

Country report

Austria

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Vienna, July, 2014

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1. Introduction

Those countries that have a comprehensive training system including a dual education (Austria, Germany, Switzerland, the Netherlands, Luxembourg and - with limitations Denmark) show - in comparison to other member countries - significantly lower youth unemployment rates. In the case of Austria this is attributed to a differentiated system of vocational education and training and the institutionally well-established dual vocational training system. Austria - as well as the other aforementioned countries - can serve as a model or other countries in tackling youth unemployment, although the Austrian system cannot be transferred easily to other countries. In addition, also for the Austrian vocational training system in general and the training of apprentices in particular there is urgent need for optimization in some areas. This is especially true for the turn to the learning outcomes.

The following report provides a short overview to the Austrian system of vocational education and training, describes in two examples (automotive and metal technology) the state of training regulations and the assessment processes and documents the current state of the learning outcome orientation in vocational education and training in Austria.

2. Austrian education system in general

Austria has a free and public school system, nine years of education are mandatory. The legal basis for primary and secondary education in Austria is the School Act of 1962. The federal Ministry of Education and Women is responsible for funding and supervising primary and secondary, education. Primary and secondary education is administered on the state level by the authorities of the respective states.

The elementary level (ISCED 0) in Austria refers to the following childcare institutions: crèches, kindergartens, after-school care facilities and children's groups. Playgroups and nannies also offer their services. Since 2010/2011 one year of pre-school education is compulsory. All five year old children have to attend pre-school education to the extent of 16 to 20 hours at least four days a week. Also pre-school education of children of school age who are not yet ready for school belongs to the elementary level.

School attendance is compulsory for all children who are permanent residents of Austria. Compulsory schooling starts on September 1 following a child's sixth birthday and lasts nine school years. The first four years all pupils are educated in one type of primary school (Volksschule). After primary school there are three types of lower secondary education in Austria: the lower secondary school (Hauptschule), the new secondary school (Neue Mittelschule) which will replace the lower secondary school in 2015/16, and the academic secondary school, lower level (Allgemeinbildende höhere Schule – Unterstufe). The requirement for admission to the first year is successful completion of the fourth year of primary school (with "very good" or "good" marks in German, reading and mathematics),

or a statement from the primary school conference that in spite of a “satisfactory” grade in these required subjects, the student’s overall achievement will probably meet the requirements of academic secondary school, or an entrance examination.

