Quality by Units

TNOiK Towarzystwo Naukowe Organizacji i Kierownictwa

Country Report

Poland

Content

1. Introduction: A short description of the sector of mechatronics – areas of employment in Poland where the occupation is practiced 1

2. The learning outcomes approach 9

3. Examination procedures 14

4. Conclusion 19

Lifelong Learning Programme

This project has been funded with support from the European Commission.
This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1. Introduction: A short description of the sector of mechatronics – areas of employment in Poland where the occupation is practiced

Jobs in the professions directly or indirectly related to mechatronic engineering can be found in a majority of sectors of the national economy: the industry, transport and scientific research in the first place. The most prominent of the sectors is industry, in which the following lines of business, where professional mechatronic technicians (engineers, technicians, assemblers and operators) are employed, can be named:

- electromechanical engineering (machine-building industry, metal processing industry, precise engineering, production of means of transport, electrical and electronic industry);
- high-tech industries;
- power industry;
- food industry,
- light industry,
- printing industry.

Besides typical manufacturing industries, a significant and ever broadening area of mechatronic engineers employment is the sector of services (the assembling and repair of machinery and equipment in particular). As regards transport, it is mostly the jobs related to the use and maintenance of means of land/air/maritime transport that are concerned. In the fifth sector of the economy an ever broader area where mechatronic engineers are employed is, besides scientific research, the military and police, where the specialists are required to operate the modern specialist equipment.

Which mechatronic jobs are covered by the Polish (formal and non-formal) system of education and professional improvement

The Polish system of vocational education and improvement includes a wide number of jobs directly and indirectly related to the area of mechatronic technologies. As per the current classification of jobs and specialties[1], jobs related to the sector of mechatronics can be found in the following groups: specialists, technicians and other medium-level staff, machinery and equipment operators and assemblers. A complete and unmistakable identification of jobs related to the sector of mechatronics is rather complicated owing to the differences existing between the classification of occupations and specialties (Polish abbr. KZiS) developed for the needs of the labour market and the classification of occupations under the

[1] Ordinance of the Minister of Labour and Social Policy of 27 April, 2010 on Classification of Occupations and Specialties for the Needs of the Labour Market and the Range of Its use (Journal of Laws No. 82 of 17 May, 2010, item 537).

system of vocational education and improvement (Polish abr. KZSZ)[2]. Table 9 includes the jobs identified under the system of vocational education and improvement, which – considering the qualifications required – are related to the sector of mechatronics:

Job code as per KZSZ 2007	Job code as per KZiS 2010	Job name	Level of qualifica-tions as per ISCO-08	Level of qualifica-tions as per PRK (Polish Qualification Framework)
	214404	Mechanical engineer –industrial machinery and equipment	Level 4	Levels 6-7
	214405	Mechanical engineer – precise engineering		
	214408 214903	Air mechanical engineer Automation and robotics engineer		
	214904	Avionic engineer		
	214905	Biocybernetics and biomedical engineer		
	215103	Electrical engineer		
	215104	Electrical/automation engineer		
	215201	Electronic engineer		
	215202	Mechatronic engineer		
311[07]	311408	Electronic technician	Level 3	Level 4
311[08]	311303	Electrical technician		
311[20]	311504	Mechanical technician		
311[50]	311410	Mechatronic technician		
311[52]	311513	Automotive vehicle technician		
314[05]	315317	Air mechanical technician		
314[06]	315316	Avionic technician		

[2] Ordinance of the Minister of National Education of 23 December, 2011 on Vocational Education System Classification of Occupations (Journal of Laws of 3 January, 2012, item 7).

Job code as per KZSZ 2007	Job code as per KZiS 2010	Job name	Level of qualifica-tions as per ISCO-08	Level of qualifica-tions as per PRK (Polish Qualification Framework)
723[02]	723310	Machinery and equipment mechanician/assembler		Level 3
723[04]	723103	Automotive vehicle mechanician		
724[01]	741103	Electrician		
724[02]	741203	Automotive vehicle electromechanician		
724[05]	741201	Electromechanician		
725[01]	742102	Electronic assembler		
725[03]	742114	Mechatronic assembler	Level 2	
731[01]	731102	Industrial automation and precise engineering mechanician		

Table 1: Jobs under the system of vocational education and improvement (KSZS), related to the sector of mechatronics

What qualifications are required for doing the jobs

The level and scope of detailed qualification requirements for the jobs indicated in table 10 is adjusted to the specific area of engineering and particular features of the job. The selected main qualification requirements for the jobs have been developed using the current core curricula. In case of engineers, no standards of vocational qualifications have been developed. For some of the jobs from the area no job descriptions are available either. The table does not include the requirements concerning technical education and the targeted knowledge for the job (as the general requirement and key precondition for the attainment of the indicated vocational skills).

