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GT VET

**Greening Technical VET – Sustainable Training Module for
the European Steel Industry**



Work Package 3

**Analysis of VET Systems Reflecting Anticipated Future
Requirements**

National Report

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POLAND

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1. Vocational education system in Poland

Vocational education system in Poland, in frames of national education system (Appendix), consists of:

- secondary vocational schools (*zasadnicze szkoły zawodowe, ZSZ*);
- technical colleges (*technika*);
- technical colleges offering complementary education (*technikum uzupełniające*)¹
- post-secondary vocational schools (*szkoły policealne*).

Graduates of all the above mentioned vocational schools take vocational exams (*egzamin potwierdzający kwalifikacje zawodowe*, most often called *egzamin zawodowy*) provided chosen profession is included in the classification of vocational professions (*klasyfikacja zawodów szkolnictwa zawodowego*)². This classification defines education pathways for 199 professions.

Graduates of secondary vocational schools after passing vocational exam may continue education in technical colleges offering complementary education, pass 'matura' exam, enrol university, and eventually obtain B.A. or M.A. degree. Graduates of technical colleges and technical colleges offering complementary education may also pass 'matura' exam that enables them enrolling university education and eventually obtaining B.A. or M.A. degree. Graduates of post-secondary vocational schools - to enrol post-secondary vocational school one has to complete high school education, but is required to hold 'matura' exam - also pass vocational exam and obtain the title of technician (*technik*). Additionally, vocational education can be provided by employers-craftsmen: they provide vocational education in 103 professions, out of which 53 are included in the classification used

¹ Technical college offering complementary program can be enrolled only by graduates of secondary vocational school, who want to pass 'matura' exam; a three-year- technical colleges offering complementary program were established in 2002 as a result of education system reform. Technical colleges offering complementary program and profiled high schools are to stop recruiting pupils in 2012. Profiled high schools (*liceum profilowane*) were also created in 2002 and replaced vocational high schools (*liceum zawodowe*); profiled high school is a three-year school, which ends by passing 'matura' exam, there are 14 profiles of such high schools.

² Current classification dates back to 2007 (*Rozporządzenie Ministra Edukacji Narodowej z dnia 26 czerwca 2007 r. w sprawie klasyfikacji zawodów szkolnictwa zawodowego*, Dz. U. Nr 124, poz. 860).



by vocational schools - it means that they may have their vocational qualifications confirmed by passing external vocational exam.

Apprenticeships are offered within a framework of vocational education as a part of education curricula (more on this later in point 3); young people can enter relationship with experienced employee to receive on-the- job practical training - it is often provided within the framework of employment contract aimed at offering professional education (*umowa o pracę w celu przyuczenia do zawodu*). It is also possible to follow training programme at the center for vocational education (*centrum kształcenia zawodowego*).

This report concentrates on vocational education received within the framework of vocational education system, namely at secondary vocational schools, technical colleges and technical colleges offering complementary education and post-graduate vocational schools. The issue of continuing vocational training (CVT) has not been discussed as nor relevant for GT VET project.

