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A comparative study of national systems of formal vocational training in Poland, Germany, Portugal on the examples of electrician and car mechanic professions, taking into account European and national qualifications frameworks

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Chapter 1

The national system of formal vocational training in Poland on the examples of electrician and car mechanic professions

1.1. The structure of the vocational training system

In the education system, vocational education takes place in the following types of secondary schools (public and private), including teaching in a profession (Education Act, art. 9, section 3):

- **three-year basic vocational school**, where after passing the vocational qualification examinations pupils are able to get diploma that confirms their skills in certain job, as well as further education starting from the second class of secondary school for adults;
- **three-years of high school**, which enables pupils to get certificate after passing the Matura exams;
- **four-year technical school**, where pupils are able to get a vocational qualification diploma after passing the examinations which confirm qualifications in the certain profession, as well as obtaining the certificate of maturity after passing the matriculation examination;
- **post-secondary school for people with secondary education**, a study period that lasts 2,5 years, which allows to obtain a vocational qualification diploma after passing the certain exams that confirm qualification in the profession;
- **three-year of special school that is focused on adjusting pupils to work**, it is directed to students with mental disabilities (moderate or significant level) as well as for students with multiple disabilities, which enables pupils to obtain a certificate of adoption to work.

In the school system there are also **four types of schools for adults**:

- **primary school for adults**,
- **gymnasium for adults**,
- **high school for adults and post-secondary school for adults**.

In these schools are used separate standards of educational organization and are accepted only people who are 18 years or 18 years ending in the calendar year in which they are taken to school (Education Act, art. 3, paragraph. 1).

Adults have the opportunity to gain general education with certain skills for the specific job qualifications in non-school system, particular on professional qualification courses.

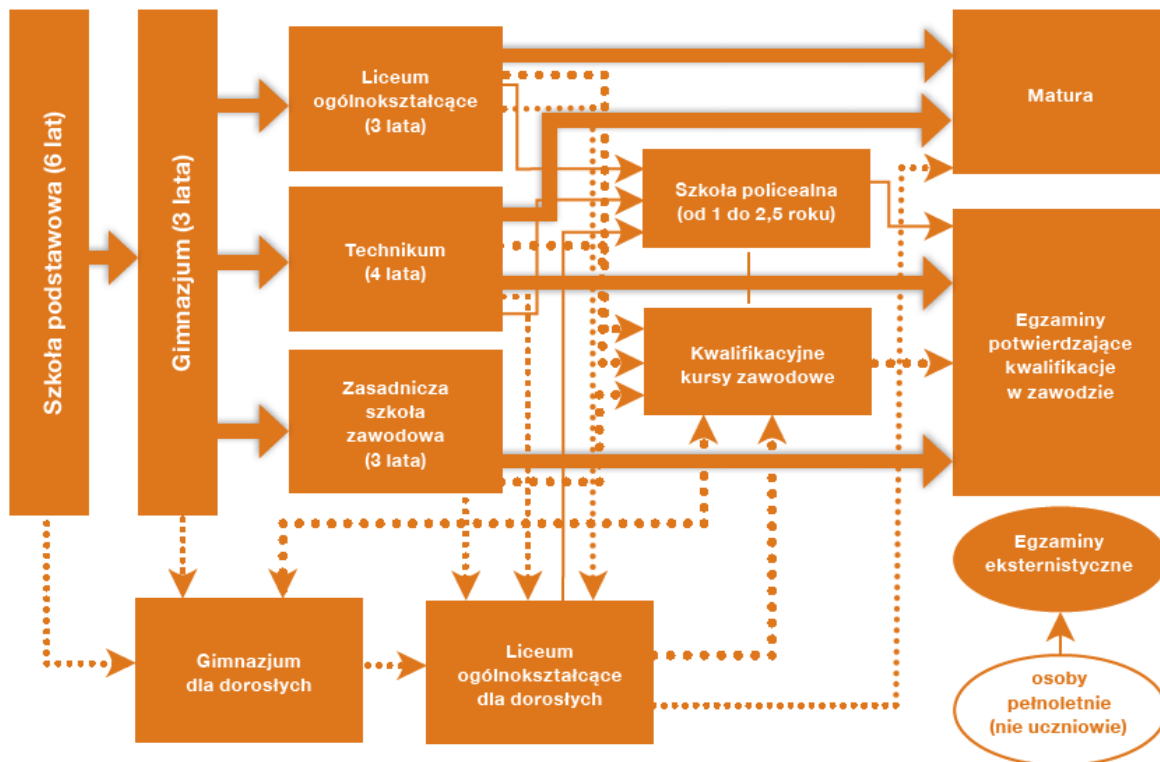
The organizer of professional qualification courses may be (*Reform of the vocational training system in Poland – that includes main aims and expected results*, the Department of Vocational and Continuing Education, Ministry of Education, Warsaw 2012):

- public schools offering vocational training in the area of profession in which the train;
- non-public schools with the rights of public schools, lead vocational training in the field of professions they train;

- public and private institutions of continuing education, further education practical training centers and vocational training;
- labor market institutions, referred to in art. 6 of the Act of 20 April 2004. about promotion of employment and labor market institutions which operate the education and training system (including OHP);
- legal and natural persons who conduct educational activity within the business in local economy.

Education in the profession of electrician and car mechanic takes place within a three-year vocational school.

Fig. 1. Structure of the Polish vocational education system



Source: vocational training and continuing handbook. National Centre for Supporting Vocational and Continuing Education, Warsaw 2013, p. 8

1.2. Basic regulations about vocational training system

The main low legislation about vocational education system is the **Education System Act** from 7th of September 1991. (Consolidated text : Dz. U. of 2004. No. 256, item. 2572, as amended. D.) and Act from 19th of August 2011 about changes in the act on the education system and certain specific acts (Dz. U. No 205, item. 1206).

Proper implementation of the statutory tasks related with vocational education requires knowledge of the acts, regulations and laws issued by the minister in charge of education:

- regulation of the Minister of National Education of 23 December 2011. on the classification of vocational education training (Dz. U. of 2012. Pos. 7, as amended. D);
- regulation of the Minister of National Education of 7 February 2012 about the issue of curriculum of vocational education (Dz. U. pos. 184);
- regulation of the Minister of National Education of 27 August 2012. on the issue of curriculum and general education in particular types of schools (Dz. U. pos. 977);
- regulation of the Minister of National Education of 11 January 2012. about lifelong learning in all forms outside schools (Dz. U. item. 186, as amended. D.);
- regulation of the Minister of National Education of 7 February 2012. on framework curricula issues in public schools (Dz. U. pos. 204);
- regulation of the Minister of National Education – 21 June 2012 on the acceptance for using in pre-school education programs and curricula as well as school textbooks (Dz. U. pos. 752);
- regulation of the Minister of National Education of 11 January 2012 about external examinations (Dz. U. pos. 188);
- regulation of the Minister of National Education of 30 April 2007. about the conditions and assessing, classifying and promoting pupils and students and conducting tests and main examinations in public schools (Dz. U. No. 83, item. 562, as amended. D.) ;
- regulation of the Minister of National Education of 28 May 2010. about certificates, diplomas and other school forms (Dz. U. No. 97, item. 624, as amended. D.);
- regulation of the Minister of National Education of 15 December 2010. about practical vocational learning (Dz. U. No 244, item. 1626);
- regulation of the Minister of National Education of 16 July 2012. On cases in which a public or non-public schools for adults can take a person who has completed 16 or 15

- years, or a person who has graduated from high school, can meet the obligation learning by attending qualifying vocational course (Dz. U. pos. 857);
- regulation of the Minister of National Education of 14 September 2012. On apprentice examination, master's examination and an examination carried out by the examination committees of Chambers of Trade;
 - regulation of the Minister of National Education of 17 December 2010 about the basic conditions necessary for the implementation by schools and teachers tasks, education, care and teaching programs (Dz. U. of 2011. No. 6, pos. 23);
 - Regulation of the Minister of National Education of 20 December 2003. On the accreditation of institutions and centers that provides lifelong learning in all school forms (Dz. U. No 227, item. 2247, as amended. D.);
 - regulation of the Minister of National Education of 7 October 2009. On pedagogical supervision (Dz. U. No. 168, item. 1324, as amended. D.);
 - regulation of the Minister of National Education of 12 March 2009. On the specific qualifications required from teachers and the definition of schools and cases in which you can hire teachers with no higher education or completed teacher training faculty (Dz. U. No. 50, item. 400) ;
 - act of 26 January 1982. – Teacher's Charter (Dz. U. of 2006. No. 97, item. 674, as amended. D.).

In addition, the proper organization of vocational training of young people and adults requires knowledge of legislation listed below:

- act of 22 March 1989. On craft (consolidated text .: Dz. U. of 2002. No. 112, item. 979, as amended. D.);
- regulation of the Minister of National Education of 14 September 2012. On apprentice examination, master's examination and an examination carried out by the examination committees of Chambers of Trade (Dz. U. 2012, pos. 1117);
- Act of 20 April 2004. about the employment promotion and labor market institutions (Dz. U. of 2008. No. 69, item. 415, as amended. D.);
- act of 26 June 1974. - Labor Code (consolidated text .: Dz. U. of 1998. No. 21, pos. 94, as amended. D.);
- act of 5 June 1998. about Voivodeship government (consolidated text .: Dz. U. of 2001. No. 142, item. 1590, as amended. D.);

- act of 5 June 1998. County government (consolidated text .: Dz. U. of 2001. No. 142, item. 1592, as amended. D.);
- act of 8 March 1990. Local Government (consolidated text .: Dz. U. 2001. No. 142, item. 1591, as amended. D.);
- minister of Labor and Social Policy regulation about the classification of professions and specialties for the needs of the labor market and the scope of its application on 7 August 2014. (Dz. U. item. 1145);
- regulation of the Council of Ministers of 28 May 1996. On the vocational training of young people and their remuneration (Dz. U. No. 60, item. 278, as amended. D.).

1.3. The position of electrician and car mechanic occupations in the Classifications of Vocational Education Occupations/Classification of Occupations

Classification of vocational education occupations is a structure of tabular layout including: names of professions taught in the school system, ordered by size of groups, medium and large compatible with the names of the groups established in *the classification of professions and specialties for the needs of the labor market*, the applicants – authorities. On the request of which introduced professions to the classification, the areas of education, types of secondary schools, the names of the qualifications identified in the profession, the ability to provide education in vocational courses.

A characteristic feature of the current vocational education is the separation of the certain skills or individual qualifications, each of them includes a certain amount of knowledge, skills and personal and social competencies, identified in the curriculum in certain profession. Each qualification can be separately confirmed in the educational process as well as in the system of external exams.

Table 1. Location of the car mechanic profession in KZSZ/according to groups names. Classification of Occupations (a piece of proper classification)

Symbol	Occupation name	The applicant Minister competent for the profession	Education area	Types of schools			The names of qualifications separate competitions	Education in the form of qualification courses professional
				Z S Z	T	S P		
1	2	3	4	5	6	7	8	9
74	Electrical and electronic							
741	Electricians, builders, electricians and elektro-mechanic							
741103	Electrician	economy	E	X			K1. Installation and maintenance of machinery and electrical equipment K2. Installation and maintenance of electrical installations	X X

Source: Own calculations based on the Regulation of the Minister of National Education of 23 December 2011, on the classification of vocational education training (Dz. U. of 2012. Pos. 7, as amended. D.)

Table 2. Location of the car mechanic profession in KZSZ/according to names in Classification of Occupations (a piece of proper classification)

Symbol	Occupation name	The applicant Minister competent for the profession	Education area	Types of schools			The names of qualifications separate competitions	Education in the form of qualification courses professional
				Z S Z	T	S P		
1	2	3	4	5	6	7	8	9
7	Industrial workers and craftsmen							
72	The workers Metal, machinery and related trades workers							
723	Machines and equipment mechanics							
723103	Car mechanic	Economy	M	X			K1 Diagnosis, repair of car components as well as assemblies of vehicles.	X

Source: Own calculations based on the Regulation of the Minister of National Education of 23 December 2011, on the classification of vocational education training (Dz. U. of 2012. Pos. 7, as amended. D.)

Name of symbols in chart 1 and 2

T	four-year technical school for youth in the curriculum of secondary school
ZSZ	3-year basic vocational school for youth in the curriculum of secondary school
SP	post-secondary school on the curriculum of a school which offers secondary education
M	the area of education mechanical and mining-metallurgical
E	the area of education electro-electronic

*

1.4. Location of electrician and car mechanic job in the European classification of skills, qualifications and professions of ESCO , the European Qualifications Framework, Polish Qualification Framework

Electrician and car mechanic location in the European classification of skills/competencies, qualifications and professions ESCO

ESCO (under construction) – multilingual classification related with specific professions/jobs, specific skills and competencies . ESCO classification is based on three pillars:

1. professions area,
2. skills / competencies area,
3. qualifications area.

Table 3. Structure of the Polish Classification of Occupations for the needs of the labor market (KZiS 2010-based version of ISCO-08) – an example of a pillar electrician by profession

Symbol KZiS 2010	Group / occupation in KZiS 2010	Symbol ISCO-08	Group name w ISCO-08
74	Electrical and electronic	74	Electrical and electronics trades workers
741	Electricians, builders, electricians and elektromechanic	741	Electrical equipment installers and repairers
7411	Building and related electricians	7411	Building and related electricians
741103	Electrician (school profession)	7411	Building and related electricians

Source: Classification of Occupations of 2014., Regulation of the Minister of Labour and Social Policy of 7 August 2014 year (Dz. U. of 2014., Pos. 1145). Regulation shall enter into force on 1 January 2015; International Standard Classification of Occupations ISCO-08. International Labour Office, Geneva, 2012, p.289-290, 299-300

Table 4. Structure of the Polish Classification of Occupations for the needs of the labor market (KZiS 2010-based version of ISCO-08) - an example of a pillar professional car mechanic

Symbol KZiS 2010	Nazwa grupy/zawodu w KZiS 2010	Symbol ISCO-08	Nazwa grupy w ISCO-08
7	Craft and ralated trades workers	7	Craft and ralated trades workers
72	Metal, machinery and related trades workers	72	Metal, machinery and related trades workers
723	Machinery mechanics and repairers	723	Machinery mechanics and repairers
723	Machinery mechanics and repairers	723	Machinery mechanics and repairers
7231	Motor vehicle mechanics and repairers	7231	Motor vehicle mechanics and repairers
723103	Motor vehicle mechanics and repairers	7231	Motor vehicle mechanics and repairers

Source: as above

Electrician and car mechanic location in the European Qualification Framework (EQF) and the Polish Qualification Framework (PRK)

The European Qualifications Framework (EQF) is a common European reference point, which main task is to link national qualifications operating systems in the individual countries. The main aim guiding of the study were: to promote citizens' mobility between countries and indicate the benefits associated with the idea of learning throughout life (*European classification of skills/competence, qualifications and professions ESCO as leverage to adapt education to the needs of the labor market*, Iżycka H., Marshall A., Ministry of Labor and Social Policy, Labor Market Department, Warsaw, 2011, p. 37).

In the Polish Qualification Framework (PRK), similar to EQF, stands out eight levels of qualifications. Each of the levels PRK has been characterized by general learning outcomes required for a certain level of qualification, that is knowledge, skills and social competence. Polish solution is unique because it characterised two-stage levels (Table 5). The first level description (universal) applies to all types of education. Then they are developed to the second level in many variants typical for general education; for level 5 PRK, which is not typical for vocational education and training; typical for higher education; typical for vocational education and training. The characteristics of the levels of first and second level should be read together (*Polish Qualifications Framework*, Chłoń Domińczak A., S. Slawinski, Kraśniewski A., E. Chmielecka Educational Research Institute, Warsaw 2015, p. 4).