Job	Description of basic vocational qualifications
Level 4 ISCO-08 (6-7 level PRK) – specialists	
Engineers (as per the list in Table 9)	Indicated based on the analysis of training curricula at domestic technical higher education institutes dealing with mechatronic engineering ▪formulating and solving mechatronic design tasks; ▪designing and structuring mechatronic devices and systems; ▪programming and use of mechatronic devices and systems; ▪assembling and dismantling mechatronic devices and systems; ▪diagnosis of technical condition of mechatronic devices and systems; ▪programming and managing processes of mechatronic device and system repair
Level 3 ISCO-08 (4 level PRK – technicians)	
Electronic technician	▪installation and maintenance of electronic devices ▪use of electronic devices ▪repair of electronic devices
Electric technician	▪assembling electric machinery and devices and putting them into operation ▪laying down electric wiring and putting it into operation ▪assessment of technical condition, identification and repair of electric machinery/devices/installations damages
Mechanical technician	▪development of parts of machinery and devices ▪assembling of machinery and devices ▪- installation of machinery and devices and putting them into operation
Mechatronic technician	▪designing and construction of mechatronic devices and systems ▪assembling and dismantling mechatronic devices and systems ▪programming and use of mechatronic devices and

	systems ▪ diagnosis and repair of mechatronic devices and systems

Job	Description of basic vocational qualifications
Automotive vehicle technician	▪diagnosis of technical condition of automotive vehicles ▪service and maintenance of automotive vehicles ▪service of automotive vehicles arrangement and supervision thereof
Air mechanical technician Avionic technician	▪providing technical assessment of aircraft ▪service of aircraft ▪repair of units and equipment of aircraft
Level 2 ISCO-08 (3 level PRK) – assemblers and mechanicians	
Machinery and equipment mechanician/assembler	▪assembling, installation of machinery and devices and putting them into operation ▪operation and maintenance of machinery and devices
Automotive vehicle mechanician	▪diagnostics of automotive vehicles ▪repairing automotive vehicles
Electrician	▪assembling electric machinery and devices and putting them into operation ▪laying down electric wiring and putting it into operation ▪assessment of technical condition of electric machinery/devices/installations after assembling, based on measurements
Automotive vehicle electromechanician	▪assessment of technical condition and repairs of electric/electronic systems of automotive vehicles
Electromechanician	▪assembling of electric machinery and devices using technical documentation and putting them into operation ▪assessment of technical condition of electric machinery/devices/installations after assembling, based on measurements ▪assembling control/regulatory/protection systems of electric machinery and devices, using technical documentation
Electronic assembler	▪assembling electronic elements/sub-assemblies/systems ▪installation and maintenance of electronic devices

Job	Description of basic vocational qualifications
Mechatronic assembler	▪assembling and dismantling mechanical elements/sub-assemblies/systems in mechatronic devices and systems ▪putting mechatronic devices into operation and providing the required adjustments ▪repair and maintenance of mechatronic devices and systems
Industrial automation and precise engineering mechanician	▪assembling of industrial automation and precise engineering systems, putting into operation and servicing them

Table 2: Statement of essential qualification requirements for the jobs related to the sector of mechatronics

Under the now pursued policy of vocational education an obvious assumption is that the vocational qualifications, as set by the core curricula to be achieved by the students, reflect systematically monitored expectations of the employers. There remains, however, certain inertia as regards the updating of the training curricula; the latter should be better adapted to the results of the research done on the development of the economy and labour market needs. A precondition for the creation of an efficient system of vocational education and training should lie in systematically taken measures aimed at flexible reactions to the changes in business life and a significant shortening of the time for the adjustment of training curricula to the current needs.