1.1 The 1999 education system reform

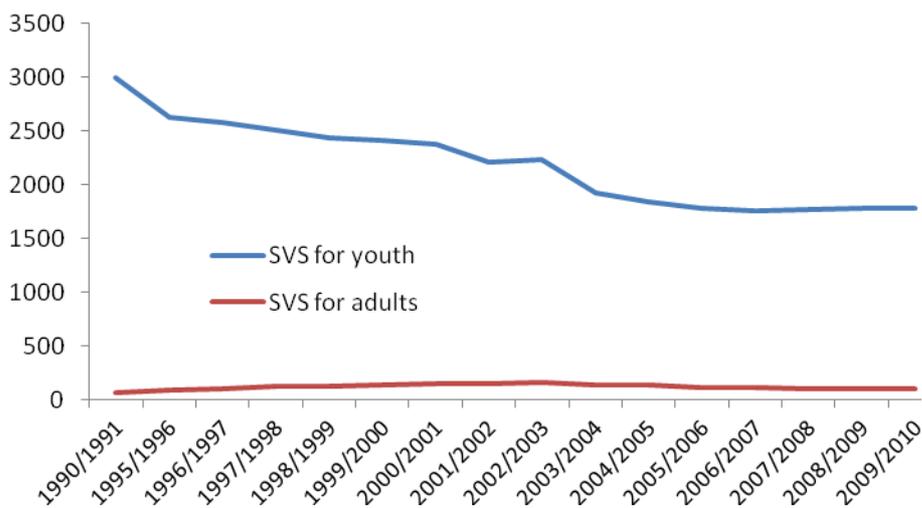
The reform of 1999 has had a profound impact on organization of vocational education system in Poland. It was aimed at promoting secondary level education, improve its quality and became more practice- and skills-oriented at all levels. The reform implied that primary school was shortened by two years (to six years) and the institution of a three-year junior high school has been introduced. After graduating from junior high school, pupils enrol one of the senior secondary schools: three-year high school, four-year technical college, a two- or three-year secondary vocational school or a three-year profiled high school. New element was also introducing system of external exams, which are carried out by the Central Examination Board (*Centralna Komisja Egzaminacyjna, CKE*) together with district examination boards. In the last year of education at primary school and junior high schools pupils take external exams to access the next level of education. Graduates of high schools, technical colleges, technical colleges offering complementary education and profiled high schools take 'matura' exam. One of the main challenges of the 1999 reform was



introducing external exams - the first ones took place in 2002 (school year 2001/2002).

The 1999 reform has had profound consequences for vocational education system: many secondary vocational schools have been closed down, also the ones functioning within enterprise structure (*przyszkółkowe szkoły zawodowe*). The graph below presents number of secondary vocational schools between 1990 and 2010, which was gradually decreasing till 2004; since 2004 the number of schools has remained at a similar level.

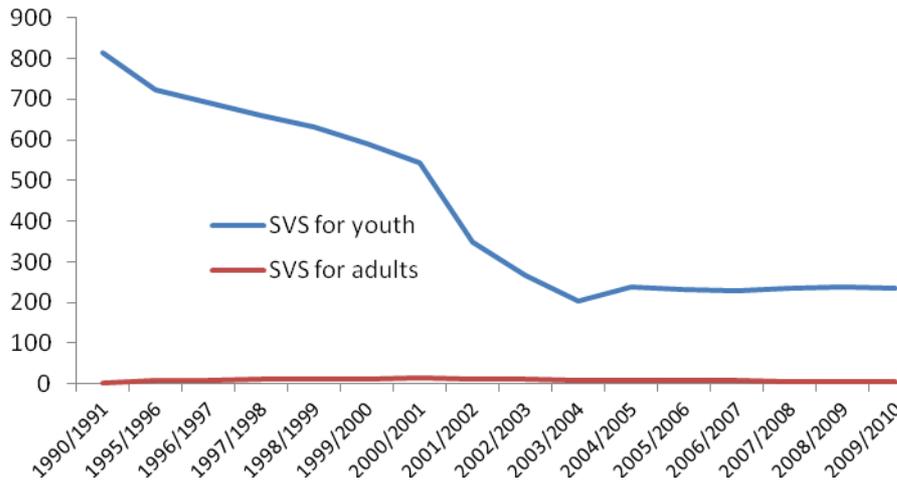
Graph 1. Secondary vocational schools in Poland (1990-2010)



Source: Polish Steel Association (HIPH) based on the Central Statistical Office data (GUS), 2010.

As a result of introduced changes and promotion of higher education between 1990 and 2010 the number of pupils in secondary vocational schools was decreasing. The graph below presents trends observed between 1990 and 2010.

Graph 2. Pupils in secondary vocational schools in Poland (1990-2010, thousand)



Source: Polish Steel Association (HIPH) based on the Central Statistical Office data (GUS), 2010.

In school year 2010/2011 there were 235.7 thousand pupils at secondary vocational schools - 57% fewer than in 2000 and 71% fewer than in 1990. Taking into consideration demographic trends, decreasing birth rate and rather negative image of vocational education, more secondary vocational schools may be closed in the nearest future.