Occupations: electrician and car mechanic are located at 3 ERK

Below are presented typical characteristics of second-level qualifications gained during vocational and training education, level 3 PRK Records – knowledge, skills, social skills – must be related to a specific professional activity.

Table 5. Characteristics of PRK defines level 3, typical for vocational training in the following professions: an electrician and car mechanic

	Descriptive categories	Aspects of primary importance	Level 3
			knows and understands
Knowledge (W)	Theories and rules	Methods and solutions ia	the basic concepts and terminology for professional tasks
		economy activity	elementary principles of individual business and businesses
		Ethics	
	phenomena and processes	properties and conditions	phenomena and processes for professional tasks
	Work rganization	methods and technology	Standard methods and technologies used in the performance of professional tasks
		Operating solutions	Standard organizational solutions used in the performance of professional tasks
		Health and safty working rules	rules, standards and safety procedures relating to the performance of professional tasks
	Tools and materials	accions	principles of operation and use of tools, machines and equipment used to perform complex tasks not very professional
		features	Basic features of the materials used and manufactured products
Skills (U)	Information	documentation	use the documentation for not very complex professional tasks
		Calculation, analysis, synthesis and predistione	search, compare, evaluate and analyze the information needed to perform professional tasks
			Make not too simple calculations related professional tasks
	Work organization	Planning and plans adjustment	prepare and adjust according to circumstances too complex plan to perform professional tasks
		accomplishment	perform actions that make up the rather complex task unions
			organize the work of a small team of employees not performing complex professional tasks
		correcting actions	solve simple problems encountered during the execution of complex tasks not very professional
		Information distribution	receive and transmit information needed to carry out complex tasks not very professional

	Tools and materials	Using goods	organize jobs related to the performance of complex tasks not very professional, with regard to safety
	Learning and work development	Self development	analyze jobs for their competence and their own professional development
independently establish contacts with potential employers			
			I ready to :
Kompetencje społeczne (K)	Follow rules	Rules, instruction and law	act in accordance with the provisions that relate to perform professional tasks
			reliable information on matters relating to occupational tasks
			adherence to the arrangements for cooperation in carrying out professional tasks
	Cooperation	communication	communication in the work environment without disrupting the flow of information to perform their professional tasks
		Relationships in a professional environment	teamwork to perform their professional tasks
	responsibility	Ethical standarts	reliable carrying out professional tasks
			taking into account the direct and deferred in time the effects of how to perform professional tasks
			controlling quality in the performance of professional team, in which the works
			taking responsibility for the tasks entrusted to professional

Source: Polish Qualifications Framework, Chłoń Domińczak A., S. Slawinski, Kraśniewski A., E. Chmielecka Educational Research Institute, Warsaw 2015, p. 10

1.5. The institutions involved in the process of vocational education

In Poland there are many institutions involved in the process of major changes in vocational training, among them are changes of curriculum guides, guides, manuals, and other kinds of training. The attention is focused to the accuracy and efficiency of education, quality of education by adjusting the directions of education to the requirements of rapid changes on the labor market.

Depending on the privileges granted by law , we can distinguish several levels of institutional responsibility for the operation and development of the vocational education system:

System level (Minister of Economy, Minister of Education, Minister of Labor and Social Policy, the Central Examination Board)

On the initiative of the Minister of Economy was signed in Warsaw on 23 January 2015 the agreement between the Minister of Education, Minister of Labor and Social Policy and the Ministry of the Currency on cooperation in the field of vocational training. The agreement involves primarily widely understood promotion of vocational training. It also supports the development of educational and counseling – training and inspire employers to become involved in the development of education in as well as vocational schools and techniques.

Preparing and conducting external examinations which confirm specific knowledge, skills and competencies at the level of lower secondary school, matura exams and professional examinations is the task of the Central Examination Commission. The Commission which operates a certain budget, organize trainings for candidates and examiners, working with employers in the process of examination tasks.

This cooperation aims at:

- 1) provide a coherent, complementary activities for the development of vocational training, suitable to the needs of employers, local labor markets, modern and innovative economy,
- 2) the promotion and development of cooperation between schools and employers in vocational training and increment of involvement of employers in the physical learning skills.

Inter government agreement was due to adjust the educational offer to the needs of employers. It's about better cooperation between science and business. The agreement's aim is to provide complementary actions for the development of vocational education because the vocational education only makes sense if it is a response to the needs of the labor market. Thanks to this cooperation as well as an information exchanging is possible a reactivation of vocational education. Students have to acquire practical skills on real workplaces in proper companies. Introduced on 1 September 2012 changes in the system of vocational education arise from the needs of the Polish economy and labor market, related to development strategy of the country and regions and our obligations as a Member State of the European Union. The changes are reflected in the Act of 19th of January 2011 in Act on the Education System and other acts published in the Journal. Laws No. 205, item. 1206.

The Ministry of Education also performs pedagogical supervision and coordinates the entire modernization area on the level of qualifications related to solutions for the education development in a modern way and practical cooperation with employers in order to meet the needs of the labor market. What is more it works on the development of more tools to examine the competence and professional adjustments. The Ministry also introduces changes of curricula, teaching programs for different types of schools and professions. The new textbooks and other necessary documentation are also changed. In contrast, the development of national standards of professional belongs to the competence of the Minister of Labor and Social Policy. It should be added that according to the Council of Ministers from the 7th of December 2015 in issue of establishment the Ministry of Development with the abolition of the Ministry of Economy, the tasks of this department have been divided between the Ministry of Development and the Ministry of Energy.

The level of the region (School Superintendent, District Examination Commission)

Superintendent of Schools undergo to the Minister of Education, which directly supervises the pedagogical education offices, on behalf of the Governor perform tasks included in law and regulations in the area of province. Superintendent of Education offices undertake various activities in the field of counseling, to support the recruitment process to secondary schools and to provide broad information on the forms and directions of vocational training opportunities. To acquire professional qualifications, as well as need of regional and local labor market. These activities should be directed to high school students and their parents.

Regional Examination Commission (OKE) are part of the external examinations conducted by the Central Examination Commission and also carry out training of candidates for examiners based on the materials prepared by the Central Examination Commission. Superintendents Education offices carry out their statutory tasks in close cooperation with the OKE.

Local level (leading body, the school, Continuing Education Centre or Centre for Vocational and Continuing Education)

The main tasks of main authorities are related to school work supervision and educational institutions arise in principle conferred on its responsibility and competence referred to in article 5 paragraph 7 and article 34 of the Act of 7 th September 199 about Education System consolidated in text. OJ 2004. No. 256, poz.2572 as amended.)

The frames of this supervising includes in particular:

- - management of budgetary resources,
- - working schools in order to Health and Safety conditions ,
- - school or institution organization.

Administrative matters and funding decisions schools are the issue of consultation between schools and the authorities , which is part of local government unit, in the case of secondary schools, including vocational are district offices or city halls. Procedure of controlling the school authorities is based on the regulations of the local government units particularly described detailed rules (criteria, goals, etc.) or send to a separate control regulations. School is managed by the director, who represents school outside, is also the superior of all employees (teachers and the staff)as well as chairman of the school board.

Director takes care of the young learner in school.

Schools can choose teaching programs or develop their own based on the current educational curriculum. They can choose the textbooks approved by the Ministry of Education, as well as to decide on the methods of teaching. Set of educational curriculum that is obliged at school is approved by the school director.

Schools should implement new systems of vocational education corresponding to the needs of the labor market.

Public institutions of continuing education are The Continuing Education Centres (CKU). The working structure of these centers is to conduct lifelong learning at any of school forms, as well as at schools for adults.

The main tasks of these centres are :

- the development and dissemination of methodical and teaching supplements relevant to the training they receive,
- preparing educational offers addressed to the participants of this type of education in order to increase their chances of finding employment and cooperation in this regard with the employers,
- collection of scientific and technical information for the need of lifelong learning education with particular emphasis on directions and forms of education,
- conducting practical training of job as a result of school education program of a certain profession.

CKU cooperate with labor offices in terms of organizing training courses for the unemployed and employers in the lifelong learning of employees.

Institutions level – vocational school - plans, education curricula, cooperation with employers

Vocational schools implement programs of vocational education based on centrally developed educational curriculum. As a good example of this can be developed programs and educational curricula in a modular and subjects area by the National Centre for Supporting Vocational and Continuing Education (KOWEZiU), which is the institution that implements the program „Improvement of curricula key to the modernization of vocational education”. Its main aim is to improve the quality of vocational education through the modernization and revision of education curricula taking into account adjustment to the economy based on knowledge and in accordance with the planned programmatic and organizational changes in vocational education. Under the supervision of the Ministry of Education KOWEZiU fulfill the program „Vocational positive choice”.

Many Polish employers have difficulties to recruit the proper employees. The reason for this phenomenon is the mismatch qualifications to the labor market needs. Vocational education is going through a substantial changes in the program that will improve the quality and effectiveness of education, among others are maintain closer cooperation between educational institutions and employers.

It is worth emphasize that the most common forms of cooperation, apart from extra-curricular activities and professional practice are: consultation, obtaining training materials, organizing subject trips as well as organization of a school competitions and national contests for students.

1.6. Description of the electrician and car mechanic profession

Based on the Regulations of the Minister of National Education of 7 February 2012 (electrician profession) and of 16th of January 2015 (car mechanic profession) – The base of program in vocational education: 741103 electrician and car mechanic 723103.

The aim of vocational training in the profession electrician and car mechanic is to prepare learners for life in the conditions of the modern world and the ever-changing job market. Changes in the developing environmental and social area are influence on: the idea of economy based on knowledge, the growing participation in international trade, new techniques and technologies, as well as an increase of employers on the level of knowledge and employees skills.

On the base of education curriculum for the vocational education are important integration and correlation of education and training. The appropriate level of general knowledge associated with professional knowledge will provide learners with the opportunity to face the challenge of the changing labor market.

An electrician is a person works on installation, designing of an installation of electrical networks. An electrician can deal with the repairing and maintaining of household appliances and electromechanic`s car.

The aims of electrician education

The education curriculum in the electrician profession includes the following learning objectives:

- 1) installing and commissioning machinery and electrical equipment on the basis of technical documentation;
- 2) performing and commissioning of electrical installations on the basis of documentation;
- 3) evaluation of machinery on the technical condition and electrical installations after assembly on the basis of measurements;
- 4) installing control systems, regulation of machine guarding and electrical equipment on the basis of technical documentation;
- 5) installing and checking the operation of fire protection on the basis of technical documentation.

Electrician job involves the great responsibility for the safety of people who are using the grid or supervised by him device. Therefore, the electrician should have the abilities to concentrate and divided attention, which are very significant technical skills (especially math), and creative thinking.

Synthetic description of electrician profession

Electrician assembles and installs components as well as electrical equipment; diagnoses the condition of the electrical installations, appliances and electrical machines, locates damage and repairs its, selects the security and performs work in power stations and electrical networks in establishments mining, metallurgical, waters transport and railway stations, in factories utilities, manufacturing companies, exploiting machinery , electrical equipment in service establishments and design offices.

Tasks of electrician professional

1. 1.Testing and controlling devices in the production and operation process.
2. Choosing, using, installing and servicing of machinery and electrical equipment and control apparatus and measurement.
3. Installing, using and handling of electricity system.
4. Using of effective protection of electrical equipment against short circuits, overload and overvoltage.
5. Diagnosing the state of components, systems and electrical equipment.
6. Matching, installing and testing of fire protection.
7. Abiding health and safety rules of electrical equipment and electrical measurements.
8. Planning and overseeing the power grid.
9. Participation in the work of project teams.
10. Using the computer technology.

The school undertaking training in the **electrician profession** should have the following educational workshops:

1. workshop of electrical engineering and electronics equipped, among others, in:
 - measurement stations,
 - stabilized power supply voltage,
 - DC transformer,
 - sets of electrical and electronic components,
 - computer Workstation.

2. studio installation and maintenance of electric machines and devices equipped among others, in:
 - positions to manual processing : metals and plastics,
 - autotransformers,
 - measuring instruments and Digital,
 - machinery and electrical equipment,
 - electronic control systems for machinery and electrical equipment,
 - computer stations.
3. studio installation and maintenance of electrical installations enriched, among others, about:
 - positions equipped with openwork or wood walls with dimensions of approx. 2 meters x 2.5 meters.

In addition, each laboratory should have a computer for the teacher connected to a network with Internet access with printer and scanner and multimedia projector.

Car mechanic is a person who is engaged in operation, maintenance and repairing of vehicles used in road transport. For these vehicles include cars, buses, trucks, motorcycles, tractors and motorized vehicles, namely, trailers and semi-trailers.

The main aims of education in the car mechanic profession

Car mechanic you should be prepared to perform the following professional tasks:

1. The use of motor vehicles.
2. Diagnose vehicles.
3. Repair of motor vehicles.

Synthetic description of profession of car mechanic

Car mechanic maintains, performs technical service and repairs engines as well as assemblies and mechanical systems in cars, trucks, buses, motorcycles and other motor vehicles with diagnostic equipment and locksmith tools installing tools.

Tasks professional car mechanics

1. Acceptance of vehicles to repairing and preparation of protocols.
2. Checking the operation of the vehicle and its teams using the diagnostic equipment.
3. Setting and removing faculties of a vehicle systems.
4. Making exchange fluids in vehicle.
5. Checking the wheel positioning of a vehicle.
6. Controlling and setting the lights of the vehicle.
7. Performing works of disassembly, repairing and adjustment of assemblies for the components of the vehicle, including the engine, gearbox, clutch, brake, steering, suspension and more.
8. Washing and cleaning of parts and components.
9. Coping and matching non-standard parts.
10. Checking the quality of the service and repairing work by means of driving and using diagnostic equipment.
11. Organizing , operation and maintenance of clean job with the principles of occupational health and safety, fire protection and environmental protection.
12. Making settlements maintenance costs and repairs.

The school that undertake training in the **profession of car mechanic** should have the following educational workshops:

1. workshop drawing equipped, among others, in computer workstations connected to a local area network with Internet access and a printer with a scanner,
2. workshop vehicles equipped with, among others, in technical documentation, catalog of supplies, diagnostic equipment,
3. diagnostic laboratories equipped with, among others, in position to control and repair of motor vehicles.

To perform professional tasks outlined in **electrician profession** and **car mechanic** are required learning outcomes common to these professions.

1. (BHP) Occupational Health and Safety.
2. (PDG) making and business activities.
3. (JOZ) Foreign language-oriented professionals.
4. (KPS) Personal and social competence.

1.7. Objectives, targets, plans, programs teaching professional electrician and car mechanic for example Vocational School No. 1 of the name of Joseph Psarski in Ostrołęka

According to the methodology of the development of intellectual labor O1 description of the objectives, tasks, plans and curricula in competitions electrician and car mechanic should refer to a specific vocational school leading to an appropriate education. The Vocational School No. 1 was selected in Ostrołęka. This school has a big tradition in the field of vocational training, which roots date back to 1921. As one of the first vocational schools in Poland. The school is of great importance in vocational education in the Ostrołęka subregion where studies the number of more than 1,000 students in the school year 2015/2016.

