demographic%20change.docx

Some short excerpts from the partner reports to this topic see here, e.g.:

Austria

Detailed information	The project allows the apprentices to think about different topics (for example Time and Self-Management, learning techniques, Industry 4.0, or any other topic the apprentices want to work on) and think about how to in the best possible way present their project to another AVL employee.
Skills	Time Management, Communication, Teamwork, Emotional Intelligence, Project Management, Self-Organization

(see Ch.5.1.)

Germany

"A learning process becomes an educational process in that the learner on the content-related stage, together with others, consciously learns to reflect on and construct his / her learning experience under the guidance of a facilitator from the content level to the design of their own inner learning process.

Talent management in education. Ideally, in a cross-career design, in which, in addition to a self-nomination self-nominated project-oriented tasks allow a high degree of creative freedom.

The embedding of these learning processes in an expanded organizational framework, which allows the individual educational processes to be developed across occupational areas, in

and with the company in which one is working together to jointly control the demographic future and maintain its innovative strength."

(see Appendix 8 MVV)

Lithuania

"Project based learning is a method using which the students together with the help of a teacher learn how to analyze and solve complex of problems. It is a teaching and training activity the result of which is the understanding of the problem and giving the proposal for its solution. Strategic thinking, teamwork and analytical skills are developed using project based learning. This method helps to develop the skills necessary for practical work, links the theoretical elements with practical activities.

The project based learning is widely used in engineering, technological, information technologies studies. learning."

(see Ch. 5.3.)

United Kingdom

Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to authentic, engaging and complex questions, problems, or challenges.

A PBL model requires high level, constant planning and mapping to the core curriculum but this brings significant benefits through increased student engagement, motivation and achievement of learning outcomes.

(see Ch. 5.4.)

For preparation of concrete common concepts of project based learning courses these approaches of understanding should be discussed, reflected and evaluated, but, there is the expectation that no essential differences concerning this common understanding will exist.

Against that background, a concept as basis for a framework for a common programme for "Project based learning", involving apprentices from different countries and various companies should reflect the dimensions

- Targets
- Contents
- Methods

- Formats
- Ressources

Reflecting the fact that systems and processes of apprentice VET in the involved, and other, European countries differ conclusions and recommendations concerning these dimensions must have a mor general character, as a kind of "Meta-Concept", that should be interpreted and created along the interests, opportunities and circumstances of the respective involved partners.

7.2. Elements of a Framework for a common "European Project Based Apprentice Training"

Remarks, Recommendations, Reflections

Targets

Learning outcomes for students and apprentices

Respecting the different occupational concepts, apprenticship systems and training plans in the partner countries, the concrete targets for joint training activities must be coordinated in detail between the partners.

The possibility of using project-based training methods to develop and strengthen skills such as independent work, self-directed learning, entrepreneurial attitudes, independence, responsibility, time management, reliability, etc., should be a central goal of all project-based training approaches

To learn and train together with colleagues from other countries, from other companies, with different cultural backgrounds is a common goal whis is relevant for individuals, for companies as well as for society and for Europe

Benefit for companies

Experiences and expertise that apprentices cannot gain in the same way in the own company alone

Learning from others, but, also recognize own competences and quality in relation to others

Self esteem, motivation, intercultural feeling for apprentices in early stage of professional life – an added value for cooperation and further personal development of empoyees in companies

Added value for labour market, society, European community

Increasing employability of young people

Intercultural understanding

European minded young people

Language competencies

Etc.

Contents

STEM Subjects

In any case, it will make sense to agree on essential contents such as Industry 4.0, digitization, as well as core areas of the technological expertise of the companies

Personal and Social Skills

Beside the technical contents in all involved partner countries and organizations personal and social skills are topics with high importance.

Working approaches for a changing world in 21st century

Methods

To agree between involved partners and companies on the base of experiences ans intended innovated approaches

Also according the qualification and training of trainers and coaches

Self directed, entrepreneurial, self reliable approaches

Presence and distance learning

Interactive collaboration

Shift from directive advice to coaching processes

Etc.

Format

Duration, Frequence: Depending on legal and organizational conditions from one week to integrated three-year-programmes

Localization: in one country, company, venue… or flexible variations

Trainers: (internal / external)

Language: Local, English…

Ressources

To be discussed and clarified together

8. Annexes

8.1. Germany Annexes / Bibliography

You will find Germany Annexes and Bibliography including all references here:

https://wiki.soluvia.de/confluence/display/EAT/IO1+-+German+Apprenticeship+Comparison+Study

8.2. References

Austria

http://mint-steiermark.at/blog/warum-open-mint

http://girlsday.berufsorientierung.at/

http://www.jugendreferat.steiermark.at/cms/beitrag/12641349/598018/_1

https://www.avl.com/lehre-mit-matura

The Austrian Education System

VET Schools and Colleges in Austria

Higher Education in Austria

Education and Training Monitor 2017 – Austria

Federal Ministry of Education, Science and Research

Apprenticeship (PDF, 1MB)