Given modern trends of the development of Poland's economy and demands of the country's business people the following primordial qualification requirements can be named for mechatronics-related jobs.

Level 4 of ISCO-08 – specialists (level 6-7 of PRK)

- computer literacy and use of tool software;
- knowledge of English, technological vocabulary in particular;
- comprehensive knowledge in the field of mechatronics and the ability to quickly broaden it in a specific area as required by the company;
- use of, development and dissemination of technological information;
- managing the work of subordinated specialists and technicians;
- keeping the documentation related to the work done;
- designing mechatronic devices and systems, the customer's requirements being taken into account;
- making use of the latest technological and organizational developments;
- assembling mechatronic devices and systems and putting them into operation;
- diagnosis of technical condition and repair of mechatronic devices and systems;
- organization and management of a quality maintenance system;
- managing the processes of machinery and device utilization.

Level 3 of ISCO-08 – technicians (level 4 of PRK)

- computer literacy and knowledge of basic English technological vocabulary;
- identification and analysis of the structure and rules of operation of machinery and devices using technological documentation;
- assembling machinery and devices and putting them into operation;
- supervision of the operation of machinery and devices;
- diagnosis of technical condition and repair of machinery and devices;
- use of, development and dissemination of technological information;
- designing devices (at the basic level), the customer's requirements being taken into account.

Level of 2 ISCO-08 – assemblers and mechanicians (level 3 of PRK)

- identification and analysis of the structure and rules of operation of machinery and devices using technological documentation;
- assembling machinery and devices and putting them into operation;
- supervision of the operation of machinery and devices;
- diagnosis of technical condition and repair of machinery and devices;

- use of technological information.

It should be stressed that under the conditions of quickly developing technologies and the dynamic changes of market environment, the approach dominating in the companies assumes:

- high specialization (flexibility and adaptation), quickly attained at various jobs where mostly technicians are employed;
- the ability to quickly broaden general knowledge in the mechatronic sphere of company operation and reach specialization in the desired direction.

The above mentioned skills are important for efficient operation of the company, as they contribute to the attainment of the required flexibility of the staff.

2. The learning outcomes approach

The influence of EQF on vocational educational and training systems in Poland, in particular their connection with the labour market in the field of mechatronics (the way in which EQF is implemented in Poland in formal and non-formal education – rules, legal regulations, contemplated time framework for implementation)

For the purposes of training, in accordance with the classification of occupations as used under the system of vocational education, areas of education were indicated, with occupations assigned to them. Within the areas of education occupations are grouped taking into account common or similar qualifications needed to perform the tasks within a single occupation. Taking into account the Polish Classification of Activities (equal to NACE Classification), 8 areas of education have been singled out:

- administration and service (A)
- construction (B)
- electrics/electronic (E)
- mechanics and mining/metallurgy (M)
- agriculture and forestry along with environmental protection (R)
- tourism/catering (T)
- medicine/social services (Z)
- art (S).

Within each vocational area occupations have been classified by thetype of school: vocational school below secondary level, vocational secondary school, post-secondary school.

The training contents, as specified in the ordinance (the Ordinance of the Minister of

Education on the Core Curriculum for Vocational Education of 7 February, 2012) are described as the expected learning outcomes regarding: knowledge, skills and personal/social competences required for the occupations or qualifications specified within the occupation include:

- learning outcomes which are common for all the occupations, including personal and social competences;
- learning outcomes common for the occupations within the educational area, being the foundation for training in an occupation or a group of those;
- learning outcomes specific of the qualifications singled out within the occupations.

The set of the expected learning outcomes, specific of a given qualification, is divided into parts that can be accomplished at the vocational skill courses mentioned in the regulations on continuing education in out-of-school forms.

The ordinance is accompanied by an appendix composed of three parts:

1. Part I outlines the general purposes and tasks of vocational education;
2. Part II determines the learning outcomes that are common for all occupations, learning outcomes common for the occupations within the educational area and learning outcomes singled out within specific occupations;
3. Part III includes a description of education in specific occupations and thus contains: names and symbols of occupations as per the classification of occupations used in the vocational education, names of qualifications distinguished within the occupations, terms of education in specific occupations, minimum number of hours of vocational education and the options for the acquisition of additional qualifications in the occupations forming an educational area within the classification of occupations applied for the purposes of vocational education.

