Case study Lithuania

The future of vocational education and training in Europe
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Delivering IVET: institutional diversification and/or expansion?

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Chapter 1. Introduction

This case study will explore the change of the VET provision in terms of curriculum design and development and change of the institutional settings from 1995 to 2020. Several points are important to consider when analysing these changes in Lithuania.

Specificity of the transformation pathway defined by the post-communist transition in the last decade of the 20th century, when the key reforms of VET started. This specificity implied a strong orientation to the development of skill formation according to the requirements of market economy and market-based economic restructurings. Two competing orientations of the mission of VET have emerged in this period and remained dominant since then – enhancing competitiveness of the market economy from the one side, and fostering employability and employment as the key measure to deal with the risks social exlusion and powerty from the other side (Dienys, Pusvaškis 1998; Laužackas 2005). The above mentioned transitional character of the VET change and reform defined rather strong attachement of practitioners and policy makers to the policy borrowing and policy learning, especially in the fields of qualifications and VET curricula (Tūtlys, Kaminskienė, Winterton 2016). There can be noticed some dynamics in terms of content and institutional arrangements of policy borrowing and policy learning. The first reforms of VET curricula launched in 1997 were oriented to "British" competence-based approach to VET curriculum design: introduction of competence in the VET standards and curricula changed the approach and practice of curriculum design but did not change the subject-based didactic practices in the school-based VET system (Tūtlys, Kaminskienė, Winterton 2016; Spöttl, Tūtlys, 2017).

The systemic introduction of the competence-based curricula with the implementation of Lithuanian Qualifications Framework, occupational standards and modular VET curricula in the second decade of the 21st century involved the change of VET provision practices (development of work-based learning and apprenticeship, modularisation of VET provision) but they are very slow and iterative due to the lack of institutional capacities. The change of VET in this period has also been significantly influenced by the different critical junctions of the institutional development at the macro-level, such as accerssion of the EU in 2004 which enabled essential support for the implementation of the different VET reforms and initiatives, as well as economic crises of 1999 and 2008-2009, which significantly fostered emigration and had destructive effect on the social dialogue in the field of skill formation. Nevertheless the EU accession marked more systemic approach to development of the VET curricula, qualifications and institutional pathways of the VET provision aligned with the development of the national system of qualifications in the context of the skill formation agendas of the EU.

These and other developments will be analysed in this document by referring to the relationships and boundaries between general education and IVET at the upper secondary level, development of the VET qualifications and curricula at the level 5 of the LTQF (EQF), changes of the relationships between the IVET and CVET and evolution of the institutional settings and framework in the VET provision. The timeframe of analysis is 1990 – now, because the initial date of this timeframe marks the beginning of the restituted statehood of the country and start of the reforms of education and VET.

Chapter 2. Blurring of boundaries between general education and IVET at upper secondary level

Lithuanian VET system is characterised by the strong links with the provision of general education. Provision of the general education in the VET schools was inherited from the Soviet VET system together with the network of the VET establishments and their pedagogic staff. However, in the Soviet period VET system played the role of rather discriminatory separator youth, when after the examinations at the completion of general basic education (9-10 years of studying) the "capable students" were directed to the continuation of learning at the secondary schools, whereas "incapable" were being transferred for training in the VET schools with the possibility to acquire general secondary education enabling to access HE (mostly in the "technological" fields of studies) (Poviliūnas 2000; Laužackas 2005; Dienys, Pusvaškis, 1998). This feature predefined the image of VET as "asylum" of young people with the lack of capacities and motivation to learn and to study.

The boundaries between general education and IVET at upper secondary level have been changing in the last 30 years. Here we can distinguish several key changes and related junctures:

1. **Establishment of the school-based VET system by transforming the Soviet 'dual' VET model in 1990.** This stage involved de-ideologization of the VET curricula, delegating autonomy for curriculum design to the VET schools and teaching staff, enhancing cooperation and partnership between the VET schools, local employers and regional authorities (Laužackas 2005; ETF 2002; Tūtlys and Kaminskienė 2008).

2. **Implementation of the competence-based VET standards in the period of 1997-2008**. This reform did not create particular changes in the relationship between the provision of the general education and vocational training in the VET schools, because it was merely focused on the internal formal restructuring of the VET curricula and did not challenge school-based practices of the organisation of learning and training in the VET schools and related methodical approaches (Laužackas, Tūtlys, Spūdytė 2009; Tūtlys, Aarna 2017). Provision of general education in the VET establishments was considered by the policy makers as important precondition for the improvement of the social status of the VET graduates and enabling better permeability between the VET and higher education studies. VET suffered significant loss of esteem comparing to HE during the first two decades of the independent state what resulted in the significant dis-balance of the flows of the youth to the VET and HE. This problem was being constantly raised and discussed both by policy makers and employers and strengthening of the quality of general education in the VET establishments was considered as one of the measures to improve permeability between the VET and HE and thus to improve the image of VET.

3. **Development of the national system of qualifications.** Development of the national system of qualifications started in 2007-2008 and at the beginning it was focused on the enabling and improvement of the systemic provision of vocational and professional qualifications according to the labour market needs, i.e. the focus of the national system of qualifications did not "cover" general education. The first drafts of the National

Qualifications Framework were referencing only vocational and professional qualifications whereas general education was considered only as precondition for the acquisition of these qualifications and it's credentials were not considered as objects for referencing to NQF (Tūtlys and Spūdytė 2011; Laužackas, Tūtlys, Spūdytė 2009). This approach changed during the process of referencing NQF to the EQF, which disclosed that narrow focus on vocational and professional qualifications can become a significant obstacle for the implementation of the lifelong learning principle. As a result the Lithuanian Qualifications Framework accepted in 2010 was opened for the all types of qualifications and credentials, including general education credentials, where the certificate of basic general education was referenced to the LTQF level 3 (EQF 3), secondary education – to the LTQF level 4 (EQF4).

4. **Introduction of competence-based occupational standards and modularised VET curricula in the period of 2013-2018** had rather controversial implications for the relationships between the general education and VET. From the one side, descriptors of qualifications in the occupational standards contain the references to general education as a precondition for the access to training or studies for the access to qualification, as well as educational requirement for the recognition of vocational or professional qualification (depending on the level of the LTQF). From the other side, modularisation of the VET curricula on the national level involved stronger separation between the provision of VET and general education in the VET schools in terms of organisation of educational process and curricula. Besides, stronger orientation of the VET policy makers, social partners and VET providers to strengthening of the work-based learning (introduction of apprenticeships, sectoral practical training centres) also contributed to further separation in the provision of VET and general education.

For the last few decades, Lithuanian VET institutions have been running three-year VET level IV qualification programs (young people with 10th grade of general education are admitted to these programs), after which a person is issued a certificate of completion of secondary education and a diploma confirming the awarded professional qualification. Several VET institutions also run several Level 3 VET programs, which lead to a diploma certifying the acquisition of the relevant professional qualification. The only significant change in this area is that from September 2020 gymnasium students in general schools will also be able to study in VET schools. After assessing their personal abilities and workload, they can already enter one or more modules of the VET program. By choosing one module at a VET school, a gymnasium student will be able to have 3 to 6 lessons per week, and such learning will last from one to two years. Such a pupil, together with his or her general education school and VET school, will draw up an individual learning plan so that the maximum weekly number of 35 lessons is not exceeded. Both schools will work together to coordinate a student-friendly lesson schedule. This possibility is regulated by the above-mentioned Description of the Formal Vocational Training Procedure (Item 10, https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.420810), the new version of which was approved by the Minister of Education, Science and Sports of the Republic of Lithuania on 30 May 2020.

Until the new Law on Vocational Education and Training approved by the Seimas of the Republic of Lithuania on 14 December 2017 fully entered into force on 1 January 2019,

integrated VET programs - usually older than 5 years - dominated in IVET in Lithuania. At that time, several modular VET programs were prepared and are already being implemented, but only the new Law instructed to make all VET exclusively modular (Article 2.17) from the first day of January 2019. In the past, there have been many comments on the lack of practical skills of VET graduates and the mismatch between skills acquired in VET and the functions and operations performed in the workplace, but this change has made it possible to personalize training content and better adapt it to the workplace needs. As VET programs in Lithuania are developed on the basis of vocational standards, the new Law also provided that the standards must be reviewed and updated at least once every five years (Article 14). And the relevant VET programs must be reviewed and updated accordingly no later than 12 months after the entry into force of the update of the standard (Article 13.10). By the end of July 2020, 23 vocational standards had been updated and approved, covering essentially the full range of both VET and higher education programs in Lithuania. The lists of required knowledge and competences assigned to each qualification level of a given group of occupations in the standards have significantly changed the previous balance of skills, knowledge and competences. In the past, VET standards were dominated by professional knowledge, and now, given the realities of the labour market, the occupational standards and modular VET curricula have focused more on occupation-specific skills, general subject knowledge, and transversal skills and competences.