Lehrberufsbezeichnungen (deutsch-englisch) (PDF, 353kB)

Lehrberufsbeschreibungen (PDF, 1MB)

https://www.en.bmdw.gv.at/Vocationaltraining/Apprenticeshipsandvocationaltraining/Seiten/default.aspx

New opportunities – Austrian Digital Strategy

https://oead.at/en/outgoing/vocational-education-and-training/

Erasmus+ mobility projects in vocational education and training

https://oead.at/en/projects/mobility-projects-in-erasmus/

https://ifa.or.at/en/about/

Germany

Federal Ministry for Family Affairs, Senior Citizens, Women and Youth

Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany

Federal Ministry of Education and Research

National Student Fee and Support Systems

Organisation of the Academic Year in Higher Education

Organisation of School Time in Europe

Recommended Annual Instruction Time in Full-Time Compulsory Education in Europe

Teachers and School Heads Salaries and Allowances in Europe

www.destatis.de

http://ec.europa.eu/eurostat/data/database

http://www.bibb.de/veroeffentlichungen/de/publication/download/id/7722

http://www.cedefop.europa.eu/en/publications-and-resources/publications/8057

http://www.refernet.de/images_layout/bibb_refernet_2017_onlineversion_1_barrierefrei.pdf

http://www.dqr.de/media/content/Der_Deutsche_Qualifikationsrahmen_fue_lebenslanges_Lernen.pdf [15.10.2015]

http://www.dqr.de/media/content/German_EQF_Referencing_Report.pdf

https://www.apprenticeship-toolbox.eu/germany

https://statistik.arbeitsagentur.de/Statischer-Content/Arbeitsmarktberichte/Berufe/generische-Publikationen/Broschuere-MINT.pdf

https://www.destatis.de/DE/Publikationen/StatistischesJahrbuch/Arbeitsmarkt.pdf?__blob=publicationFile

https://www.wbv.de/openaccess/themenbereiche/bildungs-und-sozialforschung/shop/detail/name/_/0/1/300936w/facet/300936w///////nb/0/category/1142.html

https://www.gesamtmetall.de/sites/default/files/downloads/mint-herbstreport_2017_final.pdf

https://www.iwkoeln.de/studien/gutachten/beitrag/christina-anger-sarah-berger-oliver-koppel-axel-pluennecke-mint-herbstreport-2017-368955.html

https://www.bibb.de/dokumente/pdf/fbi-22_barrierefrei.pdf

https://www.eca.europa.eu/Lists/ECADocuments/SR17_5/SR_YOUTH_GUARANTEE_DE.pdf

http://planet-beruf.de/eltern/mein-kind-unterstuetzen/stellensuche-bewerbung/weitere-beitraege-stellensuche-bewerbung/glossar-berufsvorbereitende-angebote/

https://www.worldskillsgermany.com/

https://www.dihk.de/themenfelder/aus-und-weiterbildung/bildung-international/auslandsaufenthalte-waehrend-der-ausbildung/wie-azubis-ins-ausland-kommen

More German references in WIKI

https://wiki.soluvia.de/confluence/display/EAT/IO1+-+German+Apprenticeship+Comparison+Study

Lithuania

Organisation and Governance

Early Childhood Education,

Primary Education,

Secondary and Post-Secondary Non Tertiary Education

Higher Education

Adult Education and Training.

http://www.cedefop.europa.eu/de/publications-and-resources/publications/4140

www.cedefop.europa.eu/files/4140_en.pdf

http://klaster.lt/en/apzvalga/

http://www.balticcouncil.org/en/sakums/

http://www.emokymas.eu/english/

https://www.dofe.lt/lt/about-us/

United Kingdom

https://www.gov.uk/education/apprenticeships-traineeships-and-internships

https://www.gov.uk/government/publications/apprenticeship-funding-and-performance-management-rules-2017-to-2018

https://www.gov.uk/government/publications/key-facts-about-apprenticeships/key-facts-about-apprenticeships

https://www.gov.uk/search?q=apprenticeships&show_organisations_filter=true

https://www.gov.uk/government/publications/apprenticeship-levy-how-it-will-work/apprenticeship-levy-how-it-will-work

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/562401/Apprenticeship_funding_from_May_2017.pdf

https://www.gov.uk/guidance/employing-an-apprentice-technical-guide-for-employers

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/598603/Schools__guide_to_apprenticeship_reforms.pdf

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/482754/BIS-15-604-english-apprenticeships-our-2020-vision.pdf

https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/graduatesintheuklabourmarket/2017

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/659710/Apprenticeships_evaluation_2017_employers.pdf

https://www.ucas.com/file/130956/download?token=l2IYNkcz

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/444048/High_level_STEM_skills_requirements_in_the_UK_labour_market_FINAL.pdf

https://www.nao.org.uk/wp-content/uploads/2018/01/Delivering-STEM-Science-technology-engineering-and-mathematics-skills-for-the-economy.pdf