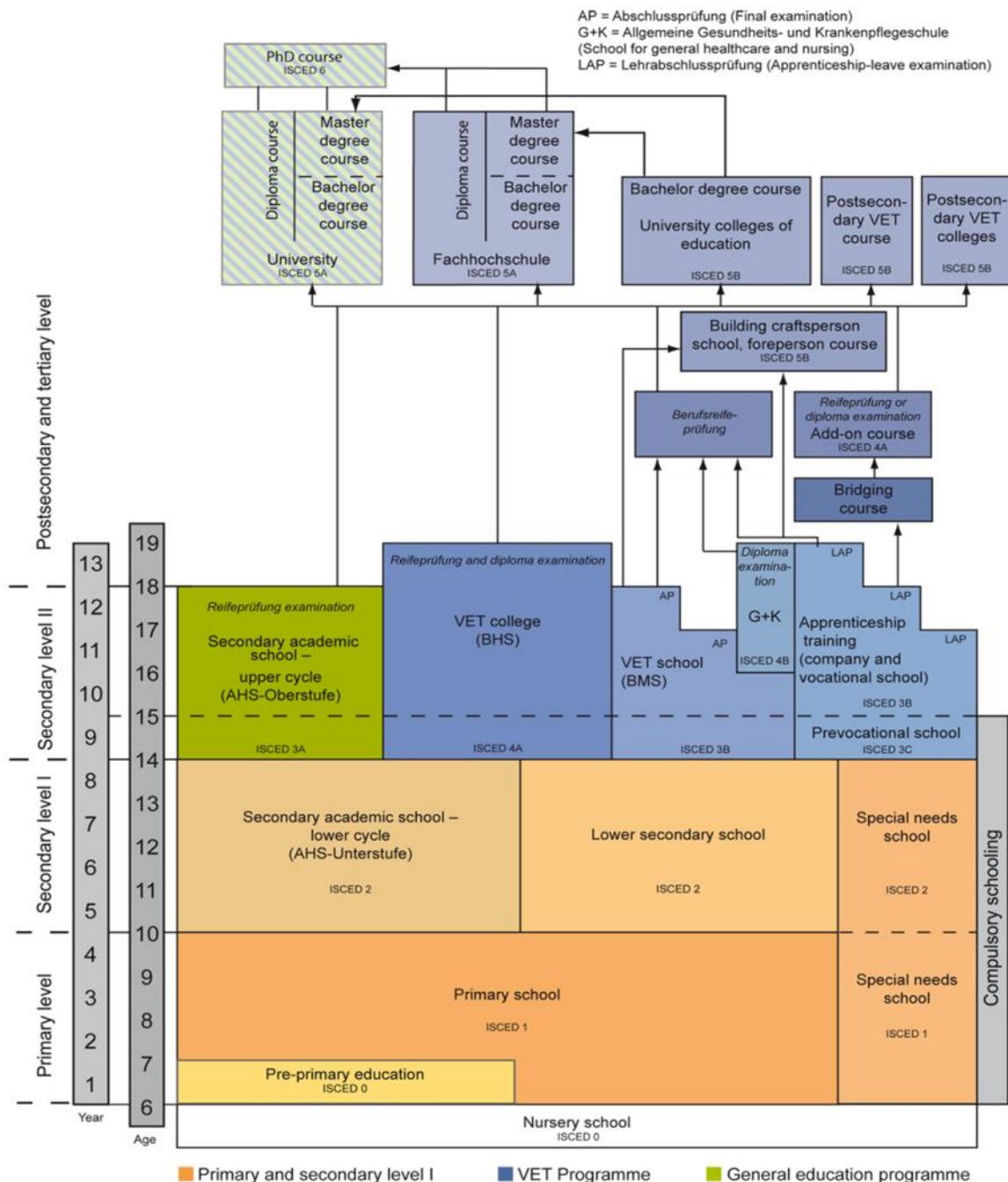


Figure 1: The Austrian Educational system

Source: Federal Ministry of Education and Women,

https://www.bmbwf.gv.at/en/fr/school/bw_en/bw2013_e_grafik_17684.pdf?4du97u Download: May

30th, 2014

A central feature of the Austrian education system is the need to decide at an early age of 14/15 years, if the aim is to attend vocational education or training or general education. Since the compulsory education in Austria of nine years, young people have to go to school for another year after completion of lower secondary school, new secondary school or lower level of academic secondary school. The type of school they choose depends on whether they want to attend vocational education (either as an apprentice or in schools) or academic education leading to a level A degree.

The academic secondary school comprises a four-year upper level terminating with the Certificate of Secondary Education. The school leaving certificate entitles the student to embark on a course of study at a university, university college, teacher training college or academy. Within certain limits, each school can adjust the courses it offers in both the lower level and the upper level to suit its specific situation (autonomous curricula). It may also be entitled to issue autonomous curricula.

Special types of academic secondary schools are:

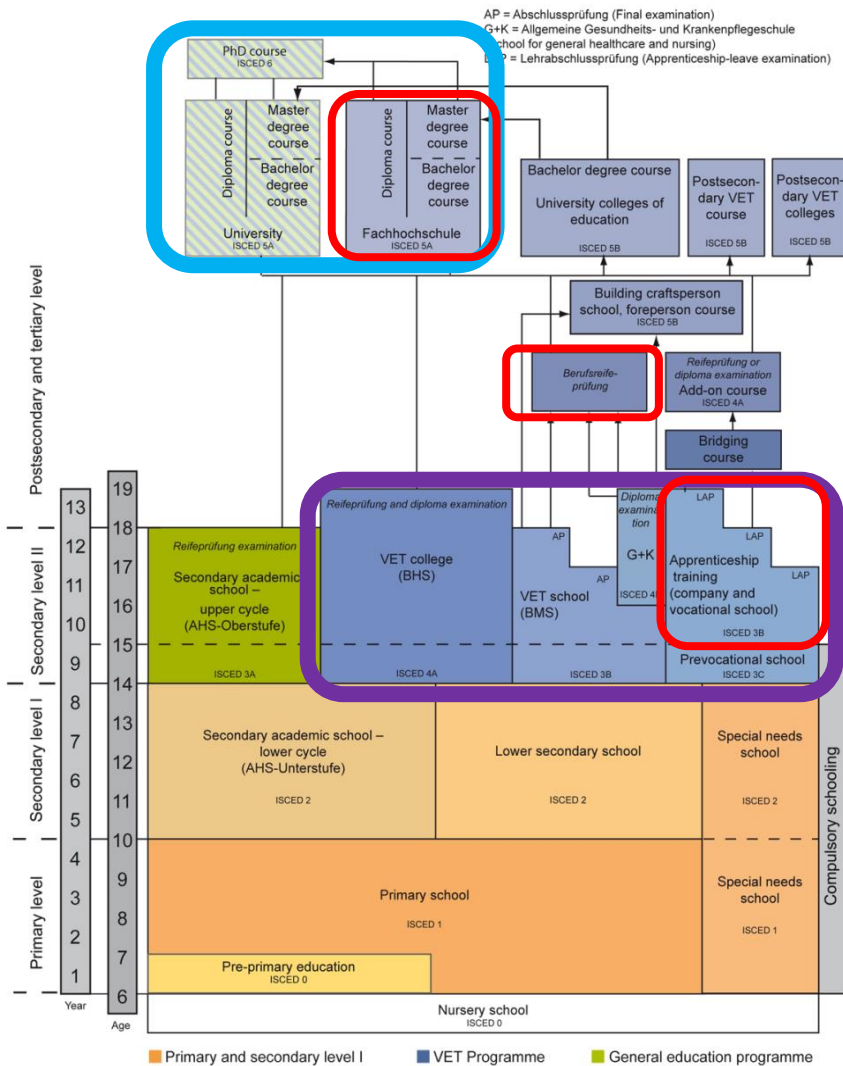
- Secondary academic schools with artistic and sporting priorities and proficiency test
- Supplementary secondary school and supplementary scientific secondary school
- Secondary school, scientific secondary school and economics secondary school for working people
- Secondary academic schools for language minorities (Slovenian, Croatian, Hungarian)
- Trade and craft school
- Secondary schools and scientific secondary schools with extensive foreign language tuition.

3. Vocational education and training in Austria

Austria has a differentiated system of initial vocational education and training from upper secondary level up to tertiary education. Young people can choose whether become apprentices in the so-called dual system or to attend a school of middle or higher vocational education.

For those who want to become apprentices the one-year polytechnical school was implemented in order to cover the ninth year of compulsory education. Thanks to the fact that tuition totals 32 periods per week, students acquire the basic vocational knowledge and skills to give them the best possible qualifications for entering into apprenticeships or transferring to more advanced schools. Autonomous school curricula make it possible to adjust the total number of periods per week both in elective subjects and in required subjects to suit students' interests.