Example. Comparison of the VET standard and occupational standard in the field of electrical and electronic workers

The VET standards developed in the period of 1997-2008 were based on the functional analysis starting from the identification of the occupational fields of activities and related competencies.

VET standard of the Electro-mechanic of electric equipment (level 3) approved in 2001. There are distinguished 7 fields of activities: assembling of electric equipment, assembling and exploitation of the low-voltage electric power equipment, assembling and exploitation of the high voltage electric powe transmission equipment, assembling and exploitation of the equipment of transmission of electric energy, exploitation of the electronic equipment, ability to work with basic ICT instruments, blacksmith work.

Each field of activities contain a set of competencies (Table 1):

Table 1. Fragment of the fields of activities and set of competencies from the occupational standard of the electro-mechanic of electric equipment (2001). Source: Centre for Development of Qualifications and Vocational Education and Trainin

Fields of activities	Competencies
Assembling of electric equipment	To be able to work safely.
	To execute assembling operations of electric equipment.
	To read electric schemes.
	To measure electric and non-electric parameters.
	To assemble lighting equipment.
Assembling and exploitation of the low-voltage electric power equipment	To assemble and exploit electric power equipment.
	To exploit lighting equipment.
	To assemble and exploit electric gears.

On the basis of competencies there are identified learning goals – elements of competencies containing required knowledge, skills and key skills need to perform in the concrete work tasks. The training goals were described in the integrated way but in the VET curricula these descriptors were being split into categories of knowledge (provided in the theoretical subject-based courses) and practical skills (provided in the practical training at the workshops and during the internships in the companies). Some competencies were dominated by the practical skills, other- by the theoretical knowledge (Table 2).

Table 2. Fragment of competencies and training goals from the occupational standard of the electro-mechanic of electric equipment (2001). Source: Centre for Development of Qualifications and Vocational Education and Training

Competencies	Training goals
To assemble electric equipment.	To know the basics of electric technologies. To know the usage possibilities and related qualities of conductors, dielectrics, semiconductors. To select conductors. To understand importance of insulation in transmitting and usage of electric energy. To assemble cabling and wiring.
To read electric schemes	To join wires and cables. To know conventional markings used in the electric schemes. To draw electric schemes. To design simple schemes of assembling of electric installations and power equipment. To use the schemes in assembling and repair of lighting and power euipment.

VET standard also provided basic guidelines for the assessment of competencies by indicating core criteria for assessment, outlining the methods of assessment of theoretical and practical learning, duration of the final theoretical examination with the range of assessment marks and the topics of tasks. There were also briefly indicated recommendations on the methods of practical examination, the types of tasks and criteria for the assessment. There can be stated, that VET standard introduced the competence approach and competence logic in the planning of curriculum but did not change the separation between the theoretical and practical training and subject–based structure of training in the VET schools.

The occupational standards introduced in the period of 2013-2019 entail different logic of competence-based VET. First of all, the design of these standards is based on the sectoral approach and entails all qualifications typical for the sector of activities. Therefore, design of the occupational standard of the sector implicitly establishes a kind of sectoral qualifications framework, because simultaneous design and development of all qualifications in the sector permits to establish clear relationships and progress pathways between the different qualifications by referencing them to the Lithuanian Qualifications Framework and EQF. Occupational standard provides the list of all qualifications of the sector and the descriptors of every qualification (Table 3).

Table 3. List of qualifications identified in the occupational standard of the production of electric equipment, computers, electronics and optical equipment. Source: Centre for Development of Qualifications and Vocational Education and Training

Title of qualification	Level of the Lithuanian Qualifications Framework	Level of the EQF
Assembler of the electric and automatic panels of command.	III	III
Assembler of the electric equipment.	III	III
Assembler of the optic equipment.	III	III
Mechatronic of automated systems.	IV	IV
Operator of automated assembling line.	IV	IV
Fitter/adjuster of the electronic equipment.	IV	IV
Assembler of the electronic equipment.	IV	IV
Electrician of production equipment.	IV	IV
Mechatronic of automated systems	V	V
Technician of the production of electronic equipment.	V	V
Technician of the production of electric equipment.	V	V
Engineer of electronics.	VI	VI
Engineer-technologist of electronics.	VI	VI
Technician of electronic equipment.	VI	VI
Electric engineer	VI	VI
Technologist of the production of electric equipment.	VI	VI
Engineer of electronics.	VII	VII
Engineer-technologist of electronics	VII	VII
Engineer of electrics.	VII	VII

The descriptor of qualification starts with the basic information about the related activity, workplace, working conditions and employment possibilities. Then there are described units of qualification, which correspond to the core work processes typical for the occupation, split into competencies corresponding to the core work tasks. The units of qualification are of 2 categories: basic units enabling performance of the core work tasks of occupation and the

units of specialization indicating possible specializations in the activity. There is indicated level of qualification referenced to the LTQF – both for whole qualification and for each unit of qualification. This is important for the design of the modular VET curricula, because unit of qualification serves as a basis for the module. Competencies are described in the holistic way by not distinguishing separate categories of knowledge, skills and key skills (Table 4).

Table 4. Fragment from the descriptor of qualification - fitter of electric equipment, LTQF level 3. Source: Centre for Development of Qualifications and Vocational Education and Training

Definition of qualification	Object of activity: assembly of electrical equipment. Typical work equipment: diagrams, drawings, hand, pneumatic and electric tools and measuring equipment, soldering equipment, electric shock protection equipment. Typical working conditions: work on production premises, construction or production sites. Additional information: Qualified persons will be able to work in electrical equipment manufacturing companies.	
Core units of qualification (referenced to the LTQF)	**Competencies**	**Limits of competencies**
1. Assembly of low voltage electrical equipment (LTQF 3)	1.1. To assemble electrical components.	Basics of electrical engineering and electronics. Electrotechnical materials. Reading the basic, functional and installation diagrams. Reading technical drawings. Assembly of control, automation and security, switching apparatus. Selection of mounting cables. Wiring according to the scheme, insulation. Use of soldering equipment. Assembly of protective earthing components for electrical equipment.
	1.2. To assemble electrical part for technological equipment.	Sensors, actuators. Assembly of electrical equipment for automatic machines, robots, manipulators, machine tools.
	1.3. To assemble electric lighting, heating, refrigeration equipment and household appliances.	Application of connection schemes for incandescent, fluorescent, halogen, high-pressure mercury, metal halides, low-pressure sodium, LED lamps. Assembly of electricity metering equipment. Assembly of electric heating, conditioning, recuperation, refrigeration equipment and components.
	1.4. To assemble electric equipment of the cars.	Assembly of automotive electrical components. Dismantling and assembly of car electrical equipment, installation of electrical part of car gas power supply equipment. Installation of additional electrical equipment. Assembly of electric charging stations for electric vehicles. Assembly of electric components for electric vehicles. Installation of electric motor, converter, main battery controller in electric car.
	1.5. Measure electrical indicators in collected electrical equipment.	Measured quantities. Measuring instruments. Determination of measuring limits of instruments. Measurements of voltage, current, power, electricity consumption, resistance, temperature. Insulation, transient, earth resistance measurements. Assessment of deviations from permissible limits. Defect elimination.
2. Assembly of electricity	2.1. To assemble electrical equipment	

generation, supply and transmission equipment (LTQF 3)	for electricity generation.	
	2.2. To assemble electricity distribution equipment.	
	2.3. To assemble relay protection and automation devices.	
	2.4. To measure electrical parameters in assembled electrical equipment.	
3. Assembly of electrical equipment for renewable energy systems (LTQF 3)	3.1. To assemble solar photovoltaic power plant equipment.	
	3.2. To assemble solar thermal collector systems.	
4. Assembly of electrical equipment for solar thermal and geothermal installations (LTQF 3)	4.1. To assemble wind and hydroelectric equipment.	
	4.2. To assemble electrical equipment for biomass boiler plants.	
	4.3. To assemble electrical equipment for thermal pumps.	
	4.4. To measure electrical parameters in assembled electrical equipment.	
5. Assembly of electrical machines and gears (LTQF3)	5.1. To assemble synchronous and asynchronous electric motors and generators.	
	5.2. To assemble stepper gears and servomotors.	
	5.3. To assemble control and protection equipment for electrical machinery.	
	5.4. To assemble electric machine drives.	
	5.5. To measure electrical parameters in assembled electrical equipment.	

