

# Mapping future competences as part of systemic measures for defining labour market requirements - Competences 4.0 project

POLICY DEVELOPMENT

PRACTICAL MEASURE/INITIATIVE

 CZECHIA

## Timeline

2020 Implementation

2021 Implementation

2022 Completed

ID number 39010

## Background

Among EU countries, the Czech Republic reports the highest industry share in total GDP, exceeding 45%. New requirements brought about by the fourth industrial revolution, including the trend of digitisation, automation, and subsequent changes in the labour market, call for flexible adjustments in the system of competences. Given expected changes in the labour market, it is necessary to transform education in a short period of time, re-evaluate the role and content of initial education, and set up a system of lifelong learning as a natural part of everyone's life path.

The use of competence pyramids in initial education can contribute to the innovation of the system of fields of study and modernisation of the content of education in various fields. These start with the vocational fields of study with or without a *Maturita* exam (especially with respect to common professional basis within the relevant group of fields of study) and end with professionally oriented fields of study at the tertiary professional level. Continuing vocational education and training offers the option to use competence pyramids in the development of retraining programmes as well as reskilling and upskilling programmes in line with EU employment policy.

A regular update of the so-called sector competence pyramids is a prerequisite for effective changes in lifelong learning. Competence pyramids contain a set of knowledge, skills, abilities, attitudes and values for specific employment in the labour market. They should help to define sector specific competences to be reflected by the educational system.

## Objectives

For both initial and continuing vocational education and training, it is primary issue to increase the relevance of educational programmes in relation to the changing qualification requirements of the labour market.

The aim of the project is to map future competences and create updated competence pyramids for 10 selected sectors, in which the most robust shifts concerning the requirements for workforce qualifications are expected to occur. The objective of the project is to develop and expand partnerships between companies and schools in four

regions of the Czech Republic. Therefore, one key activity of the project also includes verification and introduction of elements of dual education (particularly work-based learning/practical training in companies) and their incorporation in school curricula.

## Description

In the framework of the Competence 4.0 project (2019-22; Operational programme Employment, Ministry of Industry and Social Affairs), the Confederation of Industry of the Czech Republic, Czech Chamber of Commerce and the consultancy company TREXIMA jointly participate in mapping new future competences associated with the introduction of Industry 4.0 in the Czech Republic.

Other expected project outputs include:

- (a) analyses of international studies and labour market trends;
- (b) methodology of mapping future labour market competences with the involvement of sectoral and cross-sectoral working groups, including setting up basic rules for establishing cooperation between companies and schools;
- (c) a methodology for creating sectoral competence pyramids as a tool for systemic definition of labour market requirements and the related proposal for updating the central competence database with the descriptions of emerging competences and, in the future, required competences in relation to industry 4.0;
- (d) development of 10 sectoral competence pyramids in individual sectors with a link to the fields of education;
- (e) regional workshops around the topic of school-company partnerships and 10 sectoral round tables dealing with the topic of sharing the information on new competences and their transfer to vocational training.

### 2020 Implementation

The project carried out analysis of international studies and labour market trends. It processed good practice examples from, Denmark, Germany and Austria many of their elements could be used in the Czech Republic. The study also includes draft recommendations for public policies, including the employment and education policy of the Czech Republic. The results of the analysis of foreign labour market trends and interviews with the leaders of Industry 4.0 were used as a support for the selection of sectors where the forthcoming shifts in competences would be mapped. Working groups consisting of representatives of the business, research, development, innovation, and education spheres were established for the following 10 priority sectors: electromobility, logistics, chemistry, construction, mechatronics, modern industrial/engineering production, ICT activities (focus on cyber security), creative industries (focus on the gaming industry), wholesale, retail and e-commerce, and the food industry. Since December 2020, 130 members of these working groups have started identifying future competences in 10 priority sectors (especially classification, their interconnectedness, and integration into the context of broad professional qualifications) and in the development of sectoral competence pyramids as well as in searching for links to the National system of occupations and the National register of qualifications.