Vocational School No. 1 of the name by Joseph Psarski in Ostrołęka is an educational institution to a public service. Governing body is the City of Ostrołęka on the low of county rights. In the school year 2015/2016 school education in the following professions:

- 1) Technical: electrical technician, mechanic, technician, energetics, mechatronics technician, logistics technician, technician forwarder, surveyor technician, automotive technician, computer technician,
- 2) Vocational School: car mechanic, electrical engineer vehicles, electrician.

Fields of education determined by the school headmaster in agreement with teachers. The duration of study is four years for Technical and for Vocational School – 3 years. Studying is based on the educational curriculum developed by the National Centre for Supporting Vocational and Continuing Education for:

- 1) Technical: direction – an electrical engineer – curriculum for the profession 311303 on the structure of the present techniques vehicles – curriculum for the profession 311513 on the structure of the substance,
- 2) Vocational School direction – electrician – The curriculum for the profession electrician 741103 on the structure of the substance, car mechanic – curriculum for the profession of car mechanic, 723103 on the structure of the subject.

Undergraduate Technical from faculty of electrician and car mechanic obtains a certificate of Technical graduation and the secondary school certificate after passing the matra examinations as well as permission to use the appropriate title electrical engineer or technician of car mechanic after passing all exams formal qualifications in these profession.

Undergraduate Vocational School studying to become a profession electrician and car mechanic obtains a certificate of completion of the Basic Vocational School that enables skilled worker in the profession of electrician or car mechanic after passing all exams formal qualifications in the profession.

For preparing and organizing of examinations of the profession, responds directly Regional Examination Commission.

The organization and conducting of professional examinations is regulated by the Director of the Central Examination Commission in the form of a statement giving the schedule for conducting the examination of qualification in the particular profession.

Purpose of vocational training

The aim of vocational training in Poland is to prepare students for life in the true conditions of the modern world, performing work and an active role in the changing labor market.

The aim of education student in the profession of **electrician** is to prepare mobile undergraduate to the labor market. A person with qualifications assigned for the certain profession is equipped with current knowledge and professional skills, but also the awareness and the needs for continuing improvements and requires new powers.

The aim of education students in the profession of **car mechanic** is to prepare the undergraduate to work in the field of automotive diagnostics, repairing and operating of modern motor vehicles, which are equipped with electronics and modern technologies.

Timetable for electrician and a car mechanic

According to the Regulation of the Minister of Education in the framework education curriculum for the profession of an electrician in basic vocational school, minimum number of hours for vocational training is 1600 hours, which includes minimum of 630 hours for vocational theories, and practical vocational training 970 hours.

On the base of education curriculum for vocational studies on the faculty of electrician minimum number of hours has been determined for learning outcomes and is:

- Learning results common to all occupations and learning outcomes common occupations within the area of electro-electronic constituting, that are fundamental for training in a profession or group of professions – 350 hours.

- Learning outcomes relevant to qualifications distinguished in the profession:
 - E.7. *Installation and maintenance of electrical machinery and equipment* – 450 hours.
 - E.8. *Installation and maintenance of electrical installations* – 350 hours.

Table 6. Plan for the teaching profession electrician

Lp.	Compulsory education activities	Class						Teaching hours	
		I		II		III		weekly	summary
		I	II	I	II	I	II		
Items in vocational education theoretical									
1	Electrical engineering and electronics	8	4					6	192
2	Electrical machinery and equipment		2	5	5			6	192
3	Electrical Installations				2	3	5	5	160
4	Economic activity in the electrical industry					1	1	1	32
5	Language in the electrical industry					2	2	2	64
Total hours		8	6	5	7	6	8	20	640
Items in practical vocational training									
6	Measurements of electrical and electronic equipment	5	5	4				7	224
7	The test equipment and electrical equipment		2	9	7	8		13	416
8	Electrical installations - practical classes				4	5	11	10	330
Total hours		5	7	13	11	13	11	30	970
Weekly hours of compulsory professional educational classes		13	13	18	18	19	19	50	1610

Source: *The curriculum for the professional electrician, 741,103 of the structure of this type of school: basic vocational school, type of program: linear, Warsaw 2012*

According to the Regulation of the Minister of Education in the case of frame studies for the educational learning for the profession of car mechanic in basic vocational school minimum number of hours for vocational training is 1600 hours, which on vocational training theory will be allocated a minimum of 630 hours, and vocational practice 970 hours. The core curriculum in the profession of car mechanic minimum number of hours for vocational training has been determined for learning outcomes and is:

- 420 hours for the implementation of qualifications M.18. *Diagnosis and repair of components and assemblies of motor vehicles,*
- 400 hours for the implementation of the effects common to all occupations and common occupations within the area of education.

Table 7. Teaching plan for the profession of car mechanic

Lp.	Compulsory education activities	Class						Teaching hours	
		I		II		III		weekly	summary
		I	II	I	II	I	II		
Items in vocational education theoretical									
1.	Machine construction basics	2		1				3	96
2.	Traffic regulations in regards category B			1				1	32
3.	Technology repair of motor vehicles	3		4		4		11	352
4.	Technology repair of electric and electronic systems of motor vehicles			3				3	96
5.	Economic activity in the automotive industry			1				1	32
6.	Foreign language in the automotive industry			1				1	32
Total hours		5		11		4		20	640
Items in practical vocational training									
7.	Diagnosis and repair of motor vehicles	4		6		15		25	810
8.	Preparation techniques	5						5	160
Total hours		9		6		15		30	970
Weekly hours of compulsory professional educational classes		14		17		19		50	1610

Source: *The curriculum for the profession of car mechanic, 723,103 of the structure of this type of school: basic vocational school, type of program: linear, Warsaw 2012*

1.8. Participation of employers

According to Polish law, schools are independent sector of education of vocational learning based on educational programs approved by the school headmaster. In area of vocational education, according to the Regulation of the Minister of National Education from the 15th of December 2010 is organized practical teaching profession in the form of practical classes and apprenticeships.

In the Vocational School Complex No. 1 in Ostrołęka for professions like electrician and car mechanic practical training is realized in the form of practical classes.

For the profession:

- Electrician – educational program in the part of the practical training is carried out in the dimension of 970 hours,
- Car mechanic educational program in vocational practical part is realized in the dimension of 970 hours.

Practical classes are aimed at students to improving skills needed to work in a particular profession.

According to the Regulation of the Minister of National Education from the 15th of December 2010 on the issue of practical vocational training can be organized in school workshops, educational workshops, continuing education centers, practical training centers or employers.

Practical vocational training in occupations like electrician and car mechanic at the School of Professional No 1 is implemented through practical activities in the Practical Training Centre in Ostrołęka.

Practical profession is not the only way to enable employers to cooperate in vocational training. There is increasing expectation that vocational education to vocational training was more concerned with the needs of employers and implemented in cooperation with them.

Examples of forms of cooperation with employers vocational school includes the following catalog (*Cooperation of employers with vocational schools Present and Future*, National Centre for Supporting Vocational and Continuing Education, Warsaw 2013):

- The organization of practical classes students,
- Placements of students,
- Sponsorship of schools in activities that increase students' professional knowledge (eg. Trips to trade fairs),

- Enrichment of the educational base of educational materials in the form of the transfer of equipment classrooms,
- Partnership agreement with the vocational school determines the share of the education process,
- Delivery of materials / raw materials for practical training,
- Consultation and cooperation with employers in the development of curricula,
- Cooperation in the organization of competitions of knowledge and skills,
- The funding of scholarships for students,
- Practical training for vocational teachers,
- Other forms of cooperation between employers and vocational schools.

Analyzing school documents (Statute of the Vocational School No. 1 named by Joseph Psarski in Ostrołęka, concept of school Vocational School No. 1 in Ostrołęka, class schedules) shows that:

- The concept of school work are described in terms of education offered by the school needs to ensure these conditions and vision of the institution,
- IMS in the Statute No. 1 there is no references to the school work with employers.

Despite the lack of formal cooperation with employers, together with the socio-economic school, in the programming period 2007-2013, implemented projects the supported vocational training. Projects such as „Consulting and professional training students vocational school in IMS No. 1 in Ostrołęka to their performance on the job market – edition I” and „Consulting and professional training students vocational school in IMS No. 1 in Ostrołęka to performance on the job market – Edition II” implemented in partnership with the College of Economic and social Ostrołęka, allowed educating students on the car mechanic and electrician part in extra-curricular activities in the form of practical classes in car services and in the form of monthly professional internships in companies complying with the profession. As a result of the projects was establishing the cooperation in the form of bilateral agreements as well as cooperation in the reception of students on apprenticeship.

The school has also cooperation with foreign partners, which are labor market institutions Handwerkskammer Erfurt (Germany), European Career Center Erfurt (Germany), in supporting the professional position of graduates on the German labor market (land Thuringia). In this way, IMS has increased its cooperation with companies not only on the

Polish market , but also on the European roadmap for implementing school on the European dimension of education.

To sum up , despite the lack of appropriate provisions in the strategic documents of school (Statute Vocational School No. 1 named by Joseph Psarski in Ostrołęka , concept of school Vocational School No. 1 in Ostrołęka) , the school cooperates with institutions of the socio – economic development in terms of professional skills students for the labor market.

1.9. Summary

The stability of the vocational training system in Poland provides: cooperating and participating institutions that cooperates in the vocational education system through specific legislation about the new vocational education issue as well as with close cooperation with employers. The European Union financial support opens the possibility of co-financing the vocational schools. One of the activities undertaken within the framework of the regional operational programs for the period 2014-2020 is to create in schools and vocational training conditions that reflects real work environment thanks to strong financial support with this system. These projects include modern equipment and teaching materials for high quality vocational education and enables the high quality of teaching as well as the fulfilling the educational the curriculum. As a result, vocational school becomes a school of positive selection, innovative knowledge, skills and competence. Multidirectional policy of promoting a positive image of vocational education makes better future , allows undergraduates entering the labor market as fast as possible , acquiring its own resources for living and at the same time does not exclude the possibility of further education and career development.

The national system of vocational training is mainly focused on teaching occupations such as car mechanic and electrician with modern and practical teaching methods. What is more cooperation with employers, is very important to forecast development in the labor market and evaluate expectations for future. **Car mechanic** is a profession with a future, associated with the operating vehicles, closely related with technology development , modern industry, service economy and people`s mobility. Car mechanics find employment in the specialized service garages, service stations, diagnostic and repairing stations. Modification of the new basic education curriculum and with them curriculum suitable to the needs of employees allows adding new skills to professions that have already are on the labor market. Promoting dual education and cooperation of employees with vocational education contributed to create a new profession of motorcycle mechanic and enters it to the KZiS. The modern **electrician** uses in daily live basic knowledge of electrical engineering combined with modern computer technology. Electrician is a profession which is very popular, covering the knowledge from the different branches of electrical engineering. This job faces a lot of demands due to the widespread use of this field in all aspects of life. It is hard to imagine a typical electrical device which is not linked to the part of the electronic and mechanical parts, so electrician is partly electronic engineer , automatic engineer as well as IT specialist and mechanic. Bearing in mind the financial perspectives on years 2014-2020, should be

remembered about the role of the social partners who are presented for the vocational education training (professional associations, employers organizations and trade unions), in the process of agreeing the development priorities, using of structural funds to support the development of professional skills on the labor market. The modern car mechanic and electrician are people broadly educated to do these professions and find themselves in a new reality. By knowing foreign languages, they broaden their entrepreneurial skills, mathematics, and other competencies needed in this profession, which ensures the stability of professional and even prevents early retirement from the labor market. Defining the hours of practical training in employers companies should be based on dual education. The development of extra curriculum activities allows vocational schools carry out short educational forms for the single professional qualification as well as collecting them in order to gain a particular profession.

Improving the process of confirmation the vocational education effects (knowledge, skills and social skills obtained in the training process) by improving the organizational issues of vocational exams announcement the terms of exams sessions, written and practical parts. Involving headmasters of vocational schools, supporters or promoters of a good and efficient practices to the training sessions related with organizing exams, using new IT system to support the organization of exams, information expansion in issues related with examinations, completing guide books for the most popular professions, examples of the tasks of the key answers as well as the criteria of evaluation. Amplifying the quality of the vocational training system leads to extending interests in studying on faculty of vocational education which is getting closer to the labor market and allows quicker, more efficient adjustment of new skills tailored to the employers requirements.

With the changes that are taking place in the modern world as well as and the restructuring process in the Polish economy, appears new professions but in the other hand professions like electrician and car mechanic will always be very popular. Constantly improvement on the field of this profession, gives undergraduates the possibility of performing work for many years without necessity for changing the career.

1.10. References

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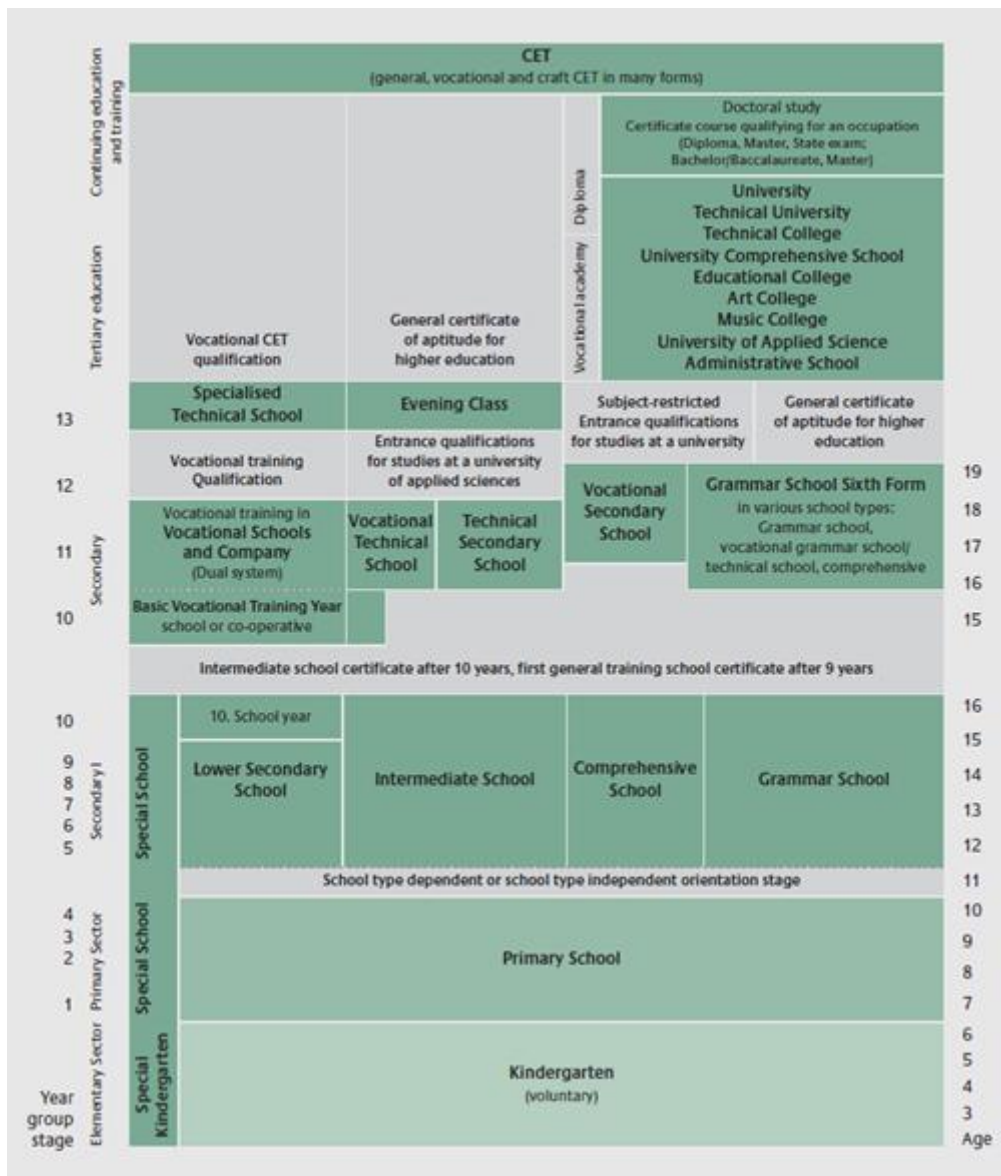
Chapter 2

The national system of formal vocational training in Germany on the examples of electrician and car mechanic professions

2.1. The structure of the vocational education and training system

There are different pathways of vocational training in Germany. Full compulsory education is required for entering such training, that is, candidates must have spent a minimum number of school years (ten as a rule) in general education, which is the sole responsibility of the Federal states. The Federal states bear sole responsibility for school education in Germany. For this reason, there are different types of school. However, the Federal states agree on general standards so that transfers are possible and final qualifications are generally recognized.