Polytechnic schools are run either as independent schools or in organizational units together with academic secondary schools. Students who pass the final examination at a polytechnic school are entitled to transfer to the second grade of a medium-level secondary technical and vocational school of the same type with at least 15 hours/week in their selected area of specialization, or to the first grade of an upper-level secondary technical and vocational school without taking an entrance examination.



HE

- Universities of applied Sciences

IVET System

- Dual VET System
- Voc. Schools and Colleges
- BRP: General higher education entrance (VET)

Not in "the System"

- "Master"-Qualification
- Adult Education incl. Labour Market-training

Figure 2: The Austrian System of Vocational Education and Training

There is a high significance of iVET at upper secondary level: about 80% of all people at the age of 15 to 19 years attend one form of initial vocational education and training:

- Apprenticeship training (dual system): 38%
- Medium-level secondary technical and vocational schools: 12%
- Upper-level secondary technical and vocational schools: 24%.

3.1 Medium-level secondary technical and vocational schools (Berufsbildende mittlere Schulen)

Students attend medium-level secondary technical and vocational schools for one to four years. Students at such schools with a one- or two-year curriculum receive partial vocational training, whilst those at schools with a three- or four-year curriculum and final examination receive full vocational training. The relevant qualifications of graduates are laid down by the Trades Act. After completing at least a three-year curriculum at a medium-level secondary technical and vocational college, students can take supplementary courses (three years) to pass the matriculation and diploma examinations. There are also special types of specialized adult education courses for graduates of four-year technical schools.

The most important medium level secondary technical and vocational schools are:

- Industrial, trade and crafts colleges (three or four-year courses)
- Commercial college (three-year courses)
- Technical college for commercial occupations (three-year courses)
- Federal Sports Academy (three-year courses)
- Business school (one or two-year courses)
- Fashion school (three-year courses)
- Schools for hotel management, tourism, catering (three-year courses)
- Schools for social workers (three-year courses)
- School for social services (two-year courses)
- Schools for social care workers (two to four-year courses, admission between 17 and 19 years of age)
- Agricultural and forestry schools (two to four-year courses)
- Schools for hygiene and nursing (admission between 16 and 17 years of age)

3.2 Upper-level secondary technical and vocational schools (Berufsbildende höhere Schulen)

Besides a sound general education, in five years of courses upper-level secondary technical and vocational schools provide higher vocational training, terminating in matriculation and diploma examinations. The matriculation examination qualifies the student to enter a university, university college or teacher training college, the diploma examination allows the student to enter a profession regulated in accordance with the Trades Act.

Universities and university colleges are required by law to give students credit for the specialized knowledge acquired by graduates of upper-level secondary technical and vocational schools. The qualifications obtained by graduates of higher technical and agricultural schools are regulated by the Engineers Act.

At the European level, Directive 2005/36/EC provides for admission to a regulated occupation in another EU member state requiring successful completion of a college or university curriculum of (up to) four years for entry into that occupation.

The most important upper level secondary technical and vocational schools are:

- Upper-level secondary industrial and trade school
- Upper-level secondary college for fashion
- Higher-level secondary college for art and design
- Upper-level secondary college for tourism
- Commercial college
- Upper-level secondary college for commercial occupations
- Upper-level secondary college for agriculture and forestry
- Kindergarten teacher-training college
- Teacher-training college for social education

3.3 The apprenticeship system (dual system, “Lehrlingsausbildung”)

The Austrian apprenticeship system is characterized by two places of learning: the work-based learning at the enterprise constitutes about 80% of the learning period and focusses on job-specific knowledge and skills, and the school-based learning in a part-time vocational school which binds about 20% of the learning time and focusses on basic subject-related theory and general education.

The compulsory technical and vocational school (vocational schools) teaches apprentices basic theory in comprehensive extra-occupational courses while they train in their trades. It promotes and supplements in-company training and general education. The number of school years at a vocational school is commensurate with the length of training required in a given apprenticeship. The training may last from two to four years depending on the apprenticeship, though the norm is three years.

Tuition at a vocational school may be organized in any of the following ways: throughout the year, i.e. at least one full school day or at least two half school days per week; this may either be based on the apprenticeship, i.e. at least eight weeks at once, or on time of year, i.e. an instruction block for a specific period of the year. The wide variety of organizational forms is the result of an agreement between industry and the school authorities and takes into account the requirements of individual sectors and regions. Close cooperation between all those involved in vocational training at different centres of learning is one of the key factors behind the success of the dual system. Modern vocational training requires close links between theory, (vocational school tuition) and industrial practice.

There are currently more than 200 recognized trades in the following categories: Construction – office, administration, organization – chemistry – printing, photography,

graphics, paper processing – electrical engineering, electronics – catering – health and hygiene – commerce – wood, glass, plastics, ceramics – information and communications technologies – food, beverages and tobacco – metallurgy and mechanical engineering – musical instrument building – textiles, fashion, leather – animals and plants – transportation and warehousing.

The apprenticeship-leave exam is taken in front of board of professional experts. The focus of this exam is on the competences required for the respective profession (simulation of day to day tasks).