Occupational standard also defines the formal requirements for obtaining a qualification or it's part (unit): requirements for education, qualification, professional experience. It also defines

the general requirements for the assessment of competencies and referencing of qualification to the EU and other international standards.

Occupational standards serve as a basis for designing of the national modular curricula which provide detailed specifications of competencies and learning outcomes in the each module, describe key topics of learning and define the module level assessment criteria. National modular curriculum starts with an introductory module, providing general guidance knowledge about occupation and qualification, core modules, which are developed on the basis of the core units of qualification and the modules of specialization defined on the basis of the specialization units of qualifications. The whole training programme leading to vocational qualification requires to study all obligatory modules and part of the modules of specialization in the specified order: beginning with the introductory module, following with the core and specialization modules providing vocational competencies and ending with the concluding module, which is focused on the issues of employability. Core and specialization modules involve both theoretical and practical training, as well as include acquisition of key competencies in the context of activity. In case the students go only for separate modules, they receive certification of the completion of module which can make the integral part of whole qualification acquired at the latter stage (portfolio principle).

Example: modular VET curriculum of electrician (level 4 LTQF/EQF).
Introductory module (1 credit)

Competence: to be acquainted with professional activity

Learning outcomes:

- To describe the occupation of an electrician and the opportunities it provides in the labor market.

- To understand the work processes, functions and tasks of an electrician.

- To demonstrate existing, non-formal and / or informal skills inherent in electrician qualification (if possessed).

General modules (4 credits):

Competence: to act safely in the extreme situations

Learning outcomes:

- To understand the types of emergencies, potential hazards.

- To understand the requirements and instructions for safe behavior in emergency situations, audible civil safety signals.

Competence: to regulate own physical activity.

Learning outcomes:

- To understand the forms of physical activity.

- To demonstrate personal physical activity.

- To apply forms of physical activity, taking into account the specifics of work.

Competence: to protect health and work safely.

Learning outcomes: to understand the safety and health requirements of the workplace.

Modules for the acquisition of the vocational competencies defined by the descriptor of qualification in the occupational standard (on the basis of the unit of qualification).

Obligatory modules (45 credits)

Module: General electrical and electronic work, installation and operation of low current equipment (10 credits)

Competence: To perform general electrical and electronic work.

Learning outcomes:

- To apply the laws of electric technologies in practice.

- To describe electronic devices and their purpose in electrical equipment.

- To describe the electrotechnical materials when installing electrical equipment.

- To read and draw the basic, functional and installation diagrams.

- To evaluate measurements of electrotechnical parameters in electrical equipment.

- To apply the requirements of the Safety Regulations for the Operation of Electrical Equipment when working on electrical equipment.

Competence: Installing and operation of low current (communication, fire and security alarm) equipment.

Learning outcomes:

- To examine low current device diagrams.

- To perform installation and operation of low current devices.

Module: Operation of electrical equipment (20 credits)

Competence: To install and operate electrical equipment.

Learning outcomes:

- To understand the design, operation and installation of asynchronous and synchronous electric motors.

- To understand the types, constructions, operation and basic wiring diagrams of single-phase electric motors.

- To know the construction, operation, use, excitation, speed control methods of DC machines.

- Knowledge of AC and DC motor control and protection devices and their installation.

- To understand the structure, operation, installation and operation of transformators.

- Knowledge of control and protection of non-automated and automated electrical machines.

Module: Installation and operation of low voltage up to 1000 V lighting and power equipment installation, installation and operation of connection lines and electricity metering equipment (5 credits)

Competence: To install and operate the installation of low voltage lighting and power electrical equipment up to 1000 V.

Learning outcomes:

- To understand the requirements for the installation of leads and introductory accounting cabinets.
- To understand and apply the general requirements for lighting systems, networks, their control and protection, switching and protection apparatus for lighting equipment.
- To understand the conditions for the selection of wires and cables.
- To understand the types, structure, installation and operation of electrical installations.
- To understand the requirements for earthing and surge protection of electrical equipment.
- To examine the installation of lighting electrical equipment, installation and operation of switching, protection and control apparatus.

Competence: To install and operate connection lines (leads, input cabinets) and electricity metering equipment.

Learning ouctomes:

- To know the location and installation of the introductory accounting cabinet and the introductory accounting switchboard.
- To understand the construction of leads to IAC and IASS cables.
- To know the technical requirements of electricity meters and their installation in the IACS and IACS.
- To know the operation of connection lines, IPS and IGS.

Module: Installation and operation of electrical equipment of distribution network 0.4–35 kV and transmission network 110–400 kV (10 credits)

Competence: To install and operate electrical equipment of 0.4-35 kV voltage in the distribution network and 110-400 kV in the transmission network.

Learning outcomes:

- To understand the selection of high voltage cable in cable lines and cable line installation requirements.
- To know the overhead and overhead cable line installation requirements, cable selection in cable lines.
- To know the requirements for the installation of switchgear and transformer substations.
- To know the requirements for 0.4-400 kV network, protection and control equipment, grounding and surge protection installation.
- To know the requirements of work safety and electrical safety when installing and operating 0.4–400 kV electrical equipment.
- To know the operation of 0.4-400 kV overhead lines and overhead cable lines.
- To know the basic requirements for the operation of electrical equipment in switchyards and substations.

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- To perform 0.4–400 kV voltage overhead line and overhead cable line installation technology.

- To perform 0.4, 400 kV voltage overhead line, overhead cable line and cable line operation works.

- To perform installation works of 0.4–400 kV voltage transformer substation electrical equipment.

- To perform installation works of 0.4 - 35–110 kV voltage switchgear.

- To perform operation works of 0.4–400 kV voltage substations.

- Perform operation works from 0–4 to 35 kV voltage switchyards.

Optional modules (one module for 5 credits):

Module: Installation and operation of relay protection and automation devices (5 credits)

Competence: To install and operate relay protection and automation devices.

Learning outcomes:

- To read the schematic diagrams of relay protection and automation and install devices.

- To understand the classification of automation elements and relays according to controlled parameters.

- To understand the purpose and use of control and protection relays in low voltage equipment.

- To understand the purpose and use of relay protection and automation in high voltage electrical network.

- To know the operation of relay protection and automation.

- To customize programmable logic controllers.

- To know the operation of electronic equipment.

- To examine the installation and operation of relay protection and automation devices.

Module: Installation and operation of cable lines and cable couplings up to 42 kV (5 credits)

Competence: To install and operate cable lines and cable couplings up to 42 kV.

Learning outcomes:

- To describe the structure, marking, selection of 0.4 - 42 kV voltage cables.

- To understand cable selection for cable lines and their construction technology.

- To understand the operation of cable lines.

- To know the installation of cable glands.

Module: Installation and operation of electrical equipment for consumers (enterprises) up to 10 kV (5 credits)

Competence: To install and operate electrical equipment for consumers (companies) up to 10 kV.

Learning outcomes:

- To know the installation and operation of consumer (company) installations.

- To understand the requirements for the installation and operation of consumer (enterprise) power equipment.

- To apply the know-how of the installation and operation of introductory accounting cabinets, switching, security control apparatus and accounting devices.

- To know the requirements for installation and operation of earthing devices and surge and lightning protection.

- To select wires, cables and laying technologies.

- To know the peculiarities of installation and operation of switching, protection and control apparatus for lighting and power electrical equipment.

Module: Installation and operation of KNX / EIB smart building management system (5 credits)

Competence: To install KNX / EIB smart building management system.

Learning outcomes:

- To describe the purpose and application possibilities of the KNX / EIB smart building management system.

- To explain the general principles for the development of a KNX / EIB smart building management system project.

- To find and fix minor bugs in KNX / EIB's smart building management system.

- To read simple KNX / EIB smart building management system installation principle and installation diagrams.

- To select the elements of the KNX / EIB smart building management system according to the principle and installation scheme and combine them.

- To design and implement the KNX / EIB KNX / EIB smart building management system installation project with the help of ETS software.

Module: Installation of solar photovoltaic power plant equipment (5 credits)

Competence: To iInstall solar photovoltaic power plant equipment.

Learning outcomes:

- To understand the methods and principles, possibilities and limitations of using sunlight energy to generate electricity. Understand solar electricity generation technologies, their types, operating principles.