Many employers from sectors that need workers with technical skills criticize decision to close down secondary vocational schools and dismantle vocational education system. They agree that secondary vocational schools organized within the structure of an enterprise were often not efficient, but point out that closing down regular secondary vocational school significantly contributed to shortage of technical skills employers face at the moment.

2. National 'green' skills³ and policy initiatives - influence on VET

Comprehensive approach to developing 'green' skills in Poland is missing, so are appropriate policy initiatives. Government activities are usually limited to raising

³ For the purpose of this paper 'green' skills are understood as skills necessary to adopting products, services and ways of operating to challenges linked to climate change and relevant regulations.



general environmental awareness and encouraging pro-environmental behaviours. 'Green' awareness of enterprises increases very slowly, especially among SMEs: while asked about the need of 'green' skills over 82% of respondent indicated there was no need for such skills⁴.

2.1 Policy documents

The National Polish Ecological Education Strategy was adopted in 2001. It defines national goals for environmental education and sets its priorities. The first operational programme, adopted also in 2001, was the National Polish Ecological Education Programme, which specifies institutional framework, measures and founding sources. According to this document, the reform of 1999 has strengthened importance for environmental education by extending mandatory education up to the age of 18 and providing school directors with more freedom in designing education curricula. Starting from 4th-6th grade (the second level of primary education) it is possible to introduce education pathways (*ścieżki edukacyjne*), which can become a part of various subjects or can be taught during separate lessons. One of such education pathways is "environmental pathway". The underlying principle for introducing "environmental pathway" is that the basic education curricula should be used to convey pro-ecological message to pupils⁵.

According to ECORYS report of 2010 "Programmes to promote environmental skills" many of the environment-related programmes and courses concentrated on general ecological education and are addressed to pupils from primary and secondary schools⁶. These are mainly programmes aimed at increasing overall 'green' awareness and also training programmes for teachers to enhance their skills and competences in the field of environmental education. Duration of environmental training programmes can vary from a several-hour workshop to a three-week summer school (i.e. the Sendzimir Foundation programme titled "Challenges of

⁴ M. Kubisz, *Rozwój umiejętności i szkolenia w MŚP. Analiza subregionu sosnowieckiego, Polska* [Skills development and training in small and medium size enterprises. Analysis of the sosnowiecki sub-region, Poland], OECD, Paris 010, p.38 (available at: <http://www.oecd.org/dataoecd/41/38/46738591.pdf>).

⁵ *The National Polish Ecological Education Programme*, Ministry of Environment, Warsaw 2001, pp. 13-15.

⁶ ECORYS, *Programmes to promote environmental skills*, 30 June 2010 (available at http://ec.europa.eu/environment/enveco/industry_employment/pdf/environmental_skills_report.pdf), p.58.



sustainable development in Poland”, addressed mainly for students, Ph.D. candidates and employees⁷).

2.2 Funding of environmental programmes

ECORYS points out that quite an important number of projects financed or co-financed by ESF addressed to Polish employees or unemployed involve ‘green’ skills training. Majority of these projects have been implemented under Priority II (national, “Development of human resources and adaptation potential of enterprises and improvement in the health conditions of working persons) or Priority VIII (regional, “Regional human resources of the economy”). Among the most often developed ‘green skills’ one finds: environmental management in enterprises, quality and environmental management systems audit, renewable energy, energy audits and advice as well as energy performance certificates audit⁸. It is important to note that ‘green’ components of the projects are not government-driven and they are entirely a result of their promoters initiative, very often environmental NGOs. According to the ECORYS report equal proportion of workers with high skills and medium skills (approx. 45%) participates in environmental courses, while only 10% of workers with low skills takes part in such courses⁹.

Another important source of funding for environmental skills training are funds for environmental protection and water management, which are operating on national, regional and local levels (poviat and *gmina* levels). Training programmes provided within the framework of these projects is a part of CVT, therefore it will not be studied in depth.

In conclusion it can be stated that:

- There is no national policy on ‘green’ skills or ‘greening of jobs’;
- ‘Green’ skills training programmes are usually initiative of a promoter, quite often an NGO active in the field of environmental protection;
- Training on ‘green’ skills’ is very often a part of CVT programmes, therefore it is not addressed to pupils from vocational schools;

⁷ ECORYS, op.cit., pp.94-97.