The individual components of the core curriculum have been marked using codes allowing for their identification. The qualifications distinguished within separate occupations are labeled by capital letters indicating the occupational area to which they are assigned and sequential number. The learning outcomes common for all occupations, including personal and social competences, have been denoted using codes made up of three capital letters:

BHP – occupational safety and health;

PDG – starting and running a business of one's own;

JOZ – occupation-oriented knowledge of a foreign language;

KPS – personal and social competences;

OMZ – work organization at small teams (only for the occupations taught at the technician's level – required at the secondary and post-secondary schools).

The learning outcomes common for the occupations within an educational area, being the foundation for training in the occupation or a group of occupations have been marked using a three-letter PKZ code and, additionally (in brackets): a capital letter indicating assignment to an occupational area and a small sequential letter of the alphabet pointing out to the learning outcomes common for the occupation/group of occupations within the educational area.

The connection between areas of vocational education and specific occupations within occupational groups allows for greater training flexibility, thus making it possible to adapt the education to the dynamic changes of the labour market needs. It is also possible to avoid repeating the same contents in the training process, a factor most important when it comes to retraining or gaining additional qualifications in the occupations falling into a common area. An approach like gives added value to the education of adults, the life-long learning (LLL).

A model description of the learning unit (training module)

Dividing occupations into qualifications makes the education flexible and allows the student to supplement his/her qualifications so as to meet the market demand or his/her own needs and to satisfy the student's ambitions. Common qualifications can be found in the occupations trained at the vocational schools below/at the secondary school level. For instance, as regards the *mechatronic assembler* the following qualifications have been identified:

E.3. Assembling mechatronic devices and systems

E.4. Operation of mechatronic devices and systems.

The E.3. qualification is one of the two qualifications distinguished within the mechatronic assembler occupation and provides the foundation for the training in the profession of a mechatronic technician. The mechatronic technician has the qualifications relevant for the occupation, being the superstructure over the E3 basis qualification (these being the qualifications E.18 – Exploitation of mechatronic devices and systems and E.19 - Designing and programming mechatronic devices and systems). Yet another group of common outcomes of an occupational area are the outcomes that provide the foundation for the occupational training, marked using the PKZ.(E.a), PKZ(M.a) and PKZ(M.b) codes.

Qualification		Symbol of occupation	Occupation	Common elements
E.3.	Assembling mechatronic devices and systems	742114	Mechatronic assembler	PKZ(E.a) PKZ(M.a) PKZ(M.b)
		311410	Mechatronic technician	
E4	Operation of mechatronic devices and systems	742114	Mechatronic assembler	PKZ(E.a) PKZ(M.a) PKZ(M.b)
E.18.	Exploitation of mechatronic devices and systems	311410	Mechatronic technician	OMZ PKZ(E.a) PKZ(E.c) PKZ(M.a) PKZ(M.b)
E.19.	Designing and programming of mechatronic devices and systems	311410	Mechatronic technician	OMZ PKZ(E.a) PKZ(E.c) PKZ(M.a) PKZ(M.b)

Table 3: Learning outcomes common for the occupations within an educational area, being the foundation for the training in a group of occupations

Training curriculum for the mechatronic technician occupation

As the relevant ordinance of the Minister of National Education on framework curricula at initial vocational schools provides, the minimum number of vocational education hours shall be 1,600. Out of that general number, 630 hours are assigned, as a minimum, to the theoretical education and 970 hours to practical training.

Within the core curriculum for the education of a mechatronic assembler a minimum number of hours for the vocational education has been specified for the learning outcomes. The number now is:

1. Learning outcomes common for all the occupations and learning outcomes common for the occupations within the area of electricity/electronics being the foundation for the education in the occupation/group of occupations and the area of mechanics/mining &steel industries being the foundation for training in the occupation/group of occupations – 600 hours;
2. E.3. Assembling of mechatronic devices and systems – 330 hours