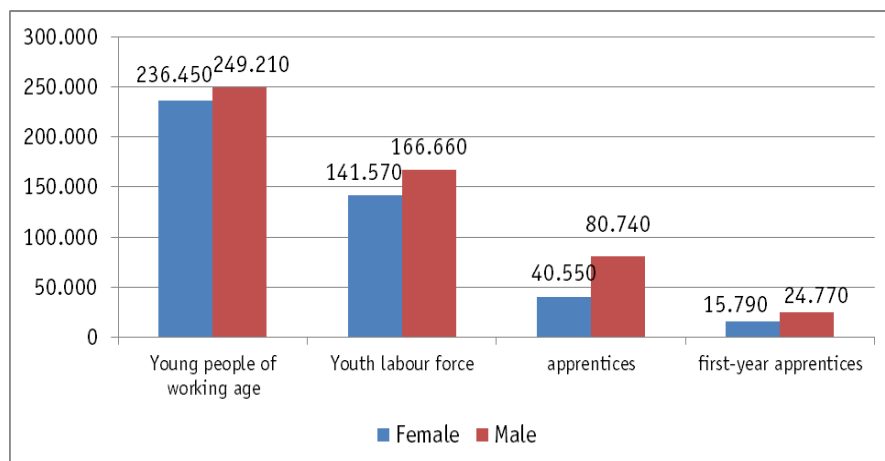
The apprentice enters an apprenticeship contract with his training company and is employed and in a training relationship with his or her training company and a (compulsory) student at a part-time vocational school at the same time. Because the apprentice is employed he/she gets an apprenticeship remuneration which rises up to approx. 80% of the income of skilled workers in last year of apprenticeship (though the amount of the apprenticeship remuneration is due to the profession).

The Legal framework for the apprenticeship system ist the Vocational Education and Training Act (Berufsausbildungsgesetz). Each apprentice profession has its own training regulations which are negotiated by the social partners at the Federal Advisory Board on Apprenticeship and made public by the Federal Minister for Science, Research and economy, and thus obtain the force of law. The apprenticeship contracts are governed and controlled by the apprenticeship offices which are part of the Chamber of Commerce.

	Work-based learning	School-based learning
Federal Level	Federal ministry of Economy Federal Advisory Board on Apprenticeship (Social Partners)	Federal ministry of Education
Provincial Level	Apprenticeship Offices Provincial Advisory Board on Apprenticeship (Social Partners) Federal governors	Regional school inspectors Federal provinces
Local Level	Company, Trainer	Part-time vocational school, Teacher
	Apprentice	

Figure 3: Governance of the apprenticeship systems

Currently 121.290 young people are in apprenticeship contracts with about 35.000 training companies (13,3% of all companies).



Labour Force: People, who have been employed or unemployed at least once during the year

Figure 4: Young People (15-19): People of working age, labour force, apprentices (2012)

Source: Petra Gregoritsch et.al: *Lehrlingsausbildung: Angebot und Nachfrage*. Wien: AMS 2013.

With the girls retail trade, office clerk, hairdresser/stylist and restaurant specialist or the most common apprenticeship professions, whereas boys prefer metal technology, electrical engineer, car mechanics and plumbing.

	Total number	Share		Total number	Share
Girls	43.134	100,0%	Boys	82.094	100,0%
Retail trade	10.964	25,4%	Metal Technology	11.212	13,7%
Office clerk	5.273	12,2%	Electrical engineer	8.852	10,8%
Hairdresser, stylist	4.424	10,3%	Car mechanics	7.837	9,5%
Restaurant Specialist	1.659	3,8%	Plumbing	4.897	6,0%
Cook	1.600	3,7%	Retail trade	4.887	6,0%
Catering specialist	1.204	2,8%	Carpenter	3.639	4,4%
Pharmaceutical-commercial assistant	1.190	2,8%	Cook	3.055	3,7%
Hotel and Hospitality Assistant	1.164	2,7%	Bricklayer	2.967	3,6%
Administrative Assistant	1.049	2,4%	Painting and Coating Technician	1.912	2,3%
Wholesale trade	783	1,8%	Mechatronics	1.662	2,0%

Table 1: Most common apprenticeships, 2012

Source: Petra Gregoritsch et.al: *Lehrlingsausbildung: Angebot und Nachfrage*. Wien: AMS 2013

The strengths of the apprenticeship system are:

- keeping up a tradition (culture) of youth employment (low level of youth unemployment)
- no entry requirements except the age and also a socially recognized way for young people who do not want to attend full time school at upper secondary level
- offering a work integrated learning process with a diploma not only recognized in the training company
- occupational profiles with high acceptance on the labor market
- smooth transition from VET to employment

- For the young people: income (apprenticeship remuneration increasing up to 80% of the salary of a skilled workers at the end of training)
- For companies: Skilled workers tailored for their own needs.

There are also some (important) weaknesses:

- very diverse sector and intransparency because of decentral developments (incl. quality assurance)
- strong gender segregation by occupation
- weak educational competencies of company trainers and examiners
- ongoing discussions on mutual crediting of learning outcomes between apprenticeship-training and full-time vocational schools
- number of training places is strongly dependent on economic prosperity and regional gaps
- (High) failure rates and drop outs
- In good economic times, it is difficult to find or keep good teachers (for vocational schools), as wages in the economy are better than at schools.

4. Two apprenticeships in the automotive and metal sector

Within the TrainCom project the Austria is not part of the information process (via interviews and peer review visits) as other partner countries (Germany, Czech Republic, Spain and Wales). Nevertheless, we provide a short description of the setting and the curricula of vocational training in the Austrian apprenticeship system for two relevant professions, i.e. automotive technology and metal technology.