⁸ Ibidem p. 29.

⁹ This finding is also confirmed in M. Kubisz, op.cit., p. 51.



- Majority of the programmes are financed by either participants or enterprises (training for employees);
- There are no separate modules/lessons on 'green' issues within the framework of vocational education – there are only optional educational “environmental pathways”.

Apart from general promotion of environment awareness and 'soft' encouragement to introduce environmental pathway into education curricula, there are not any other initiatives that would influence vocational education in Poland; in most cases environmental aspects are related to H&S requirements.

3. National apprenticeship system for mechanical and electrical technicians

Rationale and some practical aspects of apprenticeship system organization have been presented in the next paragraphs. We also address some issues related to implementation and evaluation of the current apprenticeship programme.

3.1 Rationale/background to apprenticeship framework

Regulation of the Minister of National Education of 15 December 2010 on practical aspects of vocational education stipulates that there are two categories of apprentices: pupils and students of secondary high schools that offer vocational education and young workers (*pracownicy młodociani*) aged 16-18, who follow on-the-job vocational training within the framework of professional training contract (*przygotowanie zawodowe*). This regulation stipulates that practical vocational education (*praktyczna nauka zawodu*) is organized by school, and for young workers by employer, with whom professional training contract was signed. Practical vocational education is organized in two forms: practical assignments (*zajęcia praktyczne*) and apprenticeship (*praktyki zawodowe*). Practical assignments are organized for pupils and young workers to equip them with skills required by the given profession; apprenticeship is organized for pupils (but not young workers) in order to enable them applying vocational knowledge and skills in real business



environment. Both mechanical and electrical technicians are subject of practical assignments and apprenticeship.

3.2 Types/Titles of Relevant Apprenticeships

Apprenticeships can be organized throughout school year and during summer holidays. When practical vocational education is organized outside school, school director signs agreements with partner organization (enterprises) receiving apprentices. This agreements stipulates: apprenticeship beginning and end date, partners' rights and obligations and partners' share in apprenticeship funding. Vocational education program is appended to the signed agreement. School is responsible for monitoring realization of the programme, accident insurance, approval or recruitment of vocational instructors from within enterprise, reimbursement of travel costs for commuting apprentices, and, for those who cannot commute, i.e. due to a too long distance to enterprise where apprenticeship is organized, provision of free accommodation and daily allowance. Partner institutions accepting apprentices are obliged to ensure appropriate facilities for vocational training (i.e. training job posts with necessary equipment, technical documentation, protective clothes and shoes, free meals and drinks in case of physical work that requires regular calories intake); employer is also obliged to familiarize young employees or apprentices with work organization, work rules and H&S regulations. These stipulations are relevant for apprenticeship organized for both mechanical and electrical technicians.

The regulation of the Ministry of National Education of 23 March 2009 on framework education programs in public schools defines the number of hours for specific subjects in different types of school, however, it does not define relation between vocational education and the overall education programme. In case of technical colleges pupils during four years of education are to have 50 hours of vocational education a week (out of the total of 129 hours of lessons weekly)¹⁰. In case of

¹⁰ These 50 hours are calculated by adding the number of vocational education during an example week in each grade, i.e. 8 hours in the first and second grade, 10 hours in the third grade and 14 hours in the fourth grade. The regulation does not define how many hours of practical vocational education shall be provided in each grade.



technical colleges offering complementary education pupils during three years of education are supposed to have 31 hours of vocational education a week (out of the total of 85 hours)¹¹. In case of electrical technician there are 5 hours a week of practical vocational education in the second grade only, which implies that the remaining 45 hours is allocated to theoretical vocational education. In case of mechanical technician there are 5 hours a week of practical vocational education in the second and the third grade, which implies that the remaining 40 hours is allocated to theoretical vocational education. On the top of that, in case of both professions, there are 160 hours (4 weeks) of apprenticeship in the third grade of technical college. According to the new regulation (not in force, under social consultation) apprenticeship shall remain unchanged in case of electrical technician (160 hours, 4 weeks) and shall be extended in case of mechanical technician (280 hours, 7 weeks), and divided into two parts – there are no details how it shall be organized, most likely one part in the third grade and the second one in the fourth grade.