- To plan and prepare to perform technological processes of installation of solar module equipment.

- To select and prepare the materials required for the installation of solar photovoltaic modules.

- To prepare the tools and equipment required for the installation of solar photovoltaic modules.

- To identify hazards to the safety and health of workers during the installation of solar photovoltaic modules.

- Learn the requirements for safe high-altitude work, read technology projects, technology cards, accounts-permits.

- Learn to use promotion tools, work safely from them.

- To be able to use personal and collective fall protection equipment.

- To safely perform installation work on solar photovoltaic module devices, in accordance with the employee's safety and health instructions.

- To install solar photovoltaic module units.

- To carry out a quality check of the installation work of solar photovoltaic modules.

- To install and dismantle scaffolding.

- To use mountaineering equipment.

- To work safely on high-altitude jobs.

Module: Installation of wind power plants (5 credits)

Competence: To install wind power plants.

Learning outcomes:

- To understand the laws and principles of wind energy use, the essence of wind energy use technologies for energy production, operating principles, possibilities and limitations of wind energy installations, types and operating principles.

- To plan and prepare for the technological processes of installation of wind energy equipment.

- To select the materials and constructions required for the installation of wind energy equipment.

- To prepare the tools and equipment necessary for the installation of wind energy equipment.

- To identify hazards to the safety and health of workers during the installation of wind energy equipment.

- To carry out the installation of wind energy equipment safely, in accordance with the safety and health instructions of the employee.

- To install wind power equipment.

- To perform quality installation work on wind energy equipment.

The programme is concluded with the concluding module "Introduction to the labour market" (5 credits) dedicated to the employment opportunities and employability competencies.

The modular curriculum also provides guidelines on the sequence of modules for the initial and continuing VET courses.

There can be noticed that the structure and content of the modules strictly follow the holistic approach to the competence requirements of the work process defined by the occupational standards. As the massive implementation of these curricula started in 2019, the VET providers face different challenges of implementation. The research conducted by Lina Vaitkutė, PhD student of Verona University and Vytautas Magnus University disclosed, that the transition from the subject-based to modularised competence-based training practices

creates conceptual and methodical challenges, such as difficulties in integrating theoretical knowledge and practical skills, or vocational and general education knowledge (Tūtlys, Vaitkutė forthcoming). There is still present the institutional separation of the theoretical and practical training in the VET schools, defined by weak development of the work-based learning and apprenticeships. VET teachers, who previously were the masters of their subjects, tend to lack the know-how and experience of the cooperation and partnership in the modules, especially when it requires integration of the theoretical study and practical work. Besides, the bureaucratic standardized regulation of VET curricula tend to restrict the flexibility in the implementation of integration of vocational knowledge and practical skills in teaching practice (Tūtlys, Vaitkutė forthcoming). Modularization also strengthened the orientation of the VET providers to the concrete skills needs of the enterprises but in the same time it tends to reduce the attention to what Muller and Young (2019) call "powerful knowledge".

Chapter 3: Relationship of IVET at upper secondary levels with that at higher levels

Looking historically the level 5 provision of VET in Lithuania experienced important iterations in the last 30 years. During the Soviet period there were operating so called techikums which provided higher vocational qualifications (technicians, accountants, service specialists etc.). They provided training according to special secondary education programs. The duration of training was 3.5 - 4 years, and those entering after secondary school studied for a year shorter than those entering after basic school. The diplomas of technikum graduates certified acquired special secondary education and the provided professional qualification (technician, technologist, etc.), sufficient to work not only in technical work, but also to manage other employees. In 1991 government of the Republic of Lithuania liquidated technikums (as well as all other special secondary schools in the field of pedagogy, trade, medicine, culture, music) and on their basis established higher vocational schools, which accepted graduates of general secondary education and provided different vocational qualifications. In 2000 the higher vocational shools underwent another transformation related to introduction of the binary higher education system, when, after the selection and quality control process part of them were transformed into the universities of applied science (kolegija) and the remaining became ordinary VET schools. This moment marks disruption of the provision of "level 5 " qualifications in Lithuania and since this moment no level 5 qualifications have been provided. The universities of applied sciences provided the higher education degrees of professional bachelor, which later were referenced to the LTQF/EQF level 6. These institutions also initiated the "compensatory" courses for the graduates of technikums and higher vocational schools aiming to help them in acquiring the higher education (professional bachelor degree) and to continue their studies in the universities.

The discussion about the provision of the level 5 qualifications re-emerged in 2008, when there was initiated design of the National Qualifications Framework and the reform on the National System of Qualifications. The discussions which accompanied these reforms included the claims and statements of some employers and their organizations claiming the need of these qualifications for the different sectors of economy. This expressed demand and

presence of the holders of the qualifications of technikums and higher vocational schools in the labour market were the main reasons for including level 5 in the Lithuanian Qualifications Framework approved by the government in 2010. The initial draft version of the LTQF descriptor of level 5 stated that qualifications of the VET graduates possessing vocational qualification at level 4 and having acquired additional skills and competencies via continuing vocational training and experiential learning can be referenced to the level 5.

Design and implementation of the level 5 qualifications started with the development of the occupational standards in 2013. The groups of experts and stakeholders in the different sectors of economy were involved in the process of design of the occupational standards. They identified and designed 87 level 5 qualifications in the different sectors of economy (Table 5).

Table 5.   Level 5 qualifications in the occupational standards of Lithuania. Source: Kvalifikacijų ir profesinio mokymo plėtros centras

Occupational standard (sector of economy)	Level 5 qualifications
Hospitality and catering services	confectionery producer, administrator of hospitality services, administrator of catering services, chief cook
Environment protection and supply of water	technician of water supply processes technician of equipment of the biomass icineration operator of laboratory of chemical analysis of the environment pollution
Production of the electric equipment, computers, electronic and optical products	mechatronic of the automated systems supervisor of production of electronic products supervisor of production of electric equipment
ICT	database administrator software designer system administrator testing specialist network engineer designer of user interface
Machinery production, transport means manufacturing, technical maintenance and repair	production quality technician production technician-coordinator mechatronic operator of metalworking machines transport means repair technician technician of repair of the engines of internal combustion
Woodworking and production of furniture, paper and paper products	foreman/supervisor of the woodworking and furniture production
Printing, mass-media and publicity industry	designer of printing mechanic of printing master-foremen of printing photographer technician of video and audio systems
Retail trade	salesperson consultant
Healthcare and beauty services	master hairdresser

Occupational standard (sector of economy)	Level 5 qualifications
Construction	finishing installer master master of environment ordering concreter master carpenter master painter master facade insulation master railroad master builder road builder master construction installation master furnace building master mason master scaffolding installer master tiler master plumber master tinsmith master roofer master heating, ventilation, air conditioning system installer master plasterer master pipeline fitter master
Education and libraries	tutor of work-based training VET teacher assistant adult educator teacher of non-formal training teacher assistant librarian
Textile, clothing and leather products manufacturing	weaving master knitting master master of nonwovens production weaving master spinning master tailor master master of embroidery production master of leather goods production
Tourism, sport and leisure industry	travel service manager sport instructor specialist of sport activity
Visual arts and production of artistic products	animator ballet dancer performer of contemporary dance
Public administration	soldier customs officer specialist of public security
Production of welded and soldered products and constructions	master of contact welding master of mechanized, orbital and robotic welding welding inspector master of welding, cutting and laser surface treatment welding master welder master

Occupational standard (sector of economy)	Level 5 qualifications
Agriculture, fishery, veterinary services and food industry	technologist of agriculture forestry worker operator of the equipment in food industry
Transport, logistics and warehousing	coordinator of the railway transport aircraft avionic aircraft mechanic

Introduction of these qualifications in the VET system is only at the initial stage of experimentation. There have been launched several national and international projects in this field.

In the framework of the ESF funded project "Development of the Lithuanian Qualifications System (Phase I)" (code No. 09.4.1-ESFA-V-734-01-0001) there is implemented a project of experimenting the V qualification level vocational training program in the field of continuing training. Period: 2016-2021. There have been designed and tested 6 level 5 curricula with the volume of 50 credits:

- modular vocational training program for a master fitter,
- modular vocational training program for facade insulation master,
- masonry master modular vocational training program,
- roofing master modular vocational training program,
- welding master modular vocational training program,
- modular vocational training program for vehicle repair technicians.

These training programmes are focused on practical activities, their content is based on real labour market needs. Upon completion of these modular programs V qualification level category is acquired, becoming a specialist who is able to perform high quality construction, welding and vehicle repair works, manage the performance of these works, is able to work in a team, independently perform work which requires high personal responsibility.