4.1 Automotive technology (“Kraftfahrzeugtechnik”)

The legal basis for the vocational education and training in automotive technology within the Austrian apprenticeship system is the training regulation “Kraftfahrzeugtechnik-Ausbildungsordnung”, its current version was published in the force of law on November 24th, 2008.¹

This apprentice profession is set up as a module apprentice profession. The Education Code provides a basic module (duration two years), and three main modules (passenger car technology, commercial vehicle engineering and motorcycle technology). If only one main module is selected, the training period is three and a half years, with two main modules are completed, the entire apprenticeship lasts four years. In addition it is the special module system electronics can be selected.

¹ Verordnung des Bundesministers für Wirtschaft und Arbeit über die Berufsausbildung im Lehrberuf Kraftfahrzeugtechnik (Kraftfahrzeugtechnik-Ausbildungsordnung). Bundesgesetzblatt für die Republik Österreich Teil II, Jahrgang 2008, ausgegeben am 24. November 2008 (408. Verordnung)

In the training regulation the professional profile and the skills that should be taught in each module, are described in detail and include the following areas:

- Applying mechanical, electrical and electronic measuring and testing methods, computer-aided diagnostic facilities and evaluating the results
- Check, removal, installation, repair and maintenance of built-in mechanical parts, engines and power transmission equipment
- Check, removal, installation, repair and maintenance of parts of the vehicle, such as chassis, springs, wheel control, suspension, steering, brakes, wheels and tires
- Check, removal, installation, repair and maintenance of electrical and electronic systems of each vehicle type
- Easy testing, removal, installation, repair and maintenance of the safety, comfort and communication electronics
- Check, review, apply, and exchange all coolants and lubricants and other liquids which are necessary for the operation of the particular vehicle type
- carry out work taking into account the relevant safety regulations, the basic automotive and automotive regulations, standards, safety standards and environmental standards.

For the special module the following competences have to be taught:

- Perform tests, development, assembly, repair, maintenance and programming work at the comfort electronics and theft protection systems
- Perform tests, development, assembly, repair, maintenance and programming work on the audiovisual telecommunications and consumer electronics
- Advise customers about the operation, adjustment and programming of anti-theft systems and equipment of comfort and communication electronics.

Within the training order, the learning steps for each of the competencies are described in detail. In addition to the subject specific competences interdisciplinary areas of expertise (e.g. for the company, the apprenticeship system itself, for methodological competence, social and personal skills and work attitude) are formulated.

The training regulation is the basis for both the training in the company and the curriculum for the vocational school and also includes arrangements for the final exam. The exam is divided into a theoretical and a practical test. The theory test comprises the objects automotive technology, mechanical technology, applied mathematics and technical drawing. It may be omitted if the candidate has successfully completed the last class of the vocational school or has demonstrated the successful completion of an medium- or upper level secondary technical and vocational schools which replaces the apprenticeship. The practical examination includes the objects audit work and technical discussion.

The theory test must be made in writing and before the practical test. The test shall include tasks in the following areas:

- In Automotive Technology: Engine technology, power transmission, chassis, motor vehicle electrical and electronic systems and diagnosis (duration max 80 minutes.)
- In Mechanical Technology: Fundamentals of mechanics (statics, dynamics, strength of materials, hydraulics, thermodynamics), operation, materials and auxiliary materials; Tools, machines, devices and equipment; Manufacturing technology; Job preparation, work flow and quality control (duration max. 80 minutes)
- In Applied Mathematics: Mathematical Foundations (length, area, by volume and angle calculations); Calculations for mechanics (such as labor, effort, heat, power); motor engineering calculations (such as engine characteristics, efficiency, fuel consumption, torque); Calculations for vehicle electrics and automotive electronics (such as electrical and electronic circuits) (duration max. 80 minutes)
- In technical drawing: Workshop drawing; electrical circuit sketch, sketches of individual modules (duration max. 80 minutes).

The audit work is based on the execution of a company work order. This includes knowledge and skills that are taught during the training modules according to the agreed contract of apprenticeship. Part of the work order are work planning, measures to ensure safety and health at work, as well as any necessary measures for environmental protection and quality control. The individual steps in the execution of the work order shall be documented. The work order must be formulated so that it can be performed in six hours.

The technical discussion is taken before the entire board of examiners. In technical discussion the examining Commission has to query on issues from corporate practice in accordance with knowledge and skills acquired in the agreed contract of apprenticeship modules. To support the discussion material samples, tools and other demonstration objects can be used. Topics to relevant safety precautions and accident prevention measures are to be included. The technical discussion should last between 15 and 25 minutes.

4.2 Metal technology (“Metalltechnik”)

The legal basis for the vocational education and training in metal technology within the Austrian apprenticeship system is the training regulation “Metalltechnik-Ausbildungsordnung”, its current version was published in the force of law on April 29th, 2011.²

This apprentice profession is set up as a module apprentice profession. The Education Code provides a basic module, eight main modules (Mechanical engineering, automotive engineering, metal and sheet metal engineering, steel structure engineering, forging, tool technology, welding, chipping) and four special modules (Automation technology, design engineering, design engineering, process and manufacturing technology). Apprentices have to choose at least one main module, for specialization another main module or one of the special modules can be chosen. In any case the duration of the apprenticeship is four years

² Verordnung des Bundesministers für Wirtschaft, Familie und Jugend über die Berufsausbildung im Lehrberuf Metalltechnik (Metalltechnik-Ausbildungsordnung). Bundesgesetzblatt für die Republik Österreich Teil II, Jahrgang 2011, ausgegeben am 28. April 2011 (148. Verordnung)

In the training regulation the professional profile and the skills that should be taught in each module, are described in detail and include the following areas:

Basic module plus mechanical engineering:

- Production of relevant work pieces and components, taking into account the prescribed standards and shaft connections for torque transmission
- Making of sketches, single part and assembly drawings with the help of CAD
- Programming and operation of computerized (CNC) machine tools
- Manufacture, assembly, fastening and mounting components, machinery, equipment, facilities and structures according to instructions and plans in conjunction with mechanical, pneumatic and hydraulic systems
- Disassemble, repair and maintenance of components, machinery, equipment, facilities and structures in conjunction with mechanical, pneumatic and hydraulic systems
- systematic prospecting, containing and eliminating errors, defects and malfunctions of components, machinery, equipment, facilities and structures according to instructions and plans in conjunction with mechanical, pneumatic and hydraulic systems
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module plus automotive engineering:

- Customizing of portions of different materials for the manufacture of vehicles
- Assembling, installing and setting up the construction of vehicles (such as truck bodies, truck trailers)
- Mounting, adjusting, troubleshooting (manually and by computer), and eliminating of brake systems
- Assembly, adjustment and inspection of electrical (e.g. lighting system), hydraulic, pneumatic and electronic devices on the vehicle
- systematic prospecting, containing and eliminating errors, defects and malfunctions in the vehicle chassis, vehicle bodies and trailers, and validating vehicle chassis, vehicle bodies and trailers
- systematic prospecting, containing and eliminating errors, defects and malfunctions in electrical (e.g. lighting system), hydraulic, pneumatic and electronic devices on the vehicle
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + metal and sheet metal engineering:

- Making of parts in sheet metal or metal construction technology such as sheet metal profiles, windows, doors, hardware, locks or facade elements
- Assembly and mounting of Konstruktionen such as sheet metal casing, window and facade elements, hardware, locks, etc.
- Repairing and maintaining of Konstruktionen such as sheet metal casing, window and facade elements, hardware, locks, etc.
- Manufacture and installation of sound insulation, moisture, heat insulation and fire protection elements
- Installation and assembly of electrical, pneumatic and hydraulic actuators
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + steel structure engineering:

- Fabricating and machining of steel components for buildings and hangars, portals, containers, etc.
- Assembling, installing and setting up of structures such as buildings and hangars, portals, containers, etc.
- Repair and maintenance of structures such as buildings and hangars, portals, containers, etc.
- Check, prepare, treat and protect surfaces including corrosion protection
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + forging:

- Design and representation of metal artworks on paper and in the model
- Forging by hand and with power hammer according to drawing, sample and mask and dies for the manufacture of forged products (such as railings, grilles, gates, doors, fences)
- Assembling, Assembly, adjustment and repair of wrought products (such as railings, grilles, gates, doors, fences)
- Making the forging tools and devices
- Heat treatment of metal materials for thermoforming or material improvement
- Restoration and preservation of historic metalwork
- Collection and documentation of technical data on the progress of work and for the results

- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + tool technology:

- Production and processing of simple and complex parts on conventional and (CNC) machine tools, taking into account the standards
- Assembling, adjustment, commissioning and testing of tools and modules of the stamping, molding and injection molding technology
- Repair and maintenance of tools and modules of the stamping, molding and injection molding technology
- systematic prospecting, containing and eliminating errors, defects and malfunctions of tools and modules of the stamping, molding and injection molding technology
- Application of heat treatment and hardness testing
- Perform test series for first article inspection
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + welding:

- Editing relevant materials by hand and by machine
- preparation of welds by hand and by machine
- Performing various welding processes of metals
- After-treatment of welded joints as well as identify and fix welding defects
- Mechanical and thermal straightening of welded structures
- Performing material tests and documentation
- Apply corrosion protection to welded joints and structures
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards

Basic module + chipping:

- Creating, programming and modifying programs for computer-aided manufacturing (CNC) machine tools and manufacturing equipment according to relevant standards
- Adopting and adjusting of computer-aided (CAD) program designs into manufacturing (CAM)
- Determining the processing parameters and choosing the associated editing tools
- Set-up, installation and operation of machine tools and manufacturing systems for machining of materials
- Maintenance and servicing of machine tools and manufacturing systems for machining of materials

- systematic prospecting, containing and eliminating errors, defects and malfunctions in machine tools and manufacturing systems for machining of materials
- Collection and documentation of technical data on the progress of work and for the results
- Performing the work, taking into account the relevant safety standards, environmental and quality standards
- Advise customers about the operational quality management.

Within the training order, the learning steps for each of the competencies are described in detail. In addition to the subject specific competences interdisciplinary areas of expertise (e.g. for the company, the apprenticeship system itself, for methodological competence, social and personal skills and work attitude) are formulated.

The training regulation is the basis for both the training in the company and the curriculum for the vocational school and also includes arrangements for the final exam. The exam is divided into a theoretical and a practical test. The theory test comprising objects technology, applied mathematics and technical drawing.. It may be omitted if the candidate has successfully completed the last class of the vocational school or has demonstrated the successful completion of an medium- or upper level secondary technical and vocational schools which replaces the apprenticeship. The practical examination includes the objects audit work and technical discussion.

The theory test must be made in writing and before the practical test. The test shall include tasks in the following areas:

- In technology: Materials Science; Fundamentals of mechanics (statics, dynamics, strength of materials, hydraulics, thermodynamics); Operation, materials and auxiliary materials; Tools, machines, devices and equipment; Manufacturing Engineering, pneumatics and hydraulics; Job preparation, work flow and quality control (duration max. 80 minutes)
- In Mechanical Technology: Fundamentals of mechanics (statics, dynamics, strength of materials, hydraulics, thermodynamics), operation, materials and auxiliary materials; Tools, machines, devices and equipment; Manufacturing technology; Job preparation, work flow and quality control (duration max. 80 minutes)
- In Applied Mathematics: Mathematical Foundations (length, area, volume and angle calculations); Calculations for mechanics (such as labor, effort, heat, power); Manufacturing engineering calculations (such as cutting speed, power, speed); Calculations to the drive (such as gear calculation, V-belts calculation) (duration max. 80 minutes)
- In technical drawing: The test includes the making of a production drawing of a mechanical part (duration max. 80 minutes).

