

Co-funded by the
Erasmus+ Programme
of the European Union



WP2: ANALYSIS OF QUALIFICATION FRAMEWORKS REPORT ON ANALYSIS OF QUALIFICATION FRAMEWORKS



Project title: Improving Skills in Vocational Education and Training

Project website: www.improvet.hgk.hr

Programme: Erasmus+Key Action: KA3 – Support for Policy Reform

Project number: 597884-EPP-1-2018-1-HR-EPPKA3-VET-JQ

Agreement Number: 2018-1714

Work Package: WP2

Deliverable: 2.2.

Deliverable title: **Report on Analysis of Qualification Frameworks**

Document type: Report

Date of delivery: 16.4.2019.

Prepared by: P3 - Institut društvenih znanosti Ivo Pilar

Version/Revision: 2.0

Contents

1. Introduction	4
2. Qualification frameworks as a context for research activities	5
3. Conceptual and methodological approach	10
4. Research methods and research procedure	13
5. Research analysis	17
5.1. Overview of qualification frameworks and qualification development in Croatia and Slovenia	17
5.2. Analysis of the current situation in education, training and employment for Mechanical Engineering Technicians in Croatia and Slovenia	28
6. Concluding remarks and recommendations	36
7. References	37

Disclaimer: *The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.*

1. Introduction

This document provides information about the general methodological approaches in WP2 regarding to the analysis of qualification frameworks, detailed information about conceptual and methodological approach, description of methods, description of research procedure, analysis framework and description of approaches in stakeholders' analysis. Additionally, information obtained in the performed analysis is provided in the report.

All the described activities should be contextualized in the scope of the **WP2: analysis of qualification frameworks**. General objectives of activities of this WP are to ensure the conceptual and methodological foundation of ImproVET project activities, and to provide basis for a research of the state-of-art of national qualification framework (NQF).

Key objectives of overall WP2 activities are the following:

- Provide a short overview of qualification frameworks and qualification development in Croatia and Slovenia (brief presentation and comparison)
- Analysis of the current situation in education, training and employment for engineering technicians in both countries

All the project team members participated in WP2 activities, with P3 providing methodological and conceptual guidance. The procedure of activities included three connected parts. In the first part P3 conducted a desk research of relevant legal and strategic documents, published papers, etc. This part included active collaboration and participation of all the partners, who shared information, practices and their experience and expertise related to the national qualifications' framework. In the second part, P3 conducted several interviews (in person and via e-mail) with key stakeholders (i.e. representatives from VET sector, industry representatives - employers, and experts from academic setting) in Croatia and Slovenia. Project partners were actively included in the research and assisted in reaching the key stakeholders. Both parts were targeted to general aims, whereby the analysis of the current situation in education, training and employment for engineering technicians in both participating countries was conducted as an important outcome. The WP activities were finished with a report, in which an overview of conducted research activities, stakeholders' analysis, and conclusions are provided.

2. Qualification frameworks as a context for research activities

The starting point for the realization of all project activities was a comprehensive analysis of qualifications frameworks, which includes the basic information on the concept of qualifications framework, an overview of the qualifications framework development in Croatia, Slovenia and the European context, an overview of the current state, an analysis of mutual coherence and comparability of national qualifications frameworks, as well as comparability with European and other national experiences, and a detailed analysis of some of the challenges in the context of activities realized within qualifications frameworks, as in relation to it.

For the purpose of design of methodology within this delivery, our starting point were basic available information on the history and current state of the qualification's frameworks.

Like in other national experiences, in Croatia the efforts and the process of modernization of education, educational, training and qualifications systems, matching education and labour market, are incorporated into a general agenda known as the Croatian Qualifications Framework (CROQF). As stated in the available sources, the CROQF clearly establishes several mechanisms, among which the possibility of a systematic analysis of work offer and work demand at the level of competencies, i.e., knowledge and skills that can be placed in the context of educational outcomes is of special importance. As stated in relevant documents, the CROQF ensures an examination of needs based on analytical backgrounds, access to qualifications acquisition, and their quality and accessibility, and link between qualification levels in Croatia and the levels of EQF (European Qualifications Framework for Lifelong Learning) and QF-EHEA (Qualifications Framework for the European Higher Education Area), and indirectly with levels of qualifications frameworks of other countries.