3.3 Levels of apprenticeship

There are not any specific levels of apprenticeship in the Polish system. General framework for skills and knowledge required for electrical and mechanical technicians is defined in the regulation of the Minister of Education on vocational education for some professions of 15 December 2010. This regulation defines framework program and organizational requirements, description of school's technical facilities and HR requirements etc. The exact scope of knowledge and skills that shall be acquired by pupils during both practical vocational education and apprenticeship as well as the number of hours is defined by individual school director. Limits as to the maximum number of practical vocational education hours per day are related to pupil's age: they cannot exceed 6 hours in case of pupils younger than 16 years old, and 8 hours in case of pupils over 18 years.

¹¹ Calculation as above.



Regulation of the Minister of National Education of 8 June 2009 on education curricula and approved textbooks delegates the responsibility for designing education curricula to teachers. Later these education curricula are approved by school director. He/she may ask for opinion vocational education teachers with subject-related knowledge, consultants, pedagogical advisors or specialists in the area of this particular profession. Individually-designed education curricula are introduced in average in each fifth school and fourth centre for practical training. In practice, teachers most often use old vocational education programmes designed at the ministerial level.

Organisation of apprenticeship and its detailed programme are responsibility of vocational education teacher(-s)/school director. National apprenticeship programs do not exist, however, there is an indicative programme for mechanical technician, which teachers may use, but are not obliged to¹². This programme proposes the following allocation of vocational education hours: introduction (8 hours), design, treatment, assembly and quality control (56 hours), maintenance (40 hours), tool-shop (16 hours), marketing (32 hours), wrap up (8 hours).

3.4 Components of apprenticeship programme

Among vocational qualifications required by mechanical and electrical technician there are no qualifications related directly to environment. However, rational energy management and appropriate organization of job post in line with H&S regulations, fire safety measures and ecology are mentioned. Both professions are perceived as wide-profile profession, which implies that at the very last stage of vocational education specialist training shall be realized (i.e. specialization in such areas as energo-electronics, electrical installations assembly etc. for electrical technicians).

3.4.1 Mechanical technicians

Apprenticeship can be organized at school shops, in practical training centres (*centra kształcenia praktycznego, CKP*), in continuing education centers (*centra kształcenia*

¹² Former Ministry of Education, *Education curricula – mechanical technician*, Warsaw 2006 (available at: [http://pliki.koweziu.edu.pl/programy/przedmiotowe/Technik_mechanik_311\[20\]_2006_02_06.pdf](http://pliki.koweziu.edu.pl/programy/przedmiotowe/Technik_mechanik_311[20]_2006_02_06.pdf)).



ustawicznego, CKU) or in enterprises. Required qualifications are grouped into five thematic blocks:

- General technical: a.o. 2D&3D statics, elements of machines and mechanisms theory, basics of stress resistance;
- Mechanical technology: basics of physical metallurgy, metallurgical processes, thermal & thermo-chemical treatment, foundry, technology of machines assembly, quality control;
- Theory of machines: energy and energy conversion, hydraulic driver systems, automatic elements and systems;
- Basics of machines construction and exploitation: basics of machines construction, shafts and axles, exploitation process of machines and devices, technical and operational documentation, H&S at work, fire safety and environment protection;
- Entrepreneurship basics: organizational and legal forms of economic activity, economic analysis in enterprise, marketing strategies, H&S rules, fire safety and environment protection, quality management system, further professional education and development.

Table 1. Allocation of hours in specific thematic blocks - mechanical technicians

Thematic block	Minimum number of hours in the vocational education cycle based on the previous educational attainment (in %)		
	Primary school	Secondary vocational school	High school, Profiled high school, Technical college Technical college offering complementary programme High school offering complementary programme
General technical	25	25	23
Mechanical technology	20	12	20
Theory of machines	10	16	12
Basics of machines construction and exploitation	20	22	20
Entrepreneurship basics	5	5	5
Total	80	80	80

Source: Ministry of National Education, Education curricula – mechanical technician, Warsaw 2006.