3. E.4. Operation of mechatronic devices and systems – 150 hours

Modular vocational training **									
Vocational training module		Total number of hours							
		Year 1		Year 2		Year 3		Average weekly number of hours	Total number of learning hours
1	742114.M1 Performance of measurements in electric/electronic systems	5	5	10				10	320
2	742114.M2 Examination of mechanical structures	9	9	8				13	416
3	742114.M3 Assembling mechatronic elements, devices and systems				16	15		15,5	496
4	742114.M4 Exploitation of devices and carrying out activities in the line of mechatronics					4	19	11,5	368
Total number of vocational training hours per week		14	14	18	16	19	19	19	1600

Table 4: Modular structure training curriculum for the Mechatronic Assembler occupation

The exam whereby the first E.3. qualification *Assembling of mechatronic devices and systems* is confirmed takes place at the end of the initial term of the third grade.

The exam whereby the second E.4. qualification *Operation of mechatronic devices and systems* is corroborated takes place towards the end of the third grade.

No.	Module name	Modular units	Tentative number of hours
1	**742114.M1 Performance of measurements in electric/electronic systems**	742114.M1.J1 Observance of BHP regulations	16
		742114.M1.J2 Use of a foreign language in mechatronics	32
		742114.M1.J3 Examination of electric/electronic systems	272
2	**742114.M2 Examination of mechanical structures**	742114.M2.J1 Examination of mechanical structure properties	304
		742114.M2.J2 Use of technical drawing	112
3	**742114.M3 Assembling mechatronic elements, devices and systems**	742114.M3.J1 Assembling mechanical elements, sub-assemblies and units	188
		742114.M3.J2 Assembling pneumatic and hydraulic elements, sub-assemblies and units	144
		742114.M3. J3 Assembling electric and electronic elements and sub-assemblies	164
4	**742114.M4 Exploitation of devices and carrying out activities in the line of mechatronics**	742114.M4.J1 Linking up mechatronic devices and systems	208
		742114.M4.J2 Maintenance of mechatronic devices and systems	112
		742114.M4.J3 Legal environment of business activity	24
		742114.M4.J4 Running a mechatronic firm	24

Table 5: List of module/modular units for the mechatronic assembler occupations

3. Examination procedures

Examination to confirm vocational qualifications – basic information

The following examination committees are established by a relevant legal act to carry out the Examinations to Confirm Vocational Qualifications:

- District Examination Committees (Polish abbr. OKE): Act of 7 September, 1991 on the

System of Education (unified text: Journal of Laws of 1996, No. 67, item 329, with further amendments, the amendment of 28 July, 2011 in particular). Ordinance of the Minister of National Education of 18 February, 1999 on the Establishment of District Examination Committees and Their Territorial Competence (Journal of Laws of 1999, No. 14, item 134, with further amendments)

Regulation of the Minister of National Education of 31 March, 1999 on Granting Charters to the District Examination Committees (Official Gazette No. 12 of 1999, item 169, with further amendments).

- Examination Committees of the Chambers of Crafts: Act on Crafts of 22 March, 1989 – unified text: Journal of Laws of 2002, No. 112, item 979, amended in 2003, Journal of Laws No. 137, item 1304, provides, inter alia, that:
  - master and apprentice examination committees shall be appointed by the competent body of the chamber of crafts; the registered office of the chamber shall become the registered office of the committee;
  - standards being the basis for the master and apprentice exams in the occupations corresponding to a specific craft shall be set forth by the Alliance of Polish Crafts; for the school-taught occupations the standards shall be established by the Minister of National Education;
  - the operation of the examination committees shall be supervised by the Alliance of Polish Crafts;
  - mandatory training of members of the examination committees shall be provided by the chambers of crafts, based the curriculum established by the Alliance of Polish Crafts;
  - examination tasks and questions as well as detailed evaluation criteria shall be approved by the chambers of crafts;
  - the chambers of crafts shall also keep the documentation of the examination committees and the register of the exams;
  - examination fees for the apprentice/master/verifying exam shall be fixed by the chambers of crafts;
  - persons having passed the exams shall be awarded apprenticeship certificates and master diplomas by the chambers of crafts; the documents shall be supplied with round seals with the national emblem of the Republic of Poland.

The exam confirming vocational qualifications can take place at schools, education centres (Practical Education Centres, Continuing Education Centres) or at the employer's, provided that the exam standards are met, at the place indicated by the

- District Examination Committee - OKE (as regards the student/trainee) or
- relevant Examination Committee of the Chamber of Crafts (regarding the young employee),

which are competent for the place where the learning outcomes are to be confirmed.