In 2019 the Ministry of Education, Science and Sports initiated the amendments of the descriptors of the LTQF by stressing that the degrees and qualifications provided by the short cycle studies are referenced to the level 5. Currently there is a moment of rather intensive discussions between the Ministries, sectoral professional committees, VET providers, universities of applied sciences and social partners about the implementation of the qualifications of the level 5 and "division" of this level amongst the vocational qualifications provided by the VET establishments and short cycle degrees provided by the universities of applied sciences. Out of these discussions there could be distinguished several possible pathways of the provision of the level 5 qualifications:

1. Vocational qualifications provided on the basis of modular VET curricula by the VET centres. This pathway would be accessible for the VET graduates possessing level 4 vocational qualification and some work experience, the lengths of which could be different depending on the sector. This pathway is strongly promoted by the stakeholders from the sectors of manufacturing and construction, claiming the increasing demand of such specialists, especially technicians and

masters/foremen/supervisors of production and construction processes, as well as tutors of work-based learning for the development of apprenticeship.

2. Short-cycle degrees and qualifications provided by the universities of applied sciences. This pathway would be accessible for the graduates of general secondary education and VET (having secondary education). The implementation of this pathway is not sufficiently clear and still very much in progress. It is foreseen, that holders of the short cycle would have the possibility of easy access to shorter study programmes of the professional bachelor degree (permeability mechanisms). This pathway is the best suitable for the sectors, where studying or training for level 5 qualifications do not require to have work experience as access requirement (e.g. ICT, public administration, tourism, sports and leisure services, etc.). There is still discussion whether the dropouts from the undergraduate studies of higher education could opt for the recognition of level 5 qualification, with very strong opposition for opening this option from the side of employers and their organisations.

3. Mixed approach in provision of the level 5 qualifications on the basis of consortia between the VET providers and the universities of the applied sciences. This idea is now being tested in several projects and is based on the idea of complementarity of VET providers and universities of applied sciences in providing the learning outcomes: VET providers can take care in providing vocational skills, especially relevant technological practical skills by using sector practical training centers, while the universities of applied sciences could provide the modules related to academic and applied knowledge (eg. management, entrepreneurship, applied psychology, etc.).

Chapter 4. The changing relationship between IVET and CVET

Since the beginning of the VET policy refom in the last decade of the XXth century the public provision of continuing vocational training was strongly targetted to help unemployed and job seekers. The purpose of continuing VET (CVT) has been to improve an individual's skills, to obtain another qualification or to obtain the competencies required to perform a statutory job or function. Formal CVT programmes were aimed at individuals from all levels of education, from primary to post-secondary education. Learners could be required to have practical experience or the necessary qualifications. The duration of such training programs is up to 1 year, upon completion of which there are provided state-recognized qualifications (EQF levels 1-3). In the period from 1995 to about 2006 the general esteem of CVT was strongly influenced by the employment policy. The main CVT providers were so called "labour market training centres" ("darbo rinkos mokymo centrai") belonging to the "Labour Market Training Service" (Darbo rinkos mokymo tarnyba) under the Ministry of the Social Affairs and Labour with the mission to provide public services of training for unemployed /job seekers and to facilitate their employment and employability. These training centres also provided a wide range of continuing vocational training services for enterprises (short-term training of the workers aimed to equip them with the certificates needed for the execution of work functions or to adjust their skills and competences to the changing workplace requirements). The private provision of the CVT was comparatively undeveloped and concentrated in specific fields (e.g., provision of ICT

skills, CVT in the field of welding). The investment of employers in the continuing vocational education and training of employees was low (with the exception of companies of foreign capital). For these reasons the public esteem of the CVT in this period was dominated by the image, that CVT is applied for the labour market integration of unemployed and provision/acquisition of the skills that are necessary to perform in the concrete workplaces. The understanding that the vocational education and training ends at the moment of graduation of educational institution and subsequent employment was also very widespread amongst employers, employees, learners and other groups. For the first two decades after the restitution of independence the provision of initial and continuing VET was separated by delegating this provision to the different providers (VET schools and centres provided initial VET, whereas labour market training centres coordinated by the Labour Market Training Service were delegated the function of employment training). Initial VET provision was governed by the Ministry of Education and Science, whereas continuing VET (employment training) – by the Ministry of Social Security and Labour. Since 2009 there were launched institutional reforms of the continuing training of unemployed aimed to integrate the sub-systems of the labour market vocational training with the public provision of the initial VET with the aim to strengthen the overall VET provision and to optimise the investments in the development of the VET infrastructure. As a result, a part of labour market training centres was integrated with the initial VET centres. The private provision of the CVT was also increasing, as well as the investment of the enterprises in the CVT of the employees.

Continuing vocational education and training in Lithuania has been treated by the VET policy as vocational education and training which takes place after the acquisition of the first vocational or professional qualification. Continuing vocational education and training targets to the professional development, adjustment of skills and competences or re-qualification (acquisition of the new vocational or professional qualification) (Explanatory dictionary of qualification system terms, 2008). The main difference of the continuing vocational education from the adult education, further education and training is the provision of vocational or professional competence and qualification as a result of the training. Since the accession to the EU the continuing vocational education and training started to be considered as a part of lifelong learning situated in the vocational/professional field. Training for the unemployed and for those who have been notified of dismissal has been organised via formal CVT programmes listed in the 'study, training programmes and qualifications register'. The local public employment service (PES, teritorinės darbo biržos) has been responsible for training the unemployed. In 2012, a new procedure approved by the Ministry of Social Security and Labour for training the unemployed came into force. The unemployed and those notified of dismissal are referred to training providers, which they have chosen from the list published on the website of the Public Employment Service. Training programmes are organised taking into account the specific needs of employers. These programmes are offered in VET institutions and other institutions licensed to provide them. Most unemployed persons follow programmes agreed with employers, who are obliged to hire the unemployed persons for a period of at least 6 months after training. Where it is agreed with the employer, practical training is organised at the workplace.

Slow increase of the continuing vocational training provided by the enterprises in the last years can be explained by the increasing shortage of skilled workforce in many sectors of economy, especially in the industry (Tables 6 and 7).

Table 6: Lifelong learning rate (of the population aged 25–64) 2013-2017 Source: Statistics Lithuania

		Lifelong learning rate (of the population aged 25–64) | per cent					
		2013	2014	2015	2016	2017	2020
Males and females	Urban and rural areas	5.9	5.1	5.8	6	5.9	7.2
	Urban areas	7.1	6.4	7.1	7	7.1	8.2
	Rural areas	3.1	2.4	3	3.7	3.4	4.9
Males	Urban and rural areas	5.2	4.6	5.1	5.1	4.4	5.6
	Urban areas	6.7	6.1	6.6	6.3	5.6	6.9
	Rural areas	2.3	1.9	2.2	2.9	2.3	3.1
Females	Urban and rural areas	6.5	5.6	6.5	6.8	7.3	8.7
	Urban areas	7.5	6.6	7.5	7.6	8.4	9.5
	Rural areas	3.9	3	4	4.7	4.6	7.0

Table 7: Investment of companies in the continuing vocational training 2010-2015 Source: Statistics Lithuania

	2010	2015
Working time spent in vocational training courses | h	34	19
Employed persons participating in vocational training courses | per cent	18.6	25.6
Enterprises organising continuing vocational training | per cent	51.9	61.6
Expenditure of enterprises on vocational training courses | EUR	252	261