The audit work is based on the execution of a company work order. This includes knowledge and skills that are taught during the training modules according to the agreed contract of apprenticeship. Part of the work order are work planning, measures to ensure safety and health at work, as well as any necessary measures for environmental protection and quality control. The individual steps in the execution of the work order shall be documented. The work order must be formulated so that it can be performed in six hours.

The technical discussion is taken before the entire board of examiners. In technical discussion the examining Commission has to query on issues from corporate practice in accordance with knowledge and skills acquired in the agreed contract of apprenticeship modules. To support the discussion material samples, tools and other demonstration objects can be used. Topics to relevant safety precautions and accident prevention measures are to be included. The technical discussion should last between 15 and 25 minutes.

5. Status quo of the learning outcome orientation in the Austrian vocational system

Learning outcome orientation is a central part of the Europeanization and modernization of the Austrian vocational system. Therefore, the learning outcome orientation is also in the focus of political efforts to implement a strategy for lifelong learning. Parallel to the activities on the NQF the process of developing a LLL strategy for Austria was started as an inter-ministerial initiative. In 2007 submitted "Guidelines for a coherent LLL strategy for Austria" (see, among others CSENDON 2007), the adopted jointly by the social partners in 2007 position paper "Learning for 2008 and the paper submitted by the BMUKK" knowledge - opportunities - competencies. Strategy for the implementation of lifelong learning in Austria "was followed by a broad consultation process, the results and derived concrete dimensions of action in 2009 as" was expert report on the consultation process, "presented (see, CHISHOLM et al. 2010).

In 2011, the responsible ministries³, presented the Austrian strategy on lifelong learning "LLL: 2020", including the key action 10 "process for validation of non-formally and informally acquired knowledge and skills in all sectors of education." This formulated the following objectives:

- Increase the transparency of the entire education system at national and international levels through better comparability of qualifications, regardless of where and how these qualifications were gained.

³ Federal Ministry of Education, Arts and Culture, Federal Ministry of Science and Research, Federal Ministry of Economy, Family and Youth and Federal Ministry of Labour, Social Affairs and Consumer Protection

- Certifiability, visualization and assignability of knowledge, skills and competences acquired outside the traditional educational institutions
- Assessment of formal, non-formal and informal learning processes on their learning outcomes through
- Mutual, institutional and cross-sectoral recognition and transfer of qualifications as a principle throughout the education and vocational training system
- Existence of a comprehensive validation strategy, which also includes the recognition of acquired skills abroad
- Increased within national and international mobility, especially by people with little formal training

At the same time, the strategy paper notes (see strategy on lifelong learning in Austria, 2011, p 46) that in Austria the skill level of people is measured as before based on formally acquired certificates and non-formally and informally acquired learning outcomes have little relevance. Although there are already measures that can be used for the recognition of competences acquired outside formal education, the tools are not yet coordinated and embedded within an overall strategy.

Therefore, the LLL-2020 provides a number of measures to achieve the objectives defined in the scope of the program 10. These include:

- Establishment of 'Qualification responsible bodies', within the framework of the implementation of the NQF
- Further development of curricula and curricula in schools, universities, but also to further education in the direction of learning outcomes in order to allow an assignment on the NQF
- Development of an Austria-wide validation strategy for the comprehensive recognition of non-formal and informal learning with the participation of relevant ministries, the Länder and the social partners
- Implementation of accounting competence models for inclusion and recognition of prior learning and experience.
- Development of audit team skills through appropriate training programs and creation of cross-sectoral quality assurance for the performance assessment process.

Nevertheless, input-oriented descriptions are at least currently prevailing in Austria. Although descriptions of learning outcomes can be found in the educational objectives of the individual training programs or in the descriptions of the educational and teaching tasks, they are almost always very abstract, unsystematic and mostly without reference to validation criteria. This different perspective, the strong teacher-centeredness and the other building logic skills may prove to be inappropriate for the description of learning units.

In connection with the implementation of the European Qualifications Framework (EQF) and the development of the National Qualifications Framework (NQF), however, a tendency for increased description of learning outcomes can be observed.

In 2005, the Federal Ministry of Education initiated a project to develop educational standards for general and vocational core subjects. This is to ensure that the learning outcomes of students in core areas remain similar - regardless of individual or school-free implementation of training programs. The educational standards formulate demands on the problem-solving capacities and on the teaching and learning in order to ensure the placement of basic skills. The desired learning outcomes are described in terms of technical and multidisciplinary skills that students should have acquired up to a certain grade, and also are of great importance for the further education and vocational training. Educational standards consist of a competency model for each subject or subject area. However, since the educational tasks of vocational schools go beyond these core competencies, the standards generally cannot be used to assessing individual students or for a school ranking.

The focus is on job-related competencies and on the competencies needed to work in a profession or field. The target for all occupations common structure of the competency model should be based on three dimensions: knowledge, action and personal as well as general-professional competence.

In individual initiatives competency models have been developed and are already being tested. For example, a competency model for the agro-food and tourism department has been developed which sets Vienna-wide training standards. In it, the focus is directed to the competences to be acquired to ensure adequate preparation for the labor market. The following competency classes were developed: expertise (including methodological skills), social skills (including communicative competence), individual competence (including creative skills) and implementation expertise.