Each school allocates remaining 20% of the total number of hours to subjects/issues related to local labour market needs and profession specificity.



3.4.2 Electrical technicians

Apprenticeship can be organized in enterprises - employer is responsible for realizing adopted program for a given specialization and provide pupil with appropriate training job posts, practical training centre (*centrum kształcenia praktycznego, CKP*) or at school premises, in school shop/laboratory. The need to sensitize future electrical technicians towards environment issues, especially environmental impact of their job, is underlined in the profession description prepared by the Ministry of National Education.

Required qualifications are grouped into four thematic blocks:

- Electro - technique and electronic basis;
- Equipment and electronic devices;
- Production techniques;
- Basics of professional activity.

Allocation of hours in specific thematic blocks for electrical technicians is presented in the table on the following page.



Table 2. Allocation of hours in specific thematic blocks - electrical technicians

Thematic block	Minimum number of hours in the vocational education cycle based on the previous educational attainment (in %)		
	Primary school	Secondary vocational school	High school Profiled high school Technical college Technical college offering complementary programme High school offering complementary programme
Electro - technique and electronic basis	22	20	20
Equipment and electronic devices	50	59	50
Production techniques	13	6	15
Basics of professional activity	5	5	5
Total	90	90	90

Source: Ministry of National Education, Education curricula – electrical technician, Warsaw 2010.

Each school allocates remaining 10% of the total number of hours to subjects/issues related to local labour market needs and profession specificity.

One of the suggested improvements of the apprenticeship system is to increase the share of practical education in overall education. Many employers already cooperating with schools would welcome more school involvement, and school director in a role of initiator of joint initiatives. They also believe that the previous vocational education system was more practice-oriented than the present system. It was suggested that it would be desirable to come back to the apprenticeship organized in 'day blocks', not in 'hour-block' as it is today. It would enable pupils to spend the whole day in the enterprise and avoid dividing such a day into 'enterprise' and 'school' part¹³.

3.5 Mandatory and optional learning outcomes/achievements

There are no any special 'green'/environmental modules in the education curricula foreseen for mechanical and electrical technicians. If 'green' elements are introduced into other subjects within the framework of environmental pathway, they may be

¹³ Analysis of practical aspects of vocational... op.cit., p. 215



evaluated as a part of partial/final exam from the subject. Environmental considerations are perceived as leitmotiv and horizontal issue in education; the practice shows that very often it is at a discretion (and preparation) of the teacher to present it, quite often it does not go beyond a general promotion of the 'save the nature' idea. As illustrated above, in both cases H&S modules are a part of thematic blocs on entrepreneurship or production basics.

Example 1. Ecology aspects in practical vocational education at the Centre of Technical Schools (*Zespół Szkół Technicznych*) in Kwidzyń

Ecology aspects include the following:

- utilization of metals scraps and other waste;
- waste segregation (separate containers for plastic, paper, glass);
- utilization of used materials such as oil, lubricants etc.;
- one of the evaluated criteria during the final exam of the practical vocational education is treatment of waste.

Source: interview with one of the vocational education teachers, October 2011.

3.6 Implementation

In case of both professions in question vocational education and practical vocational education is mainly organized at schools. Apprenticeship is organized in enterprises or other training centres. The only entry requirement is successful completion of required subjects. Minimum duration of training is 160 hours for both professions. In general, the number of theoretical education prevails, which is strongly criticized by employers. Employers' representatives are hardly ever involved in designing apprenticeship programme; at the same time education curricula are often criticized by employers as too theoretical and not providing skills required by modern production processes and technologies¹⁴.