Fig. 2. The structure of the Germany vocational education system



Source: Federal Ministry of Education and Research, Status of Recognition of non formal and informal learning in Germany – within the framework of the OECD activity “Recognition of non-formal and informal Learning”, Berlin 2008

The vocational training is mostly performed in the dual training system

Most school leavers (more than 60% of an age group) embark on dual training. Apart from completing compulsory education, there are no formal schooling requirements for entrance to dual training. The candidates' schooling background is, however, an important criterion for most companies when selecting their trainees (*Federal Institute for Vocational Education and Training, VET Data Report Germany 2013 – Facts and analyses accompanying the Federal Report on Vocational Education and Training – selected findings, Bonn 2014*).

The aim is to provide a broadly based knowledge of vocational contents which allow performing the future occupation with high competence.

The name “Dual Training” illustrates the principle: Two partners share the responsibility for vocational education and training: A company concludes a training contract with a young trainee and assumes the responsibility for teaching the required training contents. The company organizes learning on an average of three or four days per week on the basis of a training plan in order to qualify for one of the about 328 nationally recognized training occupations (*Federal Institute for Vocational Education and Training, Index of Recognised Training Occupations, Bonn, 2015*).

They train in the company and at the same time attend part-time vocational school within the prescribed period of two, three or three and a half years.

In-company training familiarizes the trainees with the technological and organizational aspects of the current work processes in companies. In addition, trainees contribute to the company's productivity during their training, which reduces the overall cost of vocational training for both the companies and society at large. The companies bear the costs of the training and pay the trainee an apprenticeship pay as agreed between the social partners of industry (employer association and trade union). The apprenticeship pay rises with each year of vocational education and training. It is about one third of the beginning salary of a qualified person.

The training period can also be extended under special circumstances if this is the only way to ensure that the training objective can be achieved. The criteria for shortening the training period are in particular special previous knowledge acquired at work or school or above-average performance during training.

Trainees attend part-time vocational school on one or two days per week, where they are mainly taught theoretical and practical knowledge related to their occupation; in addition they attend classes on general subjects such as economic and social studies and foreign languages. Systematic teaching at vocational school is a necessary supplement to process-oriented training in the company which is rather more based on specific in-house requirements.

Teaching at part-time vocational school takes complex processes into account as well: Theoretical contents is therefore not taught in isolation but within the framework of so-called fields of learning (see chapter 2), and is related to work in the respective occupation wherever possible.

(see chapter 2, 6 and 7)

2.2. Basic law regulations

The most important conditions of vocational trainings are the free choice and practice of an occupation and are provided for in the Constitution (Grundgesetz: Article 12) and Federal Government competence for out-of-school vocational training (Article 72 (1), (2) and Article 74 (1)).

According to the Constitution the Federation has the right to legislate on vocational education and training. The Vocational Education and Training Act (Berufsbildungsgesetz, BBiG) (reformed in 2005) is another significant legislative document providing for the organisation of out-of-school vocational training. Recent changes of the Act refer to the recognition of the time-limited training periods abroad, the amendment of the Enabling Standard for the promulgation of training regulations by the Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB).

Other important legislations in the German vocational training system are:

- Regulation on Craft Trades (Gesetz zur Ordnung des Handwerks, HwO) (amended 2006): regulates vocational training in greater concurrence with BBiG in crafts trades.
- Ordinance on Trainer Aptitude (Ausbilder-Eignungsverordnung, AEVO) (amended 2009): prescribes standards for the occupational and work-related teaching abilities of instructors.
- Protection of Young People in Employment Act (Jugendarbeitsschutzgesetz, JArbSchG) (amended 2006): contains protective regulations for trainees and young employees
- Works Constitution Act (Betriebsverfassungsgesetz, BetrVG) (amended 2006): prescribes participation rights of work councils in promoting and implementing training measures.
- Social Code, Volume III – Employment promotion: among other issues supports occupational further training, occupational retraining and orientation training.
- Career Advancement Training Promotion Act (Aufstiegsfortbildungsförderungsgesetz, AFBG) (amended 2006): confirms the right to State support of skilled workers who have completed ITVET.
- Law on the Protection of Participants in Distance Education (Fernunterrichtsschutzgesetz, FernUSG) (amended 2011): regulates licensing and form of contract of distance learning courses.

- Directive on recognition and Licensing of Continuing Training (Anerkennungs und Zulassungsverordnung Weiterbildung, AZWV) (amended 2007)

There two main authorities governing the educational system in Germany, including all levels of vocational education and training system: the Federal government and the Federal states (States). Within the Federal government, the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF) is the one responsible for policy, coordination and legislation for: out-of-school vocational training and continuing education; training assistance; general principles of the higher education system, etc.

The Federal Ministry of Economics and Technology (Bundesministeriums für Wirtschaft und Technologie, BMWi) or any other competent ministry may officially recognise training occupations by adopting legislative acts and issuing training regulations for training occupations by agreement with BMBF.

The Federal Institute for Vocational Education and Training (Bundesinstitut für Berufsbildung, BIBB) provides consultancy to the Federal Government and vocational training providers together with conducting research in -company vocational training. It also moderates the dialogue among social partners regarding innovations in vocational training.

At a regional level Federal states Ministries of Education and Cultural Affairs are competent authorities for school education as provided for by the Constitution. The Ministries are obliged to cooperate with each other and with the Federal Government. The cooperation platform is called a Standing Conference (Kultusministerkonferenz, KMK). Its aim is to ensure uniformity and comparability in school and higher education policies. Until resolutions of KMK are approved by individual Federal states parliaments, they remain recommendations and are not legally binding.

The Federal states have committees for vocational training where employers, employee and the highest Federal states authorities are equally represented. Employers, trade unions and the government all play an important role in the decision-making process with regard to education. Their close partnership has great influence on the content and form of the vocational education and training where requirements and interests of the parties involved are taken into account.

Federal and Federal states authorities work together on framework curricula for the dual training system. Their collaboration concerns vocational instruction and training regulations for on-the-job training.

The principles for the promotion and funding of continuing education are set out in the continuing education and employment legislation of the Federal states. The latter recognises the freedom in the preparation of curricula and independence in staff selection of continuing vocational education and training providers.

Collective bargaining contracts, company agreements and contract employment are all continuing education-related issues regulated by Federal states (<http://www.unevoc.unesco.org/go.php?q=World+TVET+Database&ct=DEU>).

2.3. Location of the professions in the national classification of occupation

In order to better reflect the diversity of professions in Germany they are systematically arranged in groups. The goal of developing a new German Classification of Occupations 2010 (KldB 2010) by the Federal Employment Agency was to create an up-to-date and generally accepted classification of occupations for Germany which on the one hand satisfies the pronounced occupation-specific structuring of the German labour market and on the other hand enables linking to the International Standard Classification of Occupations 2008 (ISCO 08) (*Research Data Centre of the Federal Employment Agency, FDZ Methodenreport – the German Classification of Occupations 2010 – structure, coding and conversion table, Nuernberg 2013*). At the moment about 27,000 job titles are assigned to the KldB 2010 (www.arbeitsagentur.de).

The Classification of Occupation 2010 (KldB 2010) is a systematization of occupational activities structured as hierarchical classification with five breakdown levels and grouping occupations according to their occupational expertise (defined by the similarity of the activities, knowledge and skills characterizing them) and their Requirement Level (defined by the complexity of the activities to be performed) (*Research Data Centre of the Federal Employment Agency, FDZ Methodenreport*).

Table 8. The Classification of Occupation 2010 (KldB 2010)

Breakdown level	Digit level	Number of breakdown levels
Occupational areas	1-digit KldB 2010	10
Occupational main group	2-digit KldB 2010	37
Occupational group	3-digit KldB 2010	144
Occupations sub-group	4-digit KldB 2010	700
Occupational types	5-digit KldB 2010	1.286

Source: Research Data Centre of the Federal Employment Agency, FDZ Methodenreport

At the top hierarchy level, the KldB 2010 consists of ten Occupational Areas (1-digit code). Since one digit is not enough to map the complexity of the occupational landscape in Germany, the Occupational Areas do not represent any directly comparable units. They are rather designed to give a good overview of topics and ensure user-friendly handling of the KldB 2010. The Occupational Main-Groups (2-digit code), however, are qualitatively compiled by aspects of contents. The Occupational Areas are not suitable for analytical purposes.

The next three breakdown levels – Occupational Main-Groups (2-digit code), Occupational Groups (3-digit code) and Occupational Sub-Groups (4-digit code) – were defined based on the "expertise" of an occupation which is considered to be the structuring dimension of the KldB 2010. The expertise of an occupation is determined by how strongly the skills, abilities and knowledge required for an occupation coincide in two occupations. Occupations with a comparable level of similarity were combined on the same breakdown levels of the KldB 2010, i.e. all Occupational Main groups, Occupational Groups and Occupational Sub-Groups are characterized by a comparable level of similarity among the occupations combined under them. The deeper the breakdown level, the greater is the similarity among the occupations.

On the 5th, bottom level, the classification structure is broken down on the basis of the Requirement Level – the second dimension of the KldB 2010. The objective is to be able to depict the various degrees of complexity within those occupations which have a high similarity of occupational expertise. The following four Requirement Levels are distinguished to map the degree of complexity of an occupation: 1 = unskilled or semi-skilled activities, 2 = specialist activities, 3 = complex specialist activities and 4 = highly complex activities.

The two recognized occupations of motor vehicle mechatronics technicians and electronics technician for energy and building technology are classified as follows:

Table 9. Motor vehicle mechatronics technicians

Breakdown level	Digit level	Classification title	Number
Occupational areas	1-digit KldB 2010	Occupations in production of raw materials and goods, and manufacturing	2
Occupational main group	2-digit KldB 2010	Technical occupations in machine-building and automotive industry	25
Occupational group	3-digit KldB 2010	Technical occupations in the automotive, aeronautic, aerospace and ship building industries	252

Occupations sub-group	4-digit KldB 2010	Technical occupations in the automotive industries	2521
Occupational types	5-digit KldB 2010	Technical occupations in the automotive industries-skilled tasks	25212

Source: Federal Employment Agency, German Classification of Occupations 2010 – Structure and Classification, Nuernberg 2013

Table 10. Electronics technician for energy and building technology

Breakdown level	Digit level	Classification title	Number
Occupational areas	1-digit KldB 2010	Occupations in production of raw materials and goods, and manufacturing	2
Occupational main group	2-digit KldB 2010	Occupations in mechatronics, energy electronics and electrical engineering	26
Occupational group	3-digit KldB 2010	Technical occupations in energy technologies	262
Occupations sub-group	4-digit KldB 2010	Electricians in construction	2621
Occupational types	5-digit KldB 2010	Electricians in construction-skilled tasks	26212

Source: Federal Employment Agency, German Classification of Occupations 2010 – Structure and Classification, Nuernberg 2013

2.4. Location of the professions in the classifications EQF, GQR and ESCO

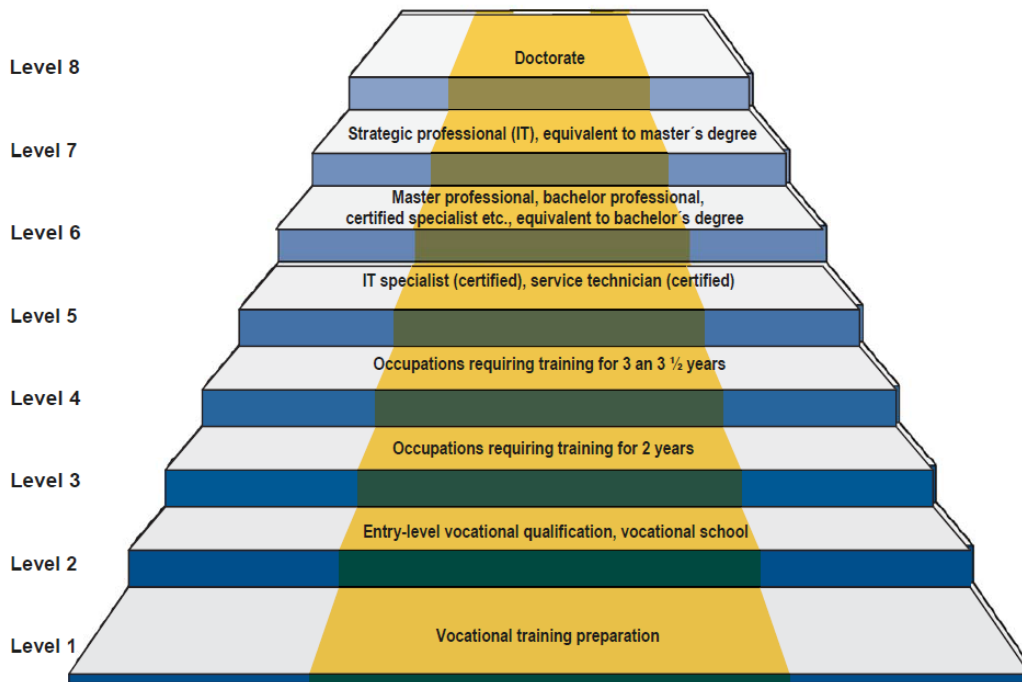
The European and the German Qualifications Framework (GQF)

The EU member states have different education systems with many different qualifications. This makes it difficult to assess which competences a qualification obtained in another EU member state comprises. The EU Commission has therefore developed the European Qualifications Framework (EQF). It aims to create transparency across national borders and therefore promote the mobility of employees throughout Europe. The EQF differentiates between eight qualification levels. The higher the level, the higher are the subjectspecific and personal competences obtained.

On 1 May 2013 the German Qualifications Framework (GQF) came into force. It transfers the eight-level EQF model to the German education system. The concept of competence plays a central role in the GQR reflecting the aim of the German Education System: ensuring full (occupational) competence instead of isolated knowledge and skills. The GQR only assigns special competences to formal educations. Informally acquired competences are not assigned yet (<http://www.dqr.de>).

For graduates of vocational training programmes in Germany the following applies: Vocational education and training qualifications with a two-year training period are allocated to Level 3, vocational education and training qualifications with a three-year and 3 1/2-year training period are allocated to Level 4 and advanced qualifications like bachelor professional (Fachwirt + Meister) and master professional are allocated to Level 6.