This factor will also influence the increasing trends of apprenticeship in the initial VET as well as increasing provision of the continuing vocational training in enterprises in the near future. Demographic development trends with decreasing population and growing emigration

in the period after the global economic crisis pushes the enterprises to increase the share of work-based training provision in order to solve the sharpening problem of the lack of skilled workforce. Interviews with the representatives of the employers' organisations executed in 2016 disclosed that they expected significant increase of the provision of work-based continuing vocational training and apprenticeship in the enterprises. The access of the VET graduates to continuing vocational education and training programmes in the second decade of the 21st century has been widening due to increasing offer of training measures and providers, as well as due to increasing support of the state and EU funded programmes in the field of CVT. In 2017 there have been registered 201 institutions providing informal vocational education and training according to informal training programmes and 28 of them – initial VET providers. Continuing vocational training and informal vocational training for employees is also provided in implementing the measure „Competence vaucher" coordinated by the Ministry of Economy. In implementing this measure there is prepared the list of training providers and programmes which currently includes 30 initial VET providers. The accessibility of continuing training of employees strongly depends on the existing funding arrangements, especially on the availability of the EU funding. There were implemented different programmes and projects of continuing vocational training supported by the ESF and state budget. The measure 'Improvement of human resources in enterprises' was executed from the 2007-13 with the human resources development operational programme aimed to improve the qualifications, knowledge and skills of company employees and managers. The measure supported training of employees and managers and organising training at workplaces. In 2008 and 2012 two calls were published by the Ministry of Social Security and Labour and the European Social Fund (ESF) Agency to fund employee training. Altogether 240 projects received support valued at around EUR 78 million, of which EUR 54 26 million was support from the ESF. Companies had to contribute to the projects (small enterprises had to provide 20%, medium enterprises 30% and large enterprises 40% of the total training cost). A similar measure was implemented for public sector employees. Support from the 2014-20 European Structural Funds has been allocated for several human resources development measures. For example, under a measure for CVT of employees called 'Competence Voucher' EUR 56.8 million have been allocated to fund the training of almost 42 000 employees. The projects are planned to be implemented in 2017-23. The measure called 'Human resources Invest LT' aimed to support training of employees of foreign companies operating in Lithuania. A total of EUR 11.6 million were allocated from European Structural Funds to fund the measure; 49 projects have already started in 2016 and will last to 2023. Companies had to contribute funding for both measures (small enterprises will have to provide 30%, medium enterprises 40% and large enterprises 50% of the total training cost). Training costs for the unemployed were mainly covered from ESF support.

Starting in 2012 a voucher system was introduced by the Ministry of Social Security and Labour to fund training of job seekers. A training voucher is a document issued by the public employment service (PES) to an unemployed person. The local PES commits to paying a selected provider − within the limits of the voucher value − for training services under an agreed VET programme. The unemployed person can choose training providers from the list published on the PES website. After training, the unemployed person undertakes to work in the position offered by the local PES for at least six months or start own business. In case of a tripartite

contract (between the unemployed person, local PES and employer), a training programme and its provider are agreed with the employer. The employer undertakes to employ the unemployed person for at least six months. If the actual costs of training exceed the limits established by the government, the difference is covered by the learner or employer. The same procedure is applied to training persons notified of dismissal.

Recently there have been introduced some significant changes in the institutional provision of the CVT for unemployed, as well as in the curriculum design of this kind of CVT. The amendment of the Law on VET introduced in 2019 (https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/b0b6cda0eb0a11e7a5cea258c39305f6) stipulates (Article 2.23) that the continuing vocational training is VET aimed at improving a person's existing qualification or acquiring another qualification or competencies defined by the occupational standard. The new Law also makes it clear that the CVET is not intended for the acquisition of a first qualification (Article 7.1), so it is intended for persons who already have a professional qualification at any level or a higher education qualification at any level. With the full entry into force of the new Law on 1 January 2019, the formal CVET can only be carried out by providing specially designed CVET programs (228 such programs are currently in place, https://www.aikos.smm.lt/Registrai/SitePages/Studijų%20ir%20mokymo%20programos.aspx ?ss=4cd443a2-76dc-4c59-a557-f6df89f696fc). These training programmes are accessible for the registered job seekers (funded by the state), for the individuals seeking to enrol on the voluntary basis (funding by the applicant if he/she already possess 2 or more qualifications of further education – VET and/or HE), for the employees of enterprises (usually funded by the enterprises). Adults in Lithuania can also be taught according to state-regulated non-formal vocational training programs (these usually consist of one or more modules of the formal VET program) or non-state-regulated non-formal adult education programs. Following the amendment of the Law, a new description of the procedure for the preparation and registration of VET programmes (https://www.e-tar.lt/portal/lt/legalAct/9a25b870ee3911e88568e724760eeafa/asr) was prepared and approved by the Minister of Education and Science of the Republic of Lithuania on 22 November 2018. In the implementation of the formal VET program in CVET and the non-formal VET program, 18 academic hours of 1 study credit are allocated for contact work, counselling and assessment of student learning achievements, and 9 academic hours for student-independent study not supervised by a teacher. The third chapter of this description states that CVET must include modules for the acquisition of competences and a final module, while general modules for the development of work safety competencies in emergency situations and the safety and health of workers must be integrated into the content of the modules for the acquisition of competences.

In 2018 the former Lithuanian Labour Exchange (specialized in training the unemployed) was reorganized into Employment Services Under the Ministry of Social Security and Labour of the Republic of Lithuania (https://uzt.lt/en/). The optimization of the institution's management processes and the redistribution of human resources have increased the number of professionals serving jobseekers and employers.

Chapter 5. Changing institutional arrangements

The provision of the IVET in Lihuania in the last decade of the 20th century involved provision of the following types of VET (ETF 2002; Dienys, Pusvaškis 1998; Laužackas 2005) :

1) basic vocational education (ISCED97 Level 2) comprising the programmes for drop-outs from basic general education school with the duration of the studies for 2-3 years (2 level of professional qualification).

2) secondary vocational education (ISCED97 Level 3) with entrance requirement - completed basic education, minimum age of enrolment 14 years, an comprising the following 2 types of programmes:

- stage II programmes. Professional qualification of the level 3 was awarded.
- stage III programmes. Professional qualification of the level 3 and maturity certificate (general secondary education) was awarded.

3) post-secondary vocational education with two types of training programmes:

- stage 4 vocational programmes awarding vocational qualification of the 3 level after the studies of 1-2 years,
- vocational qualification of the 4 level and education intermediate between secondary and higher education after the studies of 2-4 years (this kind of qualification was provided by the higher vocational schools established on the basis of the former Soviet technikums in 1991and transformed into the universities of applied sciences in 2000).

In 1997 by the order of the Minister of Education 5 vocational education levels were introduced in Lithuania (Table 8).

Table 8. Levels of vocational education in Lithuania in 1997. Sources: Laužackas 2005; ETF 2002

Level of vocational education	Description of the level of vocational education	Level of general education	Duration of programme
Level 1	Ability to carry out simple, routine work operations not requiring autonomous decisions	No special requirements	Up to 1 year
Level 2	Ability to perform specialized work not requiring important autonomous decisions	Primary/ basic	1 to 2 years
Level 3	Ability to perform fairly complicated work in areas requiring responsible and independent decisions	Basic/secondary	2 to 4 years
Level 4	Ability to perform complicated work requiring personal responsibility in specific areas of activity. Leads to ability to carry out planning, organizational, administrative, and control functions independently	Advanced VET school	3 years
Level 5	Ability to perform complicated creative work in broad, new areas of activity; ability to engage in autonomous vocational activity based on thorough knowledge. Leads to ability to plan and assess the work of others and to assume managerial functions	Non-university higher	4 to 5 years

According to official statistics there were 487 institutions of the 3rd and 4th types in 1999. There were significant attempts of optimisation of the VET providers in the end of the 20th century and beginning of the 21st. Since 2000 the reform of the optimisation of the network of VET providers let to the establishment of the regional VET centres on the basis of the unification of the smaller VET schools (Laužackas 2005). In parallel to that the higher schools of vocational education and training were reorganised into the universities of applied sciences and those, which could not meet the quality requirements were transformed into the VET centres. This kind of institutional network has been maintained without major changes until the second decade of the 21st century. The amendment of the VET law in 2007 introduced apprenticeship as alternative institutional pathway of the VET provision, but due to the lack of engagement of social partners and passive attitude to the VET centres to the development of apprenticeship schemes this pathway was not realised.

The Vocational Training Act with it's subsequent amendments (1997, 2007, 2017, 2019) increasingly liberalised the VET provision and favoured higher autonomy of the VET providers. The amendment of 1997 stipulated that a vocational training provider could be any vocational training institution, a freelance teacher or any other provider (general school, company, organization whose main activity is not vocational training). VET providers could accept learners and offer formal VET programs after obtaining a license from the Ministry of Education and Science.

The number of the VET providers in the last decade has slightly reduced (from 76 in 2015 to 71 in 2019-2020) due to the ongoing mergers of some VET centres in the period of 2018-2019 (Table 9).

Table 9. The number of VET providers in 2015-2020. Source: Statistics Lithuania

	Number of vocational training institutions	units			
	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Republic of Lithuania	76	74	76	73	71
Vilnius county	20	21	22	22	22
Alytus county	7	7	7	5	4
Kaunas county	14	13	13	13	13
Klaipėda county	11	10	10	9	9
Marijampolė county	1	1	1	1	1
Panevėžys county	7	6	6	6	6
Šiauliai county	6	6	7	7	6
Tauragė county	2	2	2	2	2
Telšiai county	3	3	3	3	3
Utena county	5	5	5	5	4

The number of students in the VET institutions significantly declined in the all categories of possessed education (Tables 10 and 11).