A methodology has been developed that sets out the rules and procedures to map and classify the competences required by the future labour market in relation to the fourth industrial revolution and facilitates the transfer of labour market requirements into education.

At regional level, representatives of four territorial employment pacts of the Moravian-Silesian, Ústí nad Labem, Zlín and Central Bohemian regions participated in the project as project partners. In these four regions, partnerships between upper secondary schools and companies were in the process of being established to verify the project outputs of the elements of dual education.

### 2021 Implementation

In 2021, the methodology proposed in 2020 was fully validated. A total of 10 working groups mapped new trends in the priority areas of electromobility, logistics, chemistry, construction, mechatronics, modern industrial/engineering production, ICT (with a focus on cyber security), creative industries (focus on the gaming industry), wholesale, retail and e-commerce, and the food industry. The main focus was on new and future changes related to digitalisation and other technologies related to the Industry 4.0 concept. These sectoral analyses were one of the starting points for identifying new competences. At this stage, the new competences had already been named and classified according to different aspects. Attention was also paid to different categories of transversal competences, such as those needed in different types of workplaces (soft skills). The activities were carried out in close cooperation with the National Pedagogical Institute (NPI) responsible for the development and modernisation of secondary vocational education and training framework educational programmes. NPI monitors inputs from sector experts and uses them in the modernisation of existing programmes or the design of completely new VET programmes.

By the end of 2021, 37 partnerships had been established in the participating four regions. In half of these partnerships, the concept of 'standard of practice' in terms of the Czech VET system, i.e. as a minimum standard of work-based learning, were also being piloted.

## **2022 Completed**

In November 2022, the Methodology for mapping future labour market competences was published with the involvement of sectoral and cross-sectoral working groups. The methodology sets out the rules and procedures for mapping and classifying the competences required by the future labour market in relation to the 4th Industrial Revolution and systematically organising them into the so-called competence pyramids as a basis for their implementation in initial and continuing VET, including the setting up of the necessary cooperation between research, development, education and employers. The methodology sheds light on the procedures for identifying cross-cutting skills and, as a next step, for defining sectoral and cross-sectoral clusters of groups of competences.

It is aimed at members and coordinators of the sectoral Innovation working groups, which had a total of approximately 130 members, including the experts of the National Pedagogical Institute who are involved in the revisions of the Framework Educational Programmes. The methodology guide is intended for key actors in employment and education policies, developers of national occupational and qualification frameworks, educational concepts and curricula at national, regional and local levels, schools, etc. It provides guidance to the representatives of the decision-making and implementation spheres through basic steps of mapping, defining competences and creating competence pyramids.

At the end of November, the final conference entitled Competences for the Future was held presenting the outputs of the Competences 4.0 project, which was completed at the end of the year. The conference was organised by the Ministry of Labour and Social Affairs.

Two key tools of the project were presented at the conference. One of them was the New Skills Monitor, which is used to map emerging and anticipated labour market needs. It captures the qualitative trends and changes that are linked to changes in technology, and have an effect on the changing nature and organisation of work and process settings. Where appropriate, it identifies their impact in the near future. Another important tool for describing skills is the competence pyramids, which is a hierarchical and systematically classified summary of competences in a given sector. The use of competence pyramids allows general and occupational competences (knowledge and skills) to be organised from the basic to narrow specialisations. It is a sectoral competency model that categorises skills into clear groups allowing for a dialogue between employers and educators. Such a dialogue can help to identify new occupations, new fields of study or the revision of the existing ones.

Thanks to project activities, 36 partnerships between employers and schools in four

regions of the Czech Republic have been established over time. A total of 37 companies and 31 schools with 34 fields of study engaged in mutual cooperation. More than 1,400 students participated in vocational training directly at the employers' premises. In the course of the project, experts identified more than 1,700 new skills using the New Skills Monitor tool and created 20 sample profiles of modern occupations, setting the stage for the creation of new fields of study for secondary VET. Eventually, the project directly resulted in formulating six new fields, such as Games Developer or Mechatronics Technician.