Fig. 3. The German Qualifications Framework



Source: Association of German Chambers of Commerce and Industry, "What is the German Qualification Framework", Nuernberg 2013

These advanced qualifications are therefore at the same level as a bachelor's degree from higher education institutions. The respective GQF level and the EQF level corresponding to this are indicated accordingly on training and advanced training certificates (*Association of German Chambers of Commerce and Industry, "What is the German Qualification Framework", Nuernberg 2013*).

The apprenticeship of motor vehicle mechatronics technicians and electronics technician for energy and building technology are both located at level 4. Level 4 describes competences that are needed for planning and processing professional tasks independently. As each level of the GQR is divided in professional and personal competences level 4 includes the following competences in detail:

Expert competences:

Knowledge

- To possess a deeper general knowledge or professional theoretical knowledge in a special learning area or professional field of activity

Skills

- To possess a wide range of cognitive and practical skills which are necessary
 - o for planning and processing tasks independently
 - o for evaluating processes and results of work
 - o to derive action alternatives (if necessary)
 - o to provide transfer services to adjacent areas

Personal competences

Social competence

- being able to interact with colleagues, supervisors and customers
 - o supporting others
 - o justifying processes and results
 - o communicating facts in a comprehensive way

Autonomy

- being able of setting learn and work objectives and to reflect and realize them responsibly

ESCO (European classification of Skills, Competences and Occupations)

Based on the initiative New Skills for New Jobs the European Commission wants to establish a “common language between the labour market and education/training” with the European Taxonomy of Skills, Competences and Occupations (ESCO). In the process, the national classification systems for occupations, qualifications, skills and competences are to be progressively developed and linked with one another.

The ESCO columns are hierarchically structured and linked with International Standard Classification of Occupations (ISCO-08).

The two recognized occupations of motor vehicle mechatronics technicians and electronics technician for energy and building technology are classified as follows:

Table 11. Motor vehicle mechatronics technicians for automobile technology

Breakdown level (ISCO-08)	Group / occupations	Number
1.	Craft and related trades workers	7
2.	Metal, machinery and related trades workers	72
3.	Machinery mechanics and repairers	723
4.	Motor vehicle mechanics and repairers	7231

Source: Research Data Centre of the Federal Employment Agency, FDZ Methodenreport

Table 12. Electronics technician for energy and building technology

Breakdown level (ISCO-08)	Group / occupations	Number
1.	Craft and related trades workers	7
2.	Electrical and electronics trades workers	74
3.	Electrical equipment installers and repairers	741
4.	Building and related electricians	7411

Source: Research Data Centre of the Federal Employment Agency, FDZ Methodenreport

In opposite to the GQR the ESCO / ISCO-classification does not have a 5th breakdown level which depicts the various degrees of complexity within those occupations which have a high similarity of occupational expertise. Furthermore there is no possibility to describe the professional specialization of Motor vehicle mechatronic technicians for passenger cars and the professional specialization of Electronics technician for energy and building technology (<https://ec.europa.eu/esco>).

2.5. Organisations involved in vocational training

The organization of dual training requires a complex but clear division of responsibilities. Employers and unions play a central role in initiatives for change because the structure of vocational training must meet the demands of industry. If there is a need for changes – in the qualification requirements, for example – the Federal Government, the Federal states and industry agree on the basic principles for adaptation. Then the work on the training regulations and framework curricula is continued and constantly coordinated by the individual partners involved.

Federal framework legislation

Action by all stakeholders in dual training (Federal Government, federal states and industry) is governed by the federal framework provisions of the Vocational Training Act (BBiG). In addition, certain labour law provisions in different fields of law are also binding on initial and continuing vocational training.

For example, the legal provisions and rules governing work contracts are also applicable to training contracts unless otherwise specified in the BBiG.

Federal Government

The Federal Government is responsible for designing the content of training for the occupations it has recognized unless training is entirely school-based. The nationally binding recognition of the training occupations ensures that the basic principles agreed with industry and the federal states are taken into account and that training for a recognized occupation is only provided in accordance with the training regulations adopted by the Federal Government. The Federal Government's responsibilities are not limited to implementing what was jointly agreed: it also takes measures to promote dual training.

These measures include not only individual support programmes like those stipulated in the Federal Training Assistance Act (BAföG) but also special funding programmes which aim, for example, at creating additional training places in less favoured regions.

The Federal Government provides funding for special research projects to ensure the constant updating of vocational training. The objectives of vocational training research are in particular to establish a basis for vocational training, monitor national and international developments, identify training requirements in terms of goals, content, structures and methods, and test the developed models under practical conditions.

Federal States

The federal states are fully and solely responsible for school education. In dual training this means that – after coordination between the federal states and with the other stakeholders in dual training – each federal state drafts the curricula for instruction at part-time vocational school for the training occupations in question.

Furthermore, the federal states supervise the activities of the chambers.

Industry (Employers and unions)

The proposals submitted by industry for the development or revision of training regulations are taken up by the Federal Government if they have been agreed between employers and unions.

Without the involvement of the Federal Government, the social partners agree on further details of vocational training, particularly the amount of the allowance paid to trainees, within the framework of free collective bargaining. Some collective agreements also include provisions concerning such points as continued employment of training graduates under a limited contract.

Industry (Self-governing bodies (chambers))

As self-governing bodies of industry, the chambers have been assigned public tasks in dual training (competent bodies).

These include counselling and monitoring functions with regard to the individual training contracts. Training advisers of the chambers verify the aptitude of companies and instructors for providing training and advise both companies and trainees. They receive the training contracts and check and register them.

The chambers take care of the overall organization of examinations by fixing dates and setting up examination boards which administer the examinations. Furthermore, the chambers issue the certificates which are awarded to successful candidates.

The examination boards are composed of representatives of employers, employees and vocational schools.

The chamber sets up a vocational training board which must be consulted in important matters of vocational training. It is composed of equal numbers of representatives of companies, unions and – in an advisory capacity – part-time vocational schools (*Federal Ministry of Education and Research, Dual Training at a glance, Berlin 2011*).

2.6. Description of the professions

Motor vehicle mechatronics technicians analyze assemble and disassemble electric, electronic and mechanical systems. They diagnose faults and malfunctions and correct them. They use computer-based information and communications systems to diagnose faults. After repairs or modifications they test functions and the vehicle's compliance with road safety regulations. They go for test drives and measure exhaust emissions. They might equip and upgrade motor vehicles on customer demand and inform them about technological issues. Motor vehicle mechatronics technicians work at motor vehicle workshops, in enterprises that have their own vehicle fleet and in sales departments where they sell vehicles. They specify in the following fields:

- Private motor vehicle technology
- Commercial motor vehicle technology
- Vehicle communication technology
- Systems technology and high-voltage technology
- Motorcycle technology

(<https://www.aubi-plus.com/berufe/kraftfahrzeugmechatroniker-127/>)

There is no specific school-leaving requirement. Usually, companies employ applicants with at least a lower school-leaving certificate.

Contents

Prospective motor vehicle mechatronics technicians are familiarized with the following contents during their training:

- Corporate structures and organization
- Safety, environmental protection, health protection at work
- Planning work procedures, evaluating results
- Quality management
- Measuring, operating and testing vehicle systems
- Operational and technical communication
- Testing, servicing and adjusting motor vehicles and systems
- Assembling, disassembling and repairing
- Diagnosing faults and malfunctions
- Examining vehicles for compliance with road traffic regulations
- Customer counselling

Electronics technician for energy and building technology analyses malfunctions and identifies causes. Electronics technicians do also repair household appliances, such as cooker, oven, refrigerator or washing machine. But they do not only fix things, they also install a building's energy plants and complex electrical control systems. They install sockets, divide up electric circuits, lay cables and install ventilation and air conditioning systems (<https://www.aubi-plus.com/berufe/elektroniker-fachrichtung-energie-und-gebaeudetechnik-38/>).

Contents:

- Electronics technicians for energy and building technology are qualified within three and a half years of training. These are some of the training contents
- Planning and organising electrical installations (in accordance with customer requirements)
- Installing software, devices and networks
- Installing lightning equipment, control equipment, power supply facilities etc.
- Activating energy and building technology equipment
- Operating electrical protective devices
- Analysing malfunctions
- Developing energy supply and building technology systems
- Maintenance and repair

2.7. Objectives, programs, plans and curricula of the professions

Training occupations in the dual system

Training in many recognized occupations qualifies people for work in different fields and thus opens up employment opportunities in various branches. Mechatronics technicians, for example, can work wherever mechatronics systems are produced or maintained (in such fields as machine tool making, rail transport, elevator maintenance, waterworks, and others).

Training in the recognized occupations generally covers a broad range of skills which enable people to carry out different activities within the relevant occupation. However, as the number of occupation-specific activities varies from one occupation to another, differentiation of training in these occupations must vary accordingly. For example, opticians are generalists in their trade and learn all relevant skills. Laboratory technicians, on the other hand, specialize already during training by choosing optional modules. Another kind of differentiation can, for example, be found in the training for wholesale and foreign trade clerks, where trainees must choose one of two branches.

Fig. 4. Training occupations in the dual system



Source: Federal Ministry of Education and Research, Dual Training at a glance, Berlin 2011

Objectives

The aim of all vocational training is to ensure professional action competence. This is defined within this context as the willingness and ability of an individual person to behave

appropriately, thoughtfully and in an individually and socially responsible manner in social, occupational and private situations.

Professional action competences cover the dimensions of expert competence, personal competence and social competence.

- Expert competences refers to the willingness and ability to use specialist knowledge and proficiency as a basis to solve tasks in a target oriented way, appropriately, methodically and independently and to be able to evaluate the results,
- Personal competences refer to the willingness and ability of an individual person to clarify, think through and evaluate the opportunities for development, the demands and the restrictions which arise within the family, at work and in public life, develop his or her talents, make life plans and to develop further. Personal competence embraces such personal characteristics as independence, well-developed critical faculties, reliability and a sense of responsibility and duty. It also includes the development of well-considered systems of values and the adherence to such values which defines the individual,
- Social competence refers to the willingness and ability to experience and organize social relationships, identify and understand affection and tensions and to deal and communicate with others in a rational and responsible manner. It also includes in particular the development of social responsibility and solidarity.

During the 3,5 years of vocational training for Motor vehicle mechatronics technicians and Electronics technicians for energy and building technology all necessary knowledge, skills and competences (= professional action competence) have to be taught to enable the trainees in planning, processing and evaluating professional tasks independently (*Outline Curriculum for vocational education and training in the occupation of Motor vehicle mechatronics technician, Culture and Education Ministers Conference Resolution of 25 April 2013*).

Outline Curriculum and training regulations

The outline curriculum has been coordinated with the corresponding training regulations of the Federal Government. The underlying principle of the outline curriculum, which describes minimum requirements, is to build on the basis of the lower secondary school leaving certificate.

In the case of occupations allocated to a specific occupational field, the outline curriculum is divided into occupational field related basic training and specialist continuation training.

The training regulations and the outline curriculum regulate the aims and content of the vocational education and training and form the basis of final qualification in a regulated occupation, also leading, in conjunction with tuition in further subjects, to qualification from a vocational school. This process fulfils the basic requirements for qualified employment, as well as opening up access to school-based and vocational further and continuing training courses.

The federal states either adopt the outline curriculum directly or implement it in the form of their own schemes of work. If the latter option is followed, care is taken that the coordination of subject and time allocation which has been worked out between the outline curriculum and the respective training regulations is adhered to.

As far as in-company training is concerned, there is a close objective correlation between the outline curriculum and the training regulations. It is recommended that both plans should form the basis for organising exemplary learning situations.

The aims and contents of the outline curriculum relevant to the interim examination or to Part 1 of the final examination are coordinated via cooperation between training venues involving the vocational schools, the company or extra company training partners and the regional examination boards. Learning fields one to six form the basis of this process (*Outline Curriculum for vocational education and training in the occupation of Motor vehicle mechatronics technician, Culture and Education Ministers Conference Resolution of 25 April 2013*).

Overview of the timetables of outline curriculum and training regulations

The outline curriculum is applied in vocational schools. The training regulations include a general training plan for the company based training. Based on this general training plan companies have to create an individual training plan for the trainees.

For vocational schools the curricula of courses for general subjects (e. g. German, social studies, religion / ethics) are basically developed by the federal states. In Thuringia for example the following core school timetable has to be applied in all vocational trainings (such as the motor vehicle mechatronics technicians and the Electronics technician for energy and building technology)

Table 13. The timetables of outline curriculum and training regulations

	Lessons per week in vocational school	Hours per week in the training company
	Part time (2 days)	Part time (3 days)
Specific theory of the apprenticeship trade	8 – 9 (Contents are based on the outline curriculum, see “overview of learning fields”, pages 21 and 23)	24 (Contents are based on the general training plan included in the training regulations)
General subjects:		
German	1	
Religion / Ethics	1	
Social studies	1	
Sports	1	
Elective subjects (e.g. foreign languages)	2 – 1	

Source: <http://landesrecht.thueringen.de/>)

It is possible that courses in vocational school take place in full-time blocks. That means for example the trainees go to vocational school for 5 weeks and interrupt company based training for these weeks. After the full-time block in school the trainees return to the company applying theoretical knowledge to practice.

Motor vehicle mechatronics technicians – Private motor vehicle technology

The outline curriculum and the training regulations of motor vehicle mechatronics technician are built up by a uniform job description and divided into occupational field related basic training and specialist continuation training.

The division of the outline curriculum into the specialist areas of private motor vehicle technology, commercial motor vehicle technology, vehicle communication technology, systems technology and high-voltage technology and motorcycle technology does not begin until the 3rd year of training, as planned in the training regulations.

Occupational profile (*Federal Law Gazette, Training regulations of motor vehicle mechatronics technicians 20.07.2007, Bonn 2008*)

The following skills and knowledge to be imparted making reference to independent planning, execution and monitoring:

1. Vocational education and training, employment and collective bargaining law
2. Structure and organisation of the company providing training
3. Health and safety
4. Environmental protection
5. Planning and preparation of work processes and the monitoring and evaluation of work results
6. Quality management
7. Measuring and testing systems
8. Company and technical communication
9. Communication with internal and external customers
10. Operating vehicles and systems
11. Maintaining, testing and adjusting vehicles, systems and operational equipment
12. Assembling, disassembling and repairing components, subassemblies and systems
13. Operating and commissioning motor vehicles and systems
14. Planning preparation of work processes and the monitoring and evaluation of work results
15. Diagnose of mistakes, technical incidents and their causes and evaluate the results
16. Equip, modify and refit
17. Inspect vehicles in accordance with road traffic regulations
18. Diagnose, maintain, equip, modify and refit

These skills and knowledges are defined in the general training plan included in the training regulations. They have to be taught by the companies within 3 and a half year.

In vocational schools the specific theory is taught as the following time table shows.