The exams shall be held by Examination Committees, established to that end by the District Examination Committee (OKE) under the legal regulations on conditions and ways of evaluation, classification and promotion of students and trainees at public schools and the Examination Committees of Chambers of Crafts under the regulations concerning the apprentice and master title exam. The document confirming the vocational qualifications is issued by the OKE or Chamber of Crafts. The practical vocational training of adults ends with the exams confirming vocational qualifications, held by OKE in accordance with the regulations concerning the conditions and ways of evaluation, classification and promotion of students and trainees at public schools as well as holding tests and exams at public schools or with the apprenticeship exam held by the examination committees of craft chambers, in accordance with the regulations concerning the apprentice and master title exams.

The exam confirming occupational qualifications (as of 1 September, 2012)
The exam is held for: ▪young employees ▪vocational school students ▪vocational school graduates ▪graduates of vocational qualification training courses ▪persons eligible to take the exam as external students
The exam is held based on the core curriculum and concerns every qualification embraced by the occupation
The exam may be held at any time during the school year
The exam includes a written part (from 45 to 90 minutes) and a practical one (from 120 to 240 minutes)
The written part can be held electronically (on-line)
The form of the practical part is independent of the type of the school
The practical task is evaluated by the examiner immediately after completion of the practical part
Evaluated by the examiner are: ▪quality of the final result: the product, service or documentation, for meeting the requirements specified in the examination task as contained in the examination chart, ▪quality of the intermediate result, where the evaluation of the latter has direct impact on the evaluation of the final result and is not possible to carry it out upon completion of the examination task contained in the examination chart; ▪performance of the examination task contained in the examination chart for: o observance of the rules of occupational safety and health, o compliance with methods or technologies relevant for completion of the examination task as contained in the examination chart.

Table 6: The exam confirming occupational qualifications (overview)

Description of a typical examination procedure: Procedure of the exam confirming a qualification singled out from the occupation:

1. A declaration to take the exam is filed by a school student with the headmaster.
2. A declaration to take the exam is filed by a school graduate with the director of OKE (District Examination Committee).
3. Besides the data identifying the candidate the declaration shall also contain: the number, occupation name and name of the qualification from the classification of occupations and the number from the core curriculum; the declaration shall be filed not later than 4 months prior to the date of the occupational exam.
4. The written part is held online or by using a hard copy document. The supervising team includes:
    - at school or an education centre – a minimum of three teachers, at least one of them being a teacher employed with another school or centre;
    - at the employer's – at least three employees authorised by the employer in question or by other employers;
    - Where there are more than 30 exam-taking persons in the examination room, the number of the supervising team shall be increased by one person per every additional 20 exam-takers;
    - The supervising team shall not include teachers involved in training activities concerning the subject matter of the exam nor class tutors of the exam-takers.
5. The practical part of the exam shall be held at an OKE-accredited centre: a school, education centre, work establishment. Responsible for the organization and performance of the exam is the Head of the Examination Centre (Polish abbr. KOE) (who, *inter alia*, provides a technical assistant for the exam). KOE appoints Practical Part Supervising Teams (Polish abbr. ZNPC) and heads of the teams.
6. A ZNCP is composed of:
    - at school/education centre: two teachers employed with the school/centre,
    - at the employer's/craftsman's: two employees authorised by the employer.
7. A ZNCP must not include teachers and trainers practically teaching the occupation, who run classes with the exam-takers.
8. The practical part is supervised and evaluated by an examiner (one per six exam-takers).
9. In addition, a technical assistant (nominated by KOE) is present at the exam.