Table 10: Distribution of learners in VET and HE establishments 1990-2017 Source: Statistics Lithuania

Years	Students in VET, thous.	Admitted students in VET, thous.	VET graduates thous.	Students in higher vocational schools and colleges thous.	Admitted students in higher vocational schools and colleges, thous.	Graduates of colleges, thous.	Students in universities, thous.	Admitted students in universities, thous.	Graduates of universities, thous.
1990	47.4	21.2	23.2	46.4	11.5	14.95	67.3	9.8	9.47
1995	49.2	19.4	12.3	24.2	8.8	6.76	54.0	19.2	12.37
1999	52	15.5	14.6	38.4	10.3	6.97	84.3	23.7	14.89
2004	46.3	21.0	12.6	52.2	23.9	8.8	138.5	42.7	24.01
2010	49.5	22.2	13.9	53.3	15.96	12.67	133.56	33.39	32.33
2015	46.5	23.7	15.3	39.77	13.26	8.89	93.52	27.06	22.58
2017	42.1	19.9	16.1	35.43	11.99	8.31	82.34	22.7	19.32
2019-2020	27.8	12.9	12.1	32.93	10.66	7.438	73.01	21.43	17.36

Table 11. Number of students in the VET institutions. Source: Statistics Lithuania

		Number of students in vocational training institutions | persons					
		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Change between 2015-2020
Males and females	Total by study programmes	46543	47661	42101	34152	27824	-18719 (-40,21 %)
	Students having no lower secondary education	5321	5519	5160	4975	2418	-2903 (-54,55%)
	Students having lower secondary education	20540	20133	18398	16583	14781	-5759 (-28,04%)
	Students having upper secondary education	20682	22009	18543	12594	10625	-10057 (-48,63%)

This decline can be explained both by the overall demographic change and the lowering number of enrolled in the educational establishments, high level of youth emigration in the aftermath of the economic crisis and continuing trend of domination of the higher education in the choices of graduates of general education.

Looking to the recent statistical data on the graduates of the VET institutions, there can be noticed several trends: 1) overall decline of the number of graduates during the last decade; 2) the biggest share of graduates is amongst the students having upper secondary education (Table 12).

Table 12. Number of graduates of the VET institutions. Source: Statistics Lithuania

| | | Graduates of vocational training institutions \| persons | | | | | Change between 2015-2019 |
		2015	2016	2017	2018	2019	
Males and females	Total by study programmes	15290	16364	16054	15080	12141	-3149 (20,6%)
	Students having no lower secondary education	1519	1578	3466	2971	1261	-258 (-16,98%)
	Students having lower secondary education	5095	5024	2875	3008	4431	-664 (-13,03%)
	Students having upper secondary education	8676	9762	9713	9101	6449	-2227 (-25,66%)

This trend can be explained both by the increasing demand of VET graduates with secondary education in the labour market (what serves as motivator), as well as by the shorter VET studies for the students who enrol with secondary education.

For the last ten years, the classroom instruction teaching method has dominated in IVET in Lithuania, and moments of practical training in workshops have been integrated into it. Only a few weeks a year students had to do internships in companies (workplace learning), but these activities were not clearly regulated and accurately accounted for, making it difficult to assess how much of the VET programme it actually covered and how much it contributed to the success of the programme. The situation began to change in Lithuania around 2013 with the opening of the first Sectoral Practical Training Centres (42 in total, sectoral practical training centre - a vocational training institution or its subdivision equipped with modern practical training equipment of one or several sectors of the Lithuanian economy, providing IVET and CVET practical training services to all residents of Lithuania seeking to acquire or improve a qualification). As these centres are equipped with modern equipment that is actually used in companies, they have begun to organize much-needed practical learning in workshops as part of the VET program. It can be tentatively stated that since 2015, at least 3/5 of all students of the Lithuanian VET system have spent at least half of the VET program implementation time in such centres. This is because only students from the VET schools (35 out of 70) on whose basis these practical training centres operate traditionally attend these centres. However, from 2020 onwards, the situation is expected to change, as there is sufficient funding for projects

that will allow students from VET schools without such centres to attend sectoral practical training centres.

Since 2015, cases of VET learning in the form of apprenticeships (workplace learning) have been counted in Lithuania but initially they accounted for only less than 2 percent of all learning contracts per year. This also shows the extremely low volume of workplace learning cases at that time. However, the situation is steadily improving - in 2019, these cases accounted about 3 percent (see Vocational Education and Training in Lithuania 2019, Vilnius: STRATA, https://strata.gov.lt/images/tyrimai/2020-metai/svietimo-politika/20200401-vocational-education-and-training-in-lithuania-2019.pdf), and with the clear regulation of the principles of learning in this form and the completion of a special online platform (https://www.pameistryste.lt), a significant increase in apprenticeships is expected in the future after the end of Covid19 pandemics.

The decentralization of vocational training management began with the EU accession with the reorganization of the state into self-administered vocational training institutions (viešoji įstaiga). This change enables various interest groups (companies, social partners, state and local government, etc.) to participate in the governance of VET providers. Their new status also increases their financial independence.

The aftermath of the global economic crisis raised a lot of new challenges for the VET provision starting from the increasing demands of skilled workforce due to emigration and ending with the improvement of the attractiveness and quality of VET provision. Work-based learning and institutional "approaching" of the VET providers to the labour market became clear priorities in the VET policy. Last versions of the Amendment of the Law of Vocational Training in 2017 and in 2019 included provisions to bring VET system closer to the needs of the state's economic development:

1. Change in the management and funding of VET centres enabling to attract more social partners and encourage additional funding.

2. Introduction of the quality assurance system of VET providers by obliging them to implement internal quality assurance systems in order to conduct an annual self-assessment and publish the results of the assessment (an external institutional review must be carried out every five years).

3. Further promotion of apprenticeship (both company-based when all training is provided by the enterprise or other labour market actor and dual apprenticeship with participation of the VET centres).

4. Changing the legal status of the all public VET providers into the self-governed public bodies by engaging social partners in their governance.

The final provisions of the new Law on VET stated that state and municipal vocational training institutions that are not public institutions will be transformed into public institutions by 1 January 2019. On this basis, 42 state VET schools, which previously had the status of a budgetary institution, were transformed into public institutions by the specified date. Thus, now that the activities of VET schools are regulated by the Law on Public Institutions of the Republic of Lithuania, their rights and freedoms and autonomy have significantly expanded compared

to the previous situation. The VET school can now have several stakeholders, one of which is the governmental body or the municipality, and must have a collegial governing body, the Council. The new Law on VET states that it must be composed of nine representatives (Article 17.6): a student representative, a teacher representative, a representative of the municipality in which the school operates and 6 social partners (traditionally representatives of business enterprises in the school environment, delegated by national business associations). It is believed that such a management transformation will significantly improve the quality of services provided by the VET school and increase the publicity and transparency of its activities. On 11 September 2019, the Government of the Republic of Lithuania approved the Methodology for Calculating Vocational Education and Training Funds for One Student Studying According to the Formal Vocational Education and Training Program. A very significant provision of the new methodology is that the funds allocated to VET are not allocated on the basis of program hours (this was the case before the entry into force of the new methodology), but on the basis of credits. Equally important is the provision in the methodology (Item 11) that in cases when a student's formal VET is carried out in the form of apprenticeship training, the VET funds allocated to him / her are increased by 25 percent.

In the same time some processes of VET became more centralized for the sake of effectiveness and matching to the skills needs of the economy. In 2017 for the first time, enrolment in vocational schools was centralized and transferred to the online platform - the online system of the Lithuanian Association of Universities for Joint Admission (LAMA BPO), which was adjusted by including admission to the VET centres. In order to ensure better match of the supply of the VET programmes and labour market needs there were introduced the quotas for admission of VET students based on the skills needs forecasts provided by the National Human Resource Monitoring system.