Up to now, learning outcome orientation has not been established systematically in the apprenticeship system. While it is often argued that in the apprenticeship competence orientation takes place *per se* because of their immediate and strong practical orientation and alignment to the operational reality and also the practical skills assessment at the end of the apprenticeship, the challenge remains in the formal foundations to anchor learning outcome orientation in the training and examination regulations accordingly in order to make them operationally defined and verifiable, in particular against the background of the aspirations for greater transparency and national and international comparability of qualifications.

In order to develop competence and learning outcomes-based education order successfully, it requires three preconditions:

First, in the training regulations skills and competences to be acquired by the trainees mandatorily have to be defined as a minimum standard. The competence-based description have to take into account the technical, methodical, social and personal dimension.

Second, in the training regulations competences must be described as learning outcomes-oriented. These learning outcomes represent an important tool to improve the flexibility of training regulations, because in this way the focus is placed on the goal of education, which gives more leeway to the company. By learning outcomes orientation the focus on the curricular level can be changed from the input to the output control.

Third, vocational skills are to be considered always in the context of business processes. Therefore the working and business processes have to be the starting point for content structuring and bundling of training content and the skills to be acquired.

The paradigm shift in the apprenticeship from the input to output orientation seems to be manageable. The following factors affect it positively (see PETANOVICH et al 2014):

In vocational education and training, the professional profile has a structure according to knowledge and skills. The professional profile lists the competences an apprentice can run professionally, independently and responsibly after his company and school education. The foundation for the description of qualifications in terms of learning outcomes is thus already set for the operational part of the training. Nevertheless, a further development towards genuine learning outcomes is necessary.

With the modularization that was anchored in January 2006 in the BAG⁴, a first step towards a qualification classification in units was set. Although the Austrian conception deviates from the usual definition of modularization in Europe, a certain awareness of a "modular system", however, was created with it. For the implementation of ECVET this may prove to be beneficial.

A range of occupations, primarily from the commercial and administrative area, show a stronger sequencing in units. E.g. in the apprenticeship profession operating services the professional profile is divided in ten units (e.g. "managerial accounting"), and some sub-units (e.g. "cost accounting and calculation", "taxes and payroll", "accounting", "payment" and "accounting"). This type of structure is very close to the proposed representation of qualifications in units of learning.

However, there are some factors in apprenticeship training to counteract a consistent implementation of learning outcomes:

The curriculum for the school part is formulated largely in an input-oriented way. The instructions are not defined in terms of knowledge, skills and competences of the learner's perspective. It is, rather, a list of topics that the teacher must deal with in the context of teaching. For the implementation of outcome orientation and ECVET this form of the formulation is proving a hindrance. A restructuring of the curricula in the direction of learning outcomes would be required in schools.

⁴ Vocational Education Act.

Although school and work training form a unit, the training content is presented in separate documents. "Duality" therefore often is characterized in terms of "separation" and not, as originally intended, as a "supplement". For description of a whole qualification in learning units, as provided for ECVET, this separation could prove to be a hindrance. In fact it is irrelevant where the skills are acquired - it's all about the learning result.

This separation can also prove to be a hindrance in regard to the determination of the responsible authorities. Due to the different responsibilities there are two learning outcome descriptions (each of partial qualifications) by two competent bodies / authorities that make up the overall qualification only in combination. Also here the "separating element" is visible and thus the emphasis on the place of learning.

In recent years, there were, however, initiated a number of projects to accelerate the turn to the learning outcomes in apprenticeship training.

In Austria the model "expertise with systems" (KmS) has been developed, that puts the professional training of the Labour Market Service (AMS) in the context of formal educational qualifications. KmS shall enable people seeking employment to pick up the skills that are necessary to acquire a formal degree by the way of an extraordinary final exam via passing several training modules. KmS is an example of how the model of competence orientation can be implemented in the formal design of dual training and at the same time shows how the apprenticeship system can be used flexibly for the qualification of further target groups in the context of labor market and employment policies.

The AMS initially selected four apprenticeships. For those professions a KmS model has been developed (retail trade, IT Retail, Information Technology, Hotel & Hospitality Assistant). First, a competency matrix was constructed for each apprentice profession, which maps all the contents of the statutory teaching regulation. The work was carried out by the ibw Austria - Research & Development in VET (ibw) in cooperation with the Austrian Institute for Research on Vocational Training (öibf). In the matrix, there are those areas of competence of the profession, which are described in the training regulations. For each of these areas of expertise, there are three skills development stages, the respective preceding level is implicitly included in the next. The level 3 in the competence matrix corresponds to the level the final exam. This is to ensure that the KmS model can be easily classified in the future National Qualifications Framework (NQF).

The next step is to develop meaningful training modules that represent a subset of the competence matrix and form at the same time on its own qualification for taking up work. Participants can reflect their previous acquisition of skills during the entire training period. At the end of each training block a so-called "skills check" is held, at which representatives of the economy are involved, and which reviews whether the participants have reached the target competencies described in the matrix have for each education module. If this is the case, the graduates will receive a certificate.

6. Conclusion

Although Austria is one of the top countries in the European Union in regard to fighting youth unemployment and preparing a smooth transition from school to employment and despite the long tradition of vocational education and training, there is room for improvement especially in the apprenticeship system in regard to quality assurance and learning outcome orientation. The next years will show whether the various approaches to improve the system and to establish a change of paradigm towards learning outcome orientation will be successful.

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