Quality standards of the exams

a) Technical facilities for the examinations

- Providing a register of the operating examination centres
- Development of standards specifying the equipment of the examination centres for all the occupations/qualifications mentioned in the classification of occupations, as used in the vocational education system under conditions of occupational training

b) Examination standards

- Each qualification confirmed separately.
- Vocational exams are made uniform regardless of the type of training (school/out-of-school type).
- A bank of examination tasks is established.
- The practical part of the exam is standardized.
- The written test is solved using a computer.
- Exams held throughout the year.

c) Exam structure

- Written part: a test composed of 40 multiple-choice tasks, time: 60 minutes
- Practical part: a practical test including a single practical task, time: 120-240 minutes (specified in the guidebook)

d) Examination dates

- A vocational exam can be held throughout the year on a date fixed by the head of OKE, in agreement with the head of the Central Examination Committee (CKE).
- The date of the vocational exam shall be announced by the head of OKE not later than 5 months before the vocational exam is held.
- The time-table of the practical part of the vocational exam shall be fixed by the head of OKE and shall be passed to heads of the examination centres (KOE).

e) Scope of exams

The exam confirming occupational qualifications is a form of evaluation of the level in which the exam-taker has mastered the knowledge, skills and competences regarding a specific qualification distinguished within the occupation, as determined in the core curriculum for training in the occupations.

f) Organisation of the exam

- Responsible for the organisation and performance is the head of the examination centre (Polish abbr. KOE) (who, inter alia, provides the participation of a technical assistant for the exam).
- KOE appoints the teams supervising the practical part in individual room (ZNCP) and heads of the teams.
- A ZNCP is composed of:
    - at school/education centre: two teachers employed with the school/centre,
    - at the employer's: two employees authorised by the employer.
- A ZNCP must not include teachers and trainers practically teaching the occupation who run classes with the exam-takers.

g) Requirements concerning the examiners

- The examiner shall be entered in the register of examiners conducting the exams confirming occupational qualifications.
- The examiner shall be appointed by the KOE from among the examiners included in the list passed by the Director of OKE.
- The examiner must not be a teacher employed with the school or education centre where the practical part of the vocational exam is held

4. Conclusion

The Polish system of vocational education and training has undergone transformation. The now developed and implemented Polish Qualifications Framework (Polish abbr. PRK) is aimed to improve the quality of the existing subsystem of education to adapt them to the needs of the labour market and become coherent with what the employers expect. The said PRK is Poland's basic instrument serving the purpose of reformation of the education subsystems (the general elementary education, elementary vocational education, vocational education of the adults, education at the supra-elementary level, higher education) and validation of the learning outcomes for meeting the requirements of qualification transparency at the European level, as specified by the European Qualifications Framework (Polish abbr. ERK).

Originally 7-leveled (2009), the PRK has finally taken the shape of an 8-level scheme – its 5th level being regarded as an intermediate one between the post-secondary (level 4) and higher education (level 6). The level is "void" for the time being, but it can soon be "filled up" by new qualifications, both those academic (resulting from a shortened training cycle) and the

technologically advanced vocational qualifications. The said is a good example to illustrate the shift from the input-oriented system of determining the levels of qualifications by taking into account the country's institutional structures to the output-oriented concept basing on learning outcomes. And thus PRK makes it possible to use the qualification levels as a point of reference not only for the existing qualifications (subscribed to the domestic institutional structures), but also for the qualifications that are being under development or have been recently created.

For many years employers have been complaining about the employees-to-be being insufficiently prepared to doing work in specific occupations. Despite heavy attempts done on the national level, such as National Qualification Framework, National Standards of Competences, new occupational core curricula (based on the learning outcomes approach) being implemented, efficiency and flexibility in that respect is still unsatisfactory. One of the solutions allowing to overcome the barrier is the modularization of occupational education curricula. The employers suggest gradual diverting from the occupations, to be replaced by the notion of a "professional profile" containing learning outcomes resulting from the context of company operation. Such an approach, combined with the modular training technology, will make it possible to flexibly adapt the learning units (within the educational modules) to the needs of the companies. Since the beginning of the year 2014 the government decided to implement the new inter-ministerial taxonomy of qualifications. That means that it is going to follow the direction mentioned above, i.e. adjusting of learning offer to qualifications (and not occupations as it is now) using the modular technology in vocational education and training in Poland, where each module respond to certain units of learning outcomes forming a qualification.

Considering the said, the newly created training curricula (the mechatronic sector being no exclusion) should not only have modular nature, but should also be supported by appropriate stakeholders and decision-makers in preparing the appropriate set of instruments allowing to bridge two worlds (the world of education and the world of work) to allow a proper use of the knowledge and skills acquired, as required by the working environment.

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