Vocational education teachers are also not very happy about the current organization of apprenticeship. They point out that in many cases pupils are treated as 'obstacle'

¹⁴ *Badanie funkcjonowania kształcenia zawodowego w Polsce. Raport końcowy*, Ministerstwo Edukacji Narodowej [Analysis of practical aspects of vocational education in Poland. Final report, the Ministry of National Education], Warsaw, February 2011, p. 97, <http://www.efs.men.gov.pl/projekt5-aktualnosci/item/629-raporty-na-temat-ksztalcenia-zawodowego>



in enterprises where apprenticeship is organized, they are not given appropriate professional tasks that would develop their knowledge. Vocational instructor is usually one of the employees, but experienced employees are not keen on receiving apprentices as this is additional burden. Mentoring responsibilities are not additionally rewarded, and instructing is not written into job description. Moreover, vocational instructors are responsible for health and safety of apprentices and can be held responsible financially for apprentice's mistakes.

3.7 Achievement and progression

Graduates from all vocational schools can take vocational exam to have their qualifications confirmed. Vocational exam is based on external standards proposed by the Central Examination Board and later approved by the Minister of Education¹⁵; external standards are adopted for each profession. Vocational exam is knowledge- and skill- based and consists of two parts - written and practical one. There are three requirement areas in the first (written) part of the exam:

- comprehensive reading of descriptions, instructions, graphs, drafts, technical and technological documentation;
- numerical and operational data processing;
- safe performance of professional tasks according to H&S regulations, fire safety rules and environment protection.

Written exam has two parts: the first part of the written exam is to assess knowledge and skills required for qualification in a given profession, the second part of the written exam is to assess knowledge and skills related to employment practice and running economic activity. Practical exam is to assess skills required for a given profession; it is organized in a form of practical test. To pass such an exam candidate is required to obtain 50% from the first part of the written exam, 30% from the second part of the written exam and 75% from the practical exam¹⁶. Both parts of the

¹⁵ Currently the regulation of the Ministry of National Education of 10 March 2010 on vocational standards as basis for vocational exams.

¹⁶ According to art.127 of the regulation of the Minister of National Education as of 30 April 2007 on assessment conditions and methods, classification and promotion of pupils and students and organization of exams in public schools practical exam can be passed at school, examination institutions or at the employer premises – in such a case all three are called examination centers.



vocational exam (written and practical) have to be passed to obtain diploma confirming professional qualifications.

External institutions involved in vocational exams organization are the Central Examination Board and eight district examination councils; pupils are evaluated by a team of external evaluators. Vocational exams are organized once a year¹⁷.

No information is available on assessment of 'green' skills and/or environment-related knowledge.

According to the recent report on assessment of vocational education in Poland vocational exam in its current form is perceived as not very effective. The main drawback of the exam is its optional character – graduates are not obliged to pass it, and quite often they are satisfied with certificate confirming graduation from a given school. Since not mandatory, vocational exam is not valued by teachers and graduates. Practical exam in a written form is also highly criticized as it does not enable to demonstrate acquired skills¹⁸.

3.8 Statistical data¹⁹

In the school year 2009/2010 in Poland operated 3173 technical colleges, technical colleges offering complementary education and art schools counting 612.5 thousand. students. Technical colleges were 1907. The number of technical colleges decreased: in the year 2005 there were in Poland 2105 technical colleges, in the year 2006 - 2085, in the year 2007 - 2068, and in the year 2008 - 1990.

The number of students increased over the period 2005-2009:

- year 2005 490 449 students,
- year 2006 509 917 students,
- year 2007 516 409 students,
- year 2008 517 256 students,

¹⁷ Art. 110.1 and art. 137 of the regulation of the Minister of National Education as of 30 April 2007 on assessment conditions and methods, classification and promotion of pupils and students and organization of exams in public schools; last amendments were introduced on 16 February 2011.

¹⁸ *Analysis of practical aspects of vocational...*, op.cit., p. 130.

¹⁹ *Analysis of practical aspects of vocational...*, op.cit., p. 57-64.



- year 2009 517 134 students.

The share of technical college student which passed the final professional exam over the period 2006-2009 was:

- year 2006 61.30%,
- year 2007 50.90%,
- year 2008 50.90%,
- year 2009 56.30%..

Actually in Poland operate 259 technical colleges educating electrical technicians
556 technical colleges educating mechanical technicians.



Appendix

Education system in Poland

Appendix

Education system in Poland