Table 14. Overview of learning fields for the regulated occupation of motor vehicle mechatronics technician

Nr.	Learning fields	Suggested time allocation			
		1st year	2nd year	3rd year	4th year
1	Maintenance and care of vehicles or systems	80			
2	Disassemble, repair and assemble simple technical vehicle subassemblies and systems	100			
3	Identify and eliminate dysfunctions	100			
4	Conduct re-fitting work according to customer requests	40			
5	Conduct inspections and additional work		60		
6	Diagnose and eliminate dysfunctions of onboard power systems, charging current systems and starting systems		80		
7	Repair technical vehicle subassemblies and systems due to wear		60		
8	Diagnose mechatronic systems of power-train management systems		80		
9	Conduct service tasks on comfort and safety systems			80	
10	Repair damages on chassis and breaking systems			80	
Private motor vehicle technology specialist area					
11	Diagnose and repair networked power train, comfort and safety systems			80	
12	Prepare vehicle for safety tests and technical acceptance			40	
13	Repair drive components				80
14	Equip, modify and refit systems and components				60
Total (1020 hours)		320	280	280	140

Source: Outline Curriculum for vocational education and training in the occupation of Motor vehicle mechatronics technician, Culture and Education Ministers Conference Resolution of 25 April 2013

Electronics technician for energy and building technology

The outline curriculum and the training regulations of Electronics technician for energy and building technology are built up as well by a uniform job description and divided into occupational field related basic training and specialist continuation training.

The division of the outline curriculum into the specialist areas of energy and building technology, automation and IT and telecommunication starts at the end of the 2nd year of training, as planned in the training regulations.

Occupational profile (*Federal Law Gazette, Training regulations of electronic technicians 25.07.2008, Bonn 2008/*)

The following skills and knowledge to be imparted making reference to independent planning, execution and monitoring:

1. Vocational education and training, employment and collective bargaining law
2. Structure and organisation of the company providing training
3. Health and safety
4. Environmental protection
5. Company and technical communication
6. Planning and preparation of work processes and the monitoring and evaluation of work results, quality management
7. Advising and attending customers regarding products and services
8. Setting up the workplace
9. Assemble and install
10. Install system components and technical networks
11. Measure and analyze
12. Check safety devices
13. Building up and test control systems
14. Conduct service tasks
15. Error analysis and maintain devices and systems
16. Design systems
17. Install and commissioning of technical energy conversion systems and their guides
18. Set up and commissioning of devices
19. Install and set up of building control devices and telecontrol devices
20. Install and check aerials and broadband communication systems

21. Check and maintain building technology systems

These skills and knowledges are defined in the general training plan included in the training regulations. They have to be taught by the companies within 3 and a half year.

In vocational schools the specific theory is taught as the following time table shows:

Table 15. Overview of learning fields for the regulated occupation of electronics technician for energy and building technology

Nr	Learning fields	Suggested time allocation			
		1st year	2nd year	3rd year	4th year
1	Analyse electrical systems and check functions	80			
2	Plan and execute electrical installations	80			
3	Analyse and adjust control systems	80			
4	Make information technology systems available for use	80			
5	Ensure electrical energy supply and the safety of operating equipment		80		
6	Analyse and check equipment and sub-assemblies in plants		60		
7	Programme and realise control systems for plants		80		
Private motor vehicle technology specialist area					
8	Select and integrate drive systems		60		
9	Plan and realise communication systems in residential and functional buildings			100	
10	Operate and repair electrical systems of building services			100	
11	Set up, operate and repair energy systems			80	
12	Plan and realise electrical plants				80
13	Maintain and adjust electrical plants				60
Total (1020 hours)		320	280	280	140

Source: Outline Curriculum for vocational education and training in the occupation of Electronic technicians, Culture and Education Ministers Conference Resolution of 16.05.2003)

2.8. Participation of employers

Practical training by employers

Most apprenticeships are offered in business companies, in the public sector and in independent professions (health, legal, technical/scientific, cultural business). The companies conclude a training contract over the course of 3,5 years in mutual agreement with the trainee. The company assumes the responsibility for teaching the required training contents and support them to develop the professional action competence the trainees need.

If a company wants to train a young trainee there have to be at least one person (chef, employee) who is able to teach the trainee and has the necessary professional and personal competence (trainer). Therefore the trainer had to participate a training course which gives a theoretical and practical instruction in teaching. To become a trainer the person must pass the trainer certification test at one of the chambers.

The company creates an individual training plan corresponding to the training regulations of the Federal Government. Differences caused by operation practice are possible if all training contents can be guaranteed incidentally.

Very often small and medium enterprises have no possibility teaching all training contents. Sometimes caused by a lack of qualified training persons, sometimes due to their specialisation not being able providing all training contents.

Trainees of these company attend external vocational trainings or integrated group training (founded with other companies) where all essential practical training contents are taught. These external vocational trainings are granted by the German government. (BMBF) (*European Centre for the Development of Vocational Training, Vocational Training in Germany – short description, , Luxemburg 2007*).

The participation of final examinations

The final examination comprises Parts 1 and 2, which take place in a staggered fashion at different times. The function of the final examination is to ascertain whether the candidate has acquired occupational competence. In the final examination, candidates are to demonstrate that they have obtained the necessary skills for this purpose, are in possession of the required vocational knowledge and abilities and are familiar with the teaching material to be imparted during teaching at the vocational school.

The chambers take care of the overall organization of examinations. The examination boards are composed of representatives of employers, employees and vocational schools (*Federal Ministry of Education and Research, Dual Training at a glance, Berlin 2011*).

The participation at the development and modernisation of outline curricula and training regulations

Companies are not only involved in practical issues of vocational training but in the development of the outline curricula and training regulations. The first stimulus for the modernization of the curricula due to technological and organisational changes are usually made by the companies.

Thus the companies inform their professional bodies concerning the adaption needs who forward the desire to the Federal Institute for Vocational Education and Training (BIBB) (*European Centre for the Development of Vocational Training, Vocational Training in Germany – short description, , Luxemburg 2007*).

Advantages for employers – Development of human resources

Provision of in-house training contributes to the systematic and long-term personnel development in companies, which as a result remain largely un-affected by fluctuations on the labour market. Recruitment of external skilled labour would be more expensive and more timeconsuming. Training in the company furthermore helps minimize the risk of hiring the wrong person for the job, with all the additional cost this would entail.

Graduates of dual training are familiar with company processes and have worked together with company staff for several years. They are qualified for their specific job and usually show an aboveaverage loyalty to their company. Furthermore they contribute considerably to corporate value creation while training in the company (*Federal Ministry of Education and Research, Dual Training at a glance, Berlin 2011*).

2.9. Summary

The predominant role which the dual system of training plays in Germany is mainly due to the system's many advantages for those involved. Coordinated efforts made by Germany's Federal governments and the Social Partners and the responsibility assumed by companies for training young people are fundamental to Germany's successful dual system model. It is in the shared interest of everyone involved in the system to ensure and improve the value, attractiveness and quality of dual training, now and in future.

Successful graduates of dual training have good chances of finding gainful employment after passing their final examinations. Many trainees are offered an unlimited work contract by their own training company. Some trainees conclude a work contract with another company before taking their final examination or they embark on further training. Some collective agreements stipulate that a limited work contract of at least six months' duration must be concluded with training graduates.

Even training graduates who register for work at the employment agency have good chances of finding a job within a short period of time. Many of them actually find employment in the year in which they have completed their training as can be seen from the diagram. Statistics also show a steadily low employment rate of 3-4% among this group in the following years (*Federal Ministry of Education and Research, Dual Training at a glance, Berlin 2011*).

The companies which provide training contribute the largest share to the financing of dual training. After deduction of the trainees' productive contribution, the companies bear an annual net cost of approximately €5,6 billion. The Federal states spend roughly €2.9 billion each year on the equipment and operation of part-time vocational schools. In addition, federal funds and contributions from the Federal Employment Agency are provided to promote vocational training, for example, via funding of structural programs or individual training support.

Although there are huge advantages of the dual system of vocational training, improvement is necessary due to demographic changes: The decrease in the number of training contracts vs. the rise in the number of vacant training places, an increase in the number of unplaced applicants and the fewer companies offering training are together with the changing educational aspirations and the increasing competitions with institutions of higher education the great challenges of the dual vocational system in the future (*Federal Institute for Vocational Education and Training, VET Data Report Germany 2013 – Facts and analyses*

accompanying the Federal Report on Vocational Education and Training – selected findings, Bonn 2014).

The **Motor vehicle mechatronics technician** is a profession with future. The demand of vocational trainings in motor vehicle mechatronic technicians is still on a high level: At 31.12.2014 about 63.000 young men and women hold a training contract for motor vehicle mechatronic technician. Among these around 20.000 training contracts were signed in 2014 (*Federal Institute for Vocational Education and Training, Data sheet of Motor vehicle mechatronics technician, Bonn 11.01.2016*). According to the Central Association of German Crafts the vocational training in motor vehicle mechatronic technicians was the most popular apprenticeship-of male trainees. The second popular was the vocational training for electronics technicians.

These figures hardly surprise regarding the increasing (flexible) mobility and technological progresses influencing economic and labor market. Qualified motor vehicle mechatronics technicians find employment in various fields: they can work at motor vehicle workshops, for automobile manufacturers and suppliers, in enterprises that have their own vehicle fleet and in sales departments where they sell vehicles. After further education motor vehicle mechatronics can specialize as an instructor (responsible for trainees), motor vehicle service technician, automotive service consultant or a master of motor vehicle mechanic. Also they can study and become a graduate engineer for automotive technology or a graduate engineer for automotive electronics (<https://www.aubi-plus.com/berufe/kraftfahrzeugmechatroniker-127/zukunftschancen/#content>). An employment as a self-employed craftsman is possible as well.

The **electronic technician for energy and building technology** is also a profession with future. The demand of vocational trainings in electronic technician for energy and building technology is not on the same high level as for the motor vehicle technicians: About 34.900 young men and women hold a training contract (31.12.2014). In 2014 around 11.600 new training contracts were signed (*Federal Institute for Vocational Education and Training, Data sheet of Electronic technicians, Bonn 11.01.2016*).

Nevertheless at the labor market the demand of qualified electronic technicians is very high. Caused by the increasing digitalization modern technical skills and competences are needed. And in the future will be a lack of qualified electricians.

After the successful completion of vocational training there are many employment possibilities: The most electronic technicians work in electronic firms or real estate industries.

After passing the further training exam successfully they can work as a certified engineer or as a master of electro technology. Also they can study energy and building technologies. Under certain conditions (e.g. several years of work experiences), electronics technicians can be promoted to higher positions, such as workshop supervisor or project leader. They can work as a self-employed craftsman (<https://www.aubi-plus.com/berufe/elektroniker-fachrichtung-energie-und-gebaeudetechnik-38/zukunftschancen/#content>).

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Chapter 3

The national system of formal vocational training in Portugal on the examples of electrician and car mechanic professions

3.1. The structure of the vocational education and training system

The Portuguese education system does not have a definition for “general education”. However, the international definition is generally accepted: “Education which, in its choice of subject matter, does not envisage any kind of specialisation with a view to preparing students to work in a particular sector”. The Basic Law of the Education System (LBSE) divides the educational system into pre-school education, school education and extra-school education.

According to Decree no. 78/2009 of August 27, basic education is universal, compulsory and free and lasts twelve school years, beginning at the age of six and ending at the age of 18. It comprises four sequential and progressive cycles (1st cycle lasts four years; 2nd cycle, two years; 3rd cycle lasts three years and upper secondary education lasts three years) and its successful completion leads to a diploma certifying completion of basic compulsory education and a level 3 or 4 qualification according to the NQF. Upper secondary education lasts three years, comprises a single cycle and begins at the age of 15. It is structured into differentiated pathways, thus including two branches between which students can switch:

- General education – courses in sciences and humanities, aimed at pursuing studies at higher education level,
- IVET – vocational course apprenticeship courses, education and training courses for young people, specialised art courses, adult education and training courses.

The Portuguese education system offers post-secondary non-tertiary education courses since the creation of the Technological Specialisation Courses [*Cursos de Especialização Tecnológica CET*]. Technological Specialization Courses are defined as post-secondary non-tertiary education courses aimed at the acquisition of a level 4 qualification, as defined in Council Decision no. 85/368/CEE of July 16. This qualification is obtained through the combination of an upper secondary education, whether general or vocational, with a post-secondary technical training. The training offer and access to CET were broadened after a reform in 2006 with the purpose of drawing more students to this type of education. This measure brought a new vitality to the Portuguese post-secondary education, particularly in the case of polytechnic institutes, where the number of enrolled students has grown.

In Portugal, technical education is synonymous with vocational education, just as vocational education is used alongside vocational training. Vocational education or training is used as a generic term covering many different types of education and training, including IVET and CVET. The commonly accepted definition of vocational education or training states that VET

aims to prepare young and adult trainees or workers for performing an occupation. The legislation creating the National Qualifications System states that “vocational education and training” or “vocational training” are training activities that aim to provide individuals with skills for the performance of one or more occupational activities.

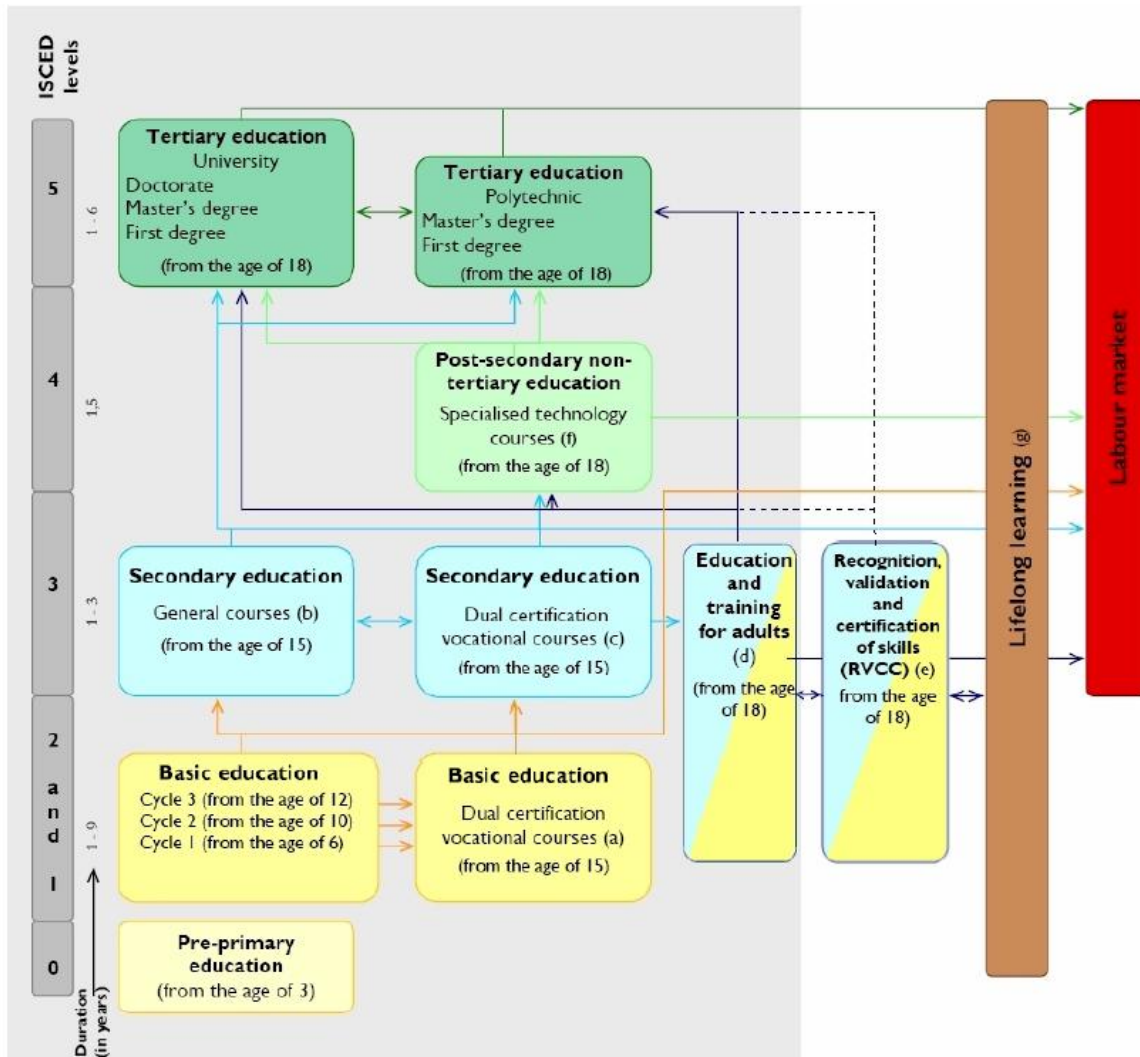
Decree Law no. 396/2007 of December 31, which created the National Qualifications System (SNQ), makes a distinction between

a) initial training [formação inicial], an activity of certified education and training aimed at the acquisition of knowledge, competencies and skills indispensable for the initiation of one or several qualified occupations;

b) double certification initial training [formação inicial de dupla certificação], the initial training included in the National Qualifications Catalogue (CNQ) and developed by an accredited training provider or a recognised educational establishment. Initial training involves different types of training, namely:

- Vocational courses [cursos profissionais]
- Apprenticeship courses [cursos de aprendizagem]
- Education and training courses for young people [cursos de educação e formação para jovens]
- Adult education and training courses

Fig. 5. Structure of the Portuguese vocational education system



Source: DGERT, 2007

- (a) Includes apprenticeships and education and training courses for young people who have not completed basic education.
- (b) Includes courses in the sciences and humanities (science and technology; social and economic sciences; social and human sciences; languages and literature; visual arts).
- (c) Includes vocational courses, apprenticeships, education and training courses for young people, technology courses and specialised art courses.
- (d) Includes education and training courses for adults, leading to dual certification – academic ability and basic level and secondary-level qualifications.
- (e) System that provides adults with recognition, validation and certification of basic-level and secondary-level skills and leads to a qualification.
- (f) Specialised technology courses allow people to pursue their studies, with training being accredited as part of the tertiary education course to which the holder of a diploma in specialised technology is admitted.
- (g) Includes continuing training leading to skills that can be recognised under the RVCC system.