The project was finalised on 31 December 2022.

## Bodies responsible

- Ministry of Labour and Social Affairs
- Confederation of Industry of the Czech Republic
- Czech Chamber of Commerce

## Target group

### Learners

Learners in upper secondary, including apprentices  
Young people (15-29 years old)

### Education professionals

Trainers

### Entities providing VET

Companies  
Small and medium-sized enterprises (SMEs)

### Other stakeholders

Social partners (employer organisations and trade unions)

## Thematic categories

### Governance of VET and lifelong learning

Engaging VET stakeholders and strengthening partnerships in VET

### Modernising VET offer and delivery

Modernising VET standards, curricula, programmes and training courses  
Reinforcing work-based learning, including apprenticeships

## Subsystem

IVET CVET

## Further reading

[Website of the project on the Ministry of Social Affairs webpage](#)

## Related policy developments

## 2024 Implementation

### Innovation of the fields of study system

By 2023, the VET system will be structured to focus on the common professional basis within the relevant group of fields of study. This innovation will allow for a gradual choice of career paths and will able learners to postpone early specialisation.

 CZECHIA

#### Type of development

Regulation/Legislation

#### Subsystem

IVET

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## 2024 Design

### Quality standards for company and school-based workplaces for practical training

The Ministry of Education, Youth and Sports focuses on expanding options for students to get practical training in a real work environment with the use of elements of the dual system of VET.

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#### Type of development

Practical  
measure/Initiative

#### Subsystem

IVET

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## 2024 Design

### Revision of the national curriculum for upper secondary education

In 2017, the Ministry of Education approved a proposal for revising the national curriculum for upper secondary education (RVP) and the educational programmes of individual schools (SVP). The revision of curriculum documents is among the national priorities until 2020.

 CZECHIA

#### Type of development

Practical  
measure/Initiative

#### Subsystem

IVET

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**2024 Implementation**

## **Reinforcing cooperation between schools and employers**

The Amendment to the School Act, which came into force in September 2017, obliges schools to develop, with regard to the field of study, efforts to support cooperation with employers towards joint fulfilment of the objectives of secondary education.

 CZECHIA

### **Type of development**

Regulation/Legislation

### **Subsystem**

IVET CVET

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**2024 Implementation**

## **Adjusting curricula to labour market needs**

Proposals for legislative and institutional changes aiming to improve the transition from school to labour market by extending the duration of in-company training; in EQF 4 programmes, workplace internship usually takes two weeks only, hence the proposal for extension to eight weeks.

 CZECHIA

### **Type of development**

Practical  
measure/Initiative

### **Subsystem**

IVET CVET

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**2022 Completed**

## **Piloting dual training**

A memorandum on piloting elements of dual training was signed by the Ministry of Education, Moravia-Silesia Region and the Confederation of Industry in October 2017. The piloting phase started in September 2018 in cooperation with four upper secondary VET schools and three companies.

 CZECHIA

### **Type of development**

Practical  
measure/Initiative

### **Subsystem**

IVET CVET

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## 2024 Implementation

### Strategy to support small and medium-sized enterprises in the Czech Republic 2021-27

Strengthening cooperation between companies, especially SMEs and schools, will be implemented by means of promoting and organising joint events. The strategy also promotes organising of students' work placements and internships in businesses.

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#### Type of development

Strategy/Action  
plan

#### Subsystem

CVET

#### “ ... ” Cite as

Cedefop, & ReferNet. (2025). Mapping future competences as part of systemic measures for defining labour market requirements - Competences 4.0 project: Czechia. In Cedefop, & ReferNet. (2025). *Timeline of VET policies in Europe* (2024 update) [Online tool].

<https://www.cedefop.europa.eu/en/tools/timeline-vet-policies-europe/search/39010>