Referring to the status of the VET providers in terms of division between the provision of VET and general education, there can be concluded, that all public VET centres maintained the combined status of provision of VET and general education throughout above described reforms and institutional changes. For the last few decades, Lithuanian VET institutions have been running three-year VET level IV qualification programs (young people with 10th grade of general education are admitted to these programs), after which a person is issued a certificate of completion of secondary education and a diploma confirming the awarded professional qualification. Several VET institutions also run several Level 3 VET programs, which lead to a diploma certifying the acquisition of the relevant professional qualification. The only significant change in this area is that from September 2020 gymnasium students in general schools will also be able to study in VET schools. After assessing their personal abilities and workload, they can already enter one or more modules of the VET program. By choosing one module at a VET school, a gymnasium student will be able to have 3 to 6 lessons per week, and such learning will last from one to two years. Such a pupil, together with his or her general education school and VET school, will draw up an individual learning plan so that the maximum weekly number of 35 lessons is not exceeded. Both schools will work together to coordinate a student-friendly lesson schedule. This possibility is regulated by the above-mentioned Description of the Formal Vocational Training Procedure, the new version of which was approved by the Minister of Education, Science and Sports of the Republic of Lithuania on 30 May 2020.

6.   Conclusions : pluralisation, academic/vocational drift

When analysing the trends of development of the VET in Lithuania in the last 3 decades, there can be observed different extent and pace of change depending on the dimension.

In the field of the VET curriculum design and development the VET system sustained the integration between VET and general education typical for many school-based VET systems and largely defined by the abrupt institutional changes of the post communist transition when the Soviet "dual" model of VET provision was transformed to school-based VET seeking to meet the skills needs of the emerging market economy. More significant change in the VET curriculum design and a slight separation between the provision of general education and vocational training in the VET system has started to emerge with the implementation of the modularised VET curricula on the basis of the competence-based occupational standards implemented since 2013 and introduced in 2019. However, the further vector of this change and it's implications to the harmosation or diverisification of the balance between academic versus vocational drift are not yet evident. Rather fragmented engagement of economic stakeholders in the VET provision and strong role of the government in shaping the reforms of VET, strong positions of the public VET centres towards delivery of integrated pattern of VET (VET and general education), as well as increasing demand of academic knowledge in some VET programmes (e.g. technological, healthcare and beauty services) would support development of harmonisation scenario. However, in some sectors, like construction, transport, some fields of manufacturing, retail trade there could expected stronger orientation of VET towards vocational drift and stronger separation between the provision of general and vocational education. Modularisation of the VET curriculum permits and supports such development.

What regards the relationships between the IVET and CVET, there should be stressed that these relationships have been strongly influenced by the specific institutional factors of the VET provision. During the first two decades after 1990 the public provision of CVET was dominated by the active labour market policies and directed to employment goals and dealing with the problem of structural unemployment (activities of labour market training centres coordinated by the National Labour Market Training Service), whereas the CVT provided by the employers was very fragmented and minimal. With the implementation of the Lithuanian Qualifications Framework, development of occupational standards and national modular VET curricula the "dualism" between so called "labour market training" and initial VET provision was abolished, because modular VET curricula developed in the basis of occupational standards can be used both for the initial and continuing VET. There can be noticed, that experimentation of work-based learning and apprenticeship is more applied in the training schemes for the unemployed and job seekers.

What regards the provision of level 5 qualifications, there could be distinguished several important changes, starting from the transformation of the Soviet technicums into higher vocational schools in the last decade of the XXth century and their subsequent transformation into the universities of applied sciences and VET centres in 2000, what disrupted the provision of qualifications which we reference to day to the level 5. The "renaissance" of these qualifications was boosted by the approval of the LTQF in 2010 and implementation of the

occupational standards in 2013-2019. Despite that level 5 qualifications have been designed in many sectors of economy, the institutional pathways of their provision are still under discussion between the policy makers, social partners, VET providers and the universities of applied sciences. These discussions show, that most probable scenario of the level 5 provision will combine the initial and continuing VET programmes, apprenticeship and delivery of short cycle studies by the universities of applied sciences.

Finally there can be observed important interdependencies of the changing discourse over the content of VET curricula with the institutional change in the structure of the VET provision and macro-level factors of the political and socio-economic change represented in the Table 13.

Table 13. The links between socio-economic and political change, VET curriculum change and reforms and changing institutional settings of VET provision in Lithuania 1990 - 2020

	Stages of development: change, factors, critical junctures		
SOCIO-ECONOMIC AND POLITICAL CHANGE	1990-2000. Post-communist transformation: re-estblishment of statehood institutions, privatisation, structural unemployment, liberal "catching-up" economic and social policies, weak "liberal" engagement of social partners in VET.	2001-2008. Pre-accession and access to the EU: acquis communautaire, pre-accession reforms, implementation of the EU policy agenda in the skill formation, emigration and skill shortages.	2009- 2020: dealing with global economic crisis and it's aftermath: structural unemployment and emigration, economic recovery and return immigration since 2018, implementation of the EU structural support measures
VET curriculum change and reforms	De-ideologisation of the VET curricula, delegation of the responsibility for the VET curriculum design to the VET providers.	Attempts of matching VET curricula with labour market needs: introduction of competence-based VET standards in 1997-2008, provision of autonomy for VET schools in curriculum design.	Systemic VET currriculum reforms in the context of the implementation of the LTQF (2010) , competence-based occupational standards which define qualifications in the sectors (2013-2019), national modular VET curricula.
Change of the institutional settings of VET provision and skill formation	1990-2004. Disruption of the institutions of the Soviet "dual" VET provision, optimisation of the regional networks of the VET providers, establishment of the separate institutional patways of the initial and continuing VET, introduction of legal regulation of VET provision (VET law in 1997) stipulating school-based VET provision, strong orientation of VET to the employment and social inclusion.	2004-2012 Consolidation of the public VET provision, attempts to introduce independent competence assessment by delegating it to the chambers of commerce, industry and crafts, legal recognition of apprenticeship as alternative pathway of the VET provision in the VET law of 2007, introduction of the possibility for VET providers to become public entities with participation of social partners in their management, abolishment of labour market training system.	2013-2020 Developmental work-based learning orientation and strengthening of the technological and material potential of the VET providers: establishment of the sectoral practical training centres, introduction of the status of the public bodies for the all public VET providers, experimentation of the apprenticeship schemes, centralisation of the enrolment of the VET students on the basis of the national monitoring of human resources.

Post-Soviet transition VET reforms in the radically changing socio-economic context led to the development of the school-based VET with strong 'social' or second chance orientation (e.g, establishment of the seprate sub-system of "labour market training" for unemployed), which was strengthened by the negative image of VET as a legacy of the Soviet period and fast massification of the higher education. There were also ideological aspects of downplaying

the role of VET in the re-establishment of the independent state and free society by the governments. The post-Soviet educational reforms during their first stage took the "restitutive" orientation and were inspired by the attainments of education system of the first Republic of Lithuania in 1918-1940, where VET played only secondary role of the social levy for the children of socially disadvantaged and low-income families (Poviliūnas 2000 ;Saniter, Tūtlys 2016). These reforms were also focused on dealing with the inherited institutional infrastructure and it's adjustment to the new needs and demands (optimisation of the network of VET providers). These preconditions defined comparatively late reforms of VET curricula (introduction of VET standards in 1997).

Euro-integration was the key factor of the VET curriculum reforms and institutional change of the VET system in the second decade of the independent state. The role of VET in the EU policy agenda, promotion and development of lifelong learning, active EU support in policy learning created preconditions for the systemic attitude of the reforms in the fields of VET curricula and qualifications, strengthened the 'economic' orientation of the VET policy initiatives with the focus on the matching of supply and demand of skills and work-based learning (introduction of apprenticeship as alternative in the Law on the Amendment of the VET Law in 2007) and systemisation of the provision of qualifications (approval of the Lithuanian Qualifications Framework in 2010 and it's referencing to the EQF in 2012). Development of the system of qualifications acquired more dynamic character in the aftermath of economic crisis, which has important negative consequences for the VET (increase of structural unemployment, emigration, brain-drain) and strengthened "developmental" and labour market orientation of the VET policy (introduction of the competence-based occupational standards and modular VET curricula, establishment of the sectoral practical training centres and promotion of WBL and apprenticeship, openning of the public VET providers for the external stakeholders, centralisation of the enrolment of students in VET on the basis of national monitoring of human resources, etc.). This period has been marked with more active involvement of social partners (especially employers and their organisations) in the policy of VET and qualifications, especially on the national and sectoral levels (e.g., through established sectoral professional committees responsible for the quality assurance and approval of the occupational standards and national modular VET curricula). The future development scenarios of VET are rather unclear and complicated by the current global disruptions. However, it looks like the dominant orientation is development of the pluralistic VET pathway, which is open for everybody, flexible in terms of curriculum and forms of training, well matches the changing skills needs and work processes on the local, national and (in some sectors) global labour market.

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