3.2. Basic regulations about vocational training system in Portugal

In Portugal, the legislative framework governing vocational education and training is based on the *Lei de Bases do Sistema Educativo* [Comprehensive Law on the Education System – LBSE] (Law n.º 46/86 of 14 October.) , which established the general framework governing the entire system in 1986.

In 2001, the scope of the legislative framework changed: guidelines were established for setting up and managing basic education curricula (**Decree-Law n.º 6/2001 of 18 January.**), and for assessing learning. Revising the legislation governing basic education reflected one of the Government’s strategic objectives: this level of education is seen as the beginning of lifelong education and training.

In 2004, under the reform of secondary education (**Decree-Law n.º 74/2004 of 26 March, together with respective changes and amendments: Amendment n.º44/2004 of 25 May; Decree-Law n.º 24/2006 of 6 February; Amendment n.º 23/2006 of 7 April; Decree- Law 272/2007 of 26 July.**) , guiding principles were established for the organisation and management of curricula and for the assessment and certification of courses at secondary education level.

The legislative framework governing vocational education and training (**Decree-Law n.º 401/91 of 16 October governs initial vocational training coming under the remit of the Ministry of Education; Decree-Law n.º 405/91 of 16 October governs initial vocational training coming under the remit of the Ministry of Labour and Social Solidarity**), which has been in force since 1991, is now being completely revised. The new regulatory framework to be adopted in 2007, will set up the Sistema Nacional de Qualificações [National Qualifications System – SNQ]. This system brings together under a new institutional framework vocational training which takes within the education system, and vocational training that takes place in the labour market, providing them with shared objectives and instruments.

This system will introduce a new Catálogo Nacional de Qualificações [National Qualifications Catalogue – CNQ] to serve as an instrument for the strategic management of qualifications and to regulate all dual certification training, and a new Quadro Nacional de Qualificações [National Qualifications Framework – NQF], which will define the structure of levels and will be based on the European Qualifications Framework (EQF).

The National Qualifications System will also incorporate the New Opportunities Centres, which will replace the *Centros de Reconhecimento, Validação e Certificação de Competências* [Centres for the Recognition, Validation and Certification of Skills – RVCC] set up in 2001 (**Decree 1082-A/2001 of 5 September**).

With respect to tertiary education, the LBSE has undergone two changes (**Law n.º 115/97, of 19 September and Law n.º 49/2005 of 30 August**): the first clarifies issues concerning access to tertiary education, academic degrees and instruction, while the second adopts the European Credit Transfer System.

3.3. Location of the professions in the national classification of occupation

The location of the professions of an electrician and a car mechanic in the National Framework of Qualifications

Car mechanic - 525083

Field of education and training 525 - Construction and repair of motor vehicles;

National Qualifications Framework - Level 2

Electrician - 522060

Field of education and training 522 - Electricity and energy

National Qualifications Framework - Level 2

National Qualifications Framework (Quadro Nacional De Qualificações - QNQ)

The creation of the National Qualifications Framework (NQF), was held in the framework of the reform of vocational training and the process of creation of the National Qualifications System (Decree n°396 / 2007) and was based on a number of assumptions:

The need for integration and the designation of qualifications across different subsystems of education and training (education, vocational training, higher education), within a single framework;

The importance and taking into account the skills acquired in the contexts of education, non-formal and informal;

Better clarity, transparency and comparability of qualifications;

The value of the double certification mainly associated with secondary qualifications;

Ensuring coordination and coherence with the European Qualifications Framework (QEQ), including the use of QEQ as a reference tool to compare the qualification levels of different qualifications systems in the perspective of learning throughout life.

Descriptions of qualification levels:

The NQF is divided into 8 levels; characterized in terms of three domains defining learning outcomes:

[In accordance with the recommendation of the European Parliament and of the Council of 23 April 2008 on the European System of Qualifications for learning throughout life (JO, n.º C 111 dated May 6, 2008)]

Table 16. Level of Qualifications

Level of qualification	Expected results		
	Knowledge	Skills	Attitudes
Level 2	Basic knowledge in a field of work or study	Cognitive and necessary basic practices the use of appropriate information to accomplish tasks and solve routine problems using simple rules and tools	Work or study under supervision with some degree of independence

Source: CEDEFOP

The structure of NQF

NQF includes primary education, secondary and higher education, vocational training, and procedures for the recognition, validation and certification of skills acquired also through non-formal and informal learning.

3.4. Location of the professions in the classifications EQF

European Qualifications Framework (EQF) are European standards requirements of the common tasks that allow you to adjust the qualification systems in different countries, acting as a translation device to make them more clear and understandable. They have two main objectives: to promote citizens' mobility between countries and facilitate learning throughout life.

Recommendation formally entered into force in April 2008. The year 2010 was set as the date by which countries must adjust their national qualifications systems to the EQF. In 2012, the various national qualification certificates already have a reference to the appropriate EQF level.

EQF lists national qualifications frameworks and systems in different countries on a common European system of references: 8 reference levels. Levels include the full scale of qualifications, from basic level (Level 1, for example, primary school leaving certificate) to advanced (Level 8, for example Doctorates). As an instrument to promote learning throughout life, the EQF encompasses all levels of qualifications acquired through general education, vocational and academic. In addition, the framework includes qualification in vocational education and training. Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes and acquire appropriate qualifications at this level.

The occupations of an electrician and a car mechanic are qualified to level 2 of the European Qualifications Framework

3.5. The organisations involved in vocational training

Administrative framework

The education and training system in Portugal is centrally administered vis-à-vis the definition of major policy lines and curricular, teaching and financial guidelines.

The Ministry of Labour and Social Solidarity (MTSS) is responsible for defining, managing and implementing policies on employment, vocational training, industrial relations, working conditions and social security. It performs its tasks via central, regional and local services and advisory bodies.

The Institute for Employment and Vocational Training (IEFP) is the national public employment service responsible for implementing active employment policies, particularly those pertaining to vocational training. It performs its tasks via five regional delegations and various local executive bodies:

31 Centros de Formação Profissional de Gestão Directa [Direct-Management Vocational Training Centres],

86 Centros de Emprego [Employment Centres] and 1 Centro de Reabilitação Profissional de Gestão Directa [Direct-Management Vocational Rehabilitation Centre].

The IEFP participates in 26 Centros de Formação Profissional de Gestão Participada [Joint-Management Vocational Training Centres] and 2 Centros de Reabilitação Profissional de Gestão Participada [Joint-Management Vocational Rehabilitation Centres] which have been set up under agreements with employers' associations or trade-union organisations in order to promote vocational training activities at sectoral level (see Glossary).

The Ministry of Education (ME) is responsible for defining, coordinating, implementing and assessing national policy related to the education system, specifically pre-primary education, basic education, secondary education and adult education; and, with regard to national policies to promote qualification levels, for coordinating and integrating national education policy and national vocational training policy. The Ministry of Education's tasks are performed by central, regional and local services, with the support of advisory bodies whose members include the social partners.

At central government level, the Directorate-General for Innovation and Curricular Development (DGIDC) helps to define policies on teaching methods and components and ensures implementation of those policies by defining study plans, objectives and essential curriculum content.

Under the Organic Law governing the Ministry of Education **Decree-Law n.º 213/2006 of 27 October.**, the Directorate-General for Vocational Training was restructured, leading to the creation of the National Qualifications Agency (ANQ), a body that is answerable to both the Ministry of Labour and Social Solidarity and the Ministry of Education. Its mandate is to coordinate the implementation of policies on education and vocational training for young people and adults and to set up and manage the system for the recognition, validation and certification of skills.

At regional level, the five Direcções Regionais de Educação [Regional Directorates for Education – DRE] are responsible for coordinating and supporting the organisation and running of schools and the management of associated human and material resources; participating in planning the school network; and cooperating with other services and bodies in joint activities concerning vocational education and training.

Legislative framework

In Portugal, the legislative framework governing vocational education and training is based on the Lei de Bases do Sistema Educativo [Comprehensive Law on the Education System – LBSE] (Law n.º 46/86 of 14 October.) , which established the general framework governing the entire system in 1986.

In 2001, the scope of the legislative framework changed: guidelines were established for setting up and managing basic education curricula (**Decree-Law n.º 6/2001 of 18 January**), and for assessing learning. Revising the legislation governing basic education reflected one of the Government's strategic objectives: this level of education is seen as the beginning of lifelong education and training.

In 2004, under the reform of secondary education (**Decree-Law n.º 74/2004 of 26 March, together with respective changes and amendments: Amendment n.º44/2004 of 25 May; Decree-Law n.º 24/2006 of 6 February; Amendment n.º 23/2006 of 7 April; Decree- Law 272/2007 of 26 July.**) , guiding principles were established for the organisation and management of curricula and for the assessment and certification of courses at secondary education level.

The legislative framework governing vocational education and training (**Decree-Law n.º 401/91 of 16 October governs initial vocational training coming under the remit of the Ministry of Education; Decree-Law n.º 405/91 of 16 October governs initial vocational training coming under the remit of the Ministry of Labour and Social Solidarity.**), which

has been in force since 1991, is now being completely revised. The new regulatory framework to be adopted in 2007, will set up the Sistema Nacional de Qualificações [National Qualifications System – SNQ]. This system brings together under a new institutional framework vocational training which takes place within the education system, and vocational training that takes place in the labour market, providing them with shared objectives and instruments.

This system will introduce a new Catálogo Nacional de Qualificações [National Qualifications Catalogue – CNQ] to serve as an instrument for the strategic management of qualifications and to regulate all dual certification training, and a new Quadro Nacional de Qualificações [National Qualifications Framework – NQF], which will define the structure of levels and will be based on the European Qualifications Framework (EQF).

The National Qualifications System will also incorporate the New Opportunities Centres, which will replace the Centros de Reconhecimento, Validação e Certificação de Competências [Centres for the Recognition, Validation and Certification of Skills – RVCC] set up in 2001 (**Decree 1082-A/2001 of 5 September**).

With respect to tertiary education, the LBSE has undergone two changes (**Law n.º 115/97, of 19 September and Law n.º 49/2005 of 30 August**): the first clarifies issues concerning access to tertiary education, academic degrees and instruction, while the second adopts the European Credit Transfer System.

3.6. Description of the electrician and car mechanic profession

Obtained qualifications and learning outcomes confirmed by the qualification exam learning outcomes

Professional competence for the profession of electrician

KNOWLEDGE OF:

1. Mathematics.
2. Technical Drawing.
3. Welding.
4. English language (the use of specific technical vocabulary).
5. Systems of telecommunications.
6. Mechanics.
7. Electrical energy.
8. Electronics.
9. Home automation .
10. Safety, hygiene, health and environmental protection, applied to professional activities.
11. Rules and their application to professional activities.
12. Typology and characteristics of the materials relating to the execution and maintenance of electrical installations.
13. Typology and characteristics of the materials relating to the execution and maintenance of lighting and electrical equipment.
14. Typology and characteristics of the materials relating to the execution and maintenance of electrical driving force.
15. Typology and characteristics of the materials relating to the installation of infrastructure related to television antennas.
16. Typology and characterization tools used for construction and maintenance of electrical installations.
17. Types and operation of electrical installations.
18. Types and operation of electrical lighting systems.
19. Types and operation of electrical traction equipment.
20. Installation and testing of electrical installations.
21. Techniques for the installation and testing of electrical installations and electric lighting.

22. Technical installation and controlling the electrical driving force.
23. Preventive and corrective technical work, maintenance of electrical installations.
24. Techniques of preventive and corrective maintenance of lighting and electrical equipment.
25. Techniques of preventive repair and maintenance of electric driving force.

KNOWS/CAN:

1. Interpret technical specifications for electrical installations and their maintenance.
2. Techniques and ways to prepare the appropriate equipment, tools, components and materials suitable for the electrical installation and maintenance.
3. Identify and know the characteristics of various types of equipment, tools, components, and materials used to make electrical installations, lighting or TV antennas.
4. Use the tools and materials necessary for the electrical installation
5. Determine the distribution and distribution systems and electrical equipment.
6. Use the methods and techniques for implementing the determination of points and the baseline electrical installation.
7. Know the procedures for verification of various installation modes.
8. Use procedures and techniques of installation and connection of the circuit and knows the equipment suitable for the installation of electrical risers and entrances, electrical lighting and power; knows the installation of automatic controls, installation of electrical equipment and installations of TV antenna.
9. Use appropriate procedures, methods and techniques to verify and test the installation of electrical systems, electric power transmission, antenna systems, television, lighting and power.
10. Identify the malfunction of electrical wiring, lighting and electric appliances and TV antenna systems.
11. Apply techniques and procedures for replacement and repair of components of the circuit and wiring devices, electrical installations, lighting and power equipment, electrical installations and equipment of television antennas.
12. Apply the principles of safety, hygiene, health and environmental protection in relation to the activity.
13. Apply the principles of electrical installations, in accordance with applicable regulations.

BEHAVIOR:

1. Interacts with other team members in the performance of certain tasks together.
2. Maintains standards of safety, hygiene, health and environmental protection in the course of professional activities.
3. Observes the rules and regulations for electrical installations in the exercise of their professional activities.
4. Is able to adapt to new situations and technologies.

Professional competences for the profession of a car mechanic**KNOWLEDGE**

1. English or another foreign language appropriate to the performed tasks
2. Technical drawing (Interpretation of assembly drawings of mechanical parts and electric components).
3. Mathematics (arithmetic, percentages, proportions and simple equations).
4. Electric energy (batteries, alternators and electrical circuits).
5. Physics and Chemistry (materials, combustion and mechanics).
6. Electronics (system control technology of passenger cars)
7. Norms and quality standards.
8. Protection of the environment.
9. Informatics
10. Communication and interpersonal relationships
11. Structure, operation and regulation of gasoline and diesel engines in passenger cars.
12. Construction, operation and regulation of the steering system, suspension, brakes and active safety systems.
13. Construction, operation and regulation of transmission systems.
14. Construction, operation and regulation of ignition systems of cars.
15. Construction, operation and regulation of electric power systems, turbocharger and antifouling systems.
16. Construction, operation and regulation systems of cooling and lubrication of cars.
17. Operating systems and control of passenger and freight car.

KNOWLEDGE:

1. Safety, hygiene and health at work.
2. Technical standards (manufacturer's instructions).
3. Metrology (number, measurement procedures, standards and tolerances).
4. Mechanical technology.
5. Technology of materials.
6. Technology of equipment used in the diagnosis of faults in cars.
7. Types of equipment and tools used to repair cars.
8. The process of repair and testing of car engines.
9. The process of repair and testing of steering, suspension, brakes and active safety systems.
10. Diagnostic procedures, anomalies of wheels and tires.
11. The process of repair and testing of transmission systems of passenger cars.
12. The process of repair of propulsion and ignition systems.
13. The process of repair of energy systems.
14. The process of repair cooling and lubrication light vehicles.
15. The process of diagnosis and components of the load system and engine starter.
16. The process of fault diagnosis and replacement of mechanical air conditioning systems of cars.

KNOWS AND CAN:

1. Interpret technical drawings, patterns and reuse instruction and other technical documentation of various mechanical systems.
2. Apply the rules and procedures relating to the safety, health and the environmental protection associated with the professional activity.
3. Identify defects and use diagnostic equipment.
4. Identify and use a variety of tools and equipment used in various systems of repairing the passenger cars.
5. Identify and recognize the features of the petrol and diesel in passenger cars.
6. Using the appropriate methods and techniques to detect abnormalities in gasoline.
7. Use techniques for repairing motor gasoline and diesel passenger cars.
8. Using the appropriate test techniques can diagnose problems in gasoline engine and diesel cars.

9. Identify and recognize the features of the steering, suspension, brakes and active safety systems.
10. Apply the methods and techniques suitable for detecting anomalies in the steering, suspension, brakes and active safety systems.
11. Use a repair technique of steering, suspension, braking and active safety systems.
12. Use research techniques of steering, suspension, brakes and active safety systems.
13. Apply the methods and techniques suitable for detecting defects in wheels and tires of passenger cars.
14. Use techniques of wheel parts and tires for cars.
15. Identify and recognize the features of the transmission systems of passenger cars.
16. Apply the methods and techniques suitable for the detection of anomalies in transmission systems of passenger cars.
17. Use a repair technique of light transmission systems.
18. Use techniques for testing transmission systems of passenger cars.
19. Identify and recognize the features of operating automotive ignition systems in light cars.
20. Apply the methods and techniques suitable for the detection of anomalies in ignition systems of the engine.
21. Use repair techniques of ignition drive systems.
22. Use technology research of power systems, turbocharger systems and limiting emissions.
23. Identify and recognize the features of the energy systems, turbocharger systems and limiting emissions.
24. Use technology research of power systems, turbocharger systems and emission reduction.
25. Identify and recognize the features of operating systems, cooling and lubricating light vehicles.
26. Apply the methods and techniques suitable for detecting irregularities in the cooling system and lubrication of vehicles.
27. Use repair technique of cooling systems and engine lubrication.
28. Use of repair techniques of mechanical system of the light and air conditioning systems.
29. Use techniques to test cooling systems.
30. Identify and recognize the characteristics of systems work load and light motor starting.
31. Apply the methods and techniques suitable for detecting fault in starter and load systems.
32. Use technology exchange components system of load and engine starter.
33. Use the techniques and products necessary for the maintenance of the parts and conditions of cleaning systems.

34. Using the procedures and products necessary to maintain the cleanliness of the workplace, tools and used equipment.
35. Knows the technical documentation regarding to the business registration.

BEHAVIOR:

1. Interaction with other employees in the process of diagnosing faults and repair light vehicles.
2. The organization of the workplace, enabling the proper performance of the work.
3. Observe the rules and procedures of safety, hygiene, health and environmental protection in the course of professional activities.
4. Take responsibility for action in the performance of their tasks.
5. Assertive behavior in relationships with others.
6. Co-operation in achieving the objectives.
7. Take the initiative to find a suitable solution.
8. Adjusts to new technologies.

3.7. Objectives, programs, plans and curricula of the electrician and car mechanic profession

The Ministério da Educação [Ministry of Education – ME] is responsible for national policy concerning the education system at the levels of pre-primary, basic and secondary education. It guarantees the conditions for the smooth running of all processes involved in teaching, learning and the development of curricula and programmes, and promotes scientific research and technical studies on curriculum development in non-tertiary education via the Direcção Geral de Inovação e de Desenvolvimento Curricular [Directorate-General for Innovation and Curricular Development], which is responsible for defining study plans and essential curriculum content and objectives and for monitoring and assessing their implementation. The ANQ, which is answerable to the MTSS and the ME, is also responsible for promoting research and innovation as regards curricula, teaching methods and resources and for encouraging the dissemination of knowledge by promoting and participating in networks and partnerships in information, experimentation and the transfer of knowledge. The CNQ, drawn up by the ANQ, includes the basic standards for the construction and implementation of training programmes and provides curriculum guidelines for this purpose. It is, however, flexible enough to allow training bodies to run the training programmes they deem most appropriate and effective for the target groups (enterprises and individuals) and geographical areas they cover. In the field of public tertiary education, the universities and polytechnic establishments have the authority to design courses, define the respective curricula and update them as appropriate, provided that for registration purposes they inform the Ministério da Ciência, Tecnologia e Ensino Superior [Ministry of Science, Technology and Higher Education – MCTES]. The creation of new tertiary education courses by private institutions is subject to assessment by a committee of experts, and subsequent authorisation.

3.8. Participation of employers

In Portugal, the cost of the vocational education and training system is covered almost entirely by public funding in the form of contributions from the orçamento de Estado [State budget – OE], the orçamento da Segurança Social [Social Security budget – OSS] and the European Social Fund (ESF). Contributions from the OE finance vocational education and training activities within the education system that are run by the ME and under sectoral programmes run by government departments of the Ministries for the Economy, Health and Agriculture. Vocational training provided under the MTSS is financed by funds allocated to the Instituto do Emprego e Formação Profissional [Institute for Employment and Vocational Training – IEFP] from the OSS [comprising contributions paid by enterprises (23.75 % of the value of gross salaries paid) and by workers (11 % of gross salary received)]. To cover active employment and vocational training policies, the OSS systematically sets aside 4.7 % (32) of workers' and employers' social security contributions, which is topped up by an allocation of VAT receipts from the State budget. Portugal receives substantial support from the European Union to help fund vocational education and training policies, in the form of ESF resources. These are earmarked for specific measures under the Operational Programmes that are included within Community Support Frameworks (CSF). During the 2000-2006 programming period for CSF III, ESF resources were particularly concentrated on the Programa Operacional Educação [Operational Programme for Education] and the Programa Operacional Emprego, Formação e Desenvolvimento Social [Operational Programme for Employment, Training and Social Development], with substantial support from this structural fund also being allocated to the Programas Operacionais da Economia, Saúde e Agricultura [Operational Programmes for the Economy, Health and Agriculture] and the Programas Operacionais de Âmbito Regional [Regional Operational Programmes]. The Instituto de Gestão do Fundo Social Europeu [Institute for Management of the European Social Fund – IGFSE] is the MTSS department responsible at national level for managing, coordinating and supervising activities supported by the ESF. For training schemes supported under Operational Programmes within the Community Support Framework (CSF), funding from the OSS is of particular significance, since the latter (32) Law no. 52 C/96 of 27 December. 46 is the source of public finance that guarantees the national contribution to vocational training schemes run by private bodies. The State is the main provider of funding for initial vocational training (see Glossary) for unemployed people, with the financial support made available by the ESF being of particular importance. Financing continuing vocational training for

employed people is considered to be the responsibility of employers, though the State may provide financial support and incentives.

Under the Lei de Bases do Sistema Educativo [Comprehensive Law on the Education System – LBSE], basic education is free. All costs associated with registration, attendance and certification are covered, and some pupils may be eligible for free use of school books and materials as well as for free food and accommodation, depending on the socioeconomic situation of their family. School transport is free for pupils attending basic education. The initial vocational education and training offered within the education system is essentially funded from the ME's budget, though the ESF's contribution to the funding of certain measures is also significant. Funding for technology courses comes from the ME's budget. Vocational courses are offered by the network of vocational schools – a system that has received strong support from the ESF within the framework of measures included in Operational Programmes. For the period 2000-2005, ESF financing totalled 195 million euro, corresponding to 57.5 % of total public expenditure of 339 million euro. Most of the initial vocational education and training programmes offered by the MTSS are funded entirely from public funds, in the form of the allocation of resources from the OSS and ESF. The apprenticeship system has also been supported by significant funding from the ESF. During the period 2000-2005, under the Programa Operacional Emprego, Formação e Desenvolvimento Social [Operational Programme for Employment, Training and Social Development], ESF funding for alternance training amounted to 286 million euro, corresponding to 62.5 % of total public expenditure of 457 million euro. National public financing is provided through the IEFPP – that is, from OSS resources.

The social partners' involvement in the development and provision of continuing vocational training gained increased support with the signing of the Acordo sobre Política de Emprego, Mercado de Trabalho, Educação e Formação [Agreement on Employment, Labour Market, and Education and Training Policy] (2001) and with implementation of the Código do Trabalho [Labour Code] (2003) (23). The Labour Code enshrines in law the employers' obligation to ensure that, every year, at least 10 % of workers on permanent contracts take part in training courses, and to assert the right of every worker to receive a minimum of 35 hours certified training each year. Enterprises involved in modernisation schemes or projects to improve workers' qualifications receive financial support, in accordance with the Quadro de Referência Estratégico Nacional 2007-2013 [National Strategic Reference Framework –

QREN]. Continuing vocational training is offered at sectoral level by organisations belonging to the private sector, employers, cooperatives and associations. Finance and manufacturing are the sectors with the highest number of participants in training schemes. Enterprises in the more dynamic and competitive sectors also tend to invest in the development of the vocational skills of their collaborators in areas of knowledge related to or associated with their strategy and purpose. Cooperation agreements are frequently signed between large or medium-sized enterprises and universities or polytechnics for the provision of advanced training programmes (usually in the areas of management, finance, marketing and technology) which, while respecting the requirements of the tertiary education establishment involved, are also in line with the enterprise's needs and priorities. The number of workers involved in vocational training schemes varies widely from sector to sector and depending on the size of enterprise concerned. The results of the Inquérito Comunitário à Formação Contínua nas Empresas [Community Survey of Continuing Training in Enterprises] (24) and the Inquéritos Nacionais sobre a Execução das Acções de Formação Profissional [National Surveys of the Implementation of Vocational Training Activities] (25) indicate an upward trend in participation by workers in enterprises with ten or more employees. The 1994 figures showed participation by some 7.7 % of workers in (23) Approved by Law n.º 99/2003 of 27 July, and regulated by Law n.º 35/2004 of 29 July. (24) Conducted by the MTSS in 1999.

Available at <http://www.gep.mtss.gov.pt/estatistica/formacao/fpcontinua1999.pdf> (25) Conducted by the MTSS from 1992 to 2004. Available at <http://www.gep.mtss.gov.pt/estatistica/formacao/index.php> 32 enterprises of this size; the percentage had risen to 22 % in 2004. The results also indicate that workers' access to vocational training increases with the size of the enterprise concerned. To offer employees easier access to vocational training, the New Opportunities Initiative (see Section 8.3) aims to expand training opportunities by modularising and adapting courses and by employing organisational and cost-sharing mechanisms that, on the one hand, ensure that employees exercise their individual right to training and, on the other, are compatible with the current and future competitiveness of the company.

3.9. Summary

The education and training system in Portugal is centrally administered with reference to the definition of major policy lines and curricular, teaching and financial guidelines. The Autonomous Regions of the Azores and Madeira have some independence in this area but are subject to the key national guidelines .

The major actors in the administration of the education and training system include three Ministers: Ministry of Labour and Social Solidarity , Ministry of Education and Ministry of Science, Technology and Higher Education . Their intervention is made predominantly by three Directorates: Directorate-General for Employment and Industrial Relations, Directorate-General for Innovation and Curricular Development and Directorate-General for Higher Education . Additionally, the National Qualifications Agency and Institute for Employment and Vocational Training performs an important role in Portuguese VET system .

The Portuguese vocational education and training system comprises pre-primary, basic, secondary, post-secondary non-tertiary, and tertiary education.

Basic education is universal, compulsory and free, and lasts for nine academic years, beginning at the age of six and ending at the age of 15, in accordance with the Comprehensive Law on the education system . It comprises three sequential and progressive cycles and its successful completion leads to a diploma certifying completion of basic compulsory education.

Secondary education lasts for three years, comprises a single cycle and begins at the age of 15. It can be completed either by studying general courses in the sciences and humanities with a view to pursuing studies at a higher level, or by following a vocational pathway – vocational courses, apprenticeships, education and training courses, specialised art courses, technology courses, adult-education courses; these qualify students to enter the labour market but also allow them to continue their studies.

Post-secondary non-tertiary education comprises specialised technology courses, which prepare and qualify students for work and successful completion of which leads to a diploma in specialised technology. These courses are divided into credit units which can be transferred to tertiary education courses to which they give access. As a result of Portugal's adhesion to the Bologna Process, tertiary education is undergoing profound restructuring, as regards both curriculum content and the assessment system and awarding of degrees. The usual age of entry into this level of education is 18.

Is relevant to emphasize in this context the Vocational Training Reform Agreement (in 2007), signed by the government and major Social Partners and that creates the necessary background to the strategy of qualification in terms of the implementation of the double certification principal for young people and working age employed adults (through attending modular education and training courses that are accredited for the purposes of academic and/or vocational certification); establishment of the National System of Qualification (creating CNQ); enhance the reformation of the System for the Accreditation of Training Bodies; strengthen the improvement in the qualifications of trainers and the involvement of the Social Partners in the supervision and encouragement of vocational training for employees .

Since 1985, the Portuguese system has been structured on the basis of five training levels (International Standard Classification of Education). These levels have achieved public visibility and are recognised and accepted by most actors in vocational education and training systems, as well as by the social partners and enterprises. The new National Qualifications Framework will define the new national qualification levels, in accordance with the European Qualifications Framework (EQF).

In general, the VET providers include public, technological and professional schools; universities and other tertiary institutions; training centers of direct management and training professional centers of participated management (both related to the Institute for Employment and Vocational Training); non public operators).

Additionally, the Comprehensive Law on the education system institutionalizes the social partners' participation in vocational education and training. The partners are involved in the general definition of policies and in their pursuance within advisory and social coordination bodies: Economic and Social Council, the National Vocational Training Council and the National Education Council .

3.10 References

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