The Croatian Qualifications Framework effectively links occupations with qualifications and provides the possibility to harmonize the educational system with the needs of the labour market. This process begins with the development of occupational standards, whereby ministry responsible for labour is a public body in the Republic of Croatia responsible for all the tools and methodologies, as well as guidelines for the development and evaluation of occupational standards, and it is also responsible for the entry of occupational standards into the Croatian Qualifications Framework Register, the Occupational Standards sub-register. Occupational standard is a document in which the key tasks and competencies required for a particular occupation are clearly stated, as well as the sets or units of competencies that will be linked to the learning outcomes in the qualification's standard. Entry of occupational standards in the CROQF Register (Occupational standards sub-register) will enable the linking of occupational standards and qualification standards.

In activities conducted so far, the ministry responsible for labour has developed several tools: The Occupational standards survey, Methodology for designing and interpreting sector profiles, ten sector profiles, the Internet interface, Guidelines for the occupational standards development, and Guidelines for the evaluation of proposals of occupational standards and units of competencies. The procedure of the Occupational standards survey administration is defined by the Guidelines for the occupational standards development, and information on key tasks and associated knowledge and skills needed for jobs that make up one occupation are collected on a sample of employers. Recognition of knowledge and skills needed by a larger number of employers leads to the possibility of occupational standards development. In the past, The Croatian Employment Service has so far conducted a survey for 62 occupations, of

which for 54 of them occupational standards have not been completed and they are defined as priority. The Methodology for designing and interpreting sector profiles defines the process of designing and interpretation of the sector profiles for the purpose of occupational standards proposal development. Sector profiles are documents that outline the state of a particular sector at a certain point in time and show the most important elements within each sector. In addition to the Occupational standards survey used in the development of occupational standards, the sector profiles serve to evaluate the offer and demand for sectoral knowledge and skills. Therefore, profiles are an important link in determining the current but also the future labour market needs.

In order for the occupational standards proposers to be informed of the current situation and any changes in the sectors, an Internet interface is available, and an update is currently in the process, for the purpose of better functioning and browsing. Interface is a research tool that combines all the data in one place, i.e. all the characteristics that describe a particular sector of the labour market, from employment data and sector employment and unemployment rates, to data on secondary and higher education for occupations in a particular sector. Since the interface data is updated on a monthly basis, it allows occupational standards proposers to access the latest data and the labour market situation and will represent the key professional background in the development of occupational standards. The new interface will contain additional data not only for the needs of the standards of occupations and qualifications standards proposers, but also for key stakeholders' decisions on policy making in the domains of employment and education. Also, in accordance with the Strategy for Lifelong Career Orientation and Career Development in the Republic of Croatia from 2016 to 2020, the interface will serve the general public as an aid in making personal decisions during continuing education and choosing a career path.

Entry of occupational standards into CROQF Register (the Occupational standards sub-register) enables linking occupational and qualifications standards, as well as the National Classification of Occupations (NCO) update process. The ministry responsible for labour is responsible for management and coordination of NCO update process, on the basis of the Conclusion of the Government of the Republic of Croatia from 20 December 2012. The National Classification of Occupations, as a national standard for official statistics, provides unambiguous communication between data provider and data users, primarily in the official statistics of the Republic of Croatia, but also in job placement, education, human resources development and management, science and other research.

From available information sources and existing overviews, it is evident that the Slovenian Qualifications Framework (SQF) was formally launched at the end of 2015, with the adoption of the NQF Act on 12 January 2016. SQF represents a unified system for the classification of qualifications into levels regarding learning outcomes. SQF contains 10 levels, enabling flexible links between the education and qualification structures, and captures national educational and labour market traditions.

The main role of the Slovenian Qualifications Framework is to give explanations on horizontal and vertical relations between different types of qualifications, certificates and diplomas/degrees. This act marked the inclusion in the SQF of all qualifications that can be acquired in Slovenia. The framework consists of level descriptors, whereby each level descriptor is described in terms of learning outcomes.

The purpose of the Slovenian Qualifications Framework (SQF) is to achieve transparency and recognisability of qualifications in Slovenia and the EU, while its fundamental objective is to support lifelong learning; to connect and coordinate Slovenian qualifications subsystems; and

improve the transparency, accessibility and quality of qualifications regarding the labour market and civil society.

Slovenia's NQF does not represent a reform framework, because it is based on existing education legislation and established practices. Slovenia developed its NQF and referenced it to the EQF (EACEA - National Qualifications Framework, 2019). Slovenia began preparations of its National Qualification Framework (NQF) based on the recommendations of the European Parliament and the Council of the European Union on the establishment of the EQF. According to Mikulec and Ermenec (2016), financial support for the development of the NQF was provided by the European Social Fund, under the "Operational Programme for Human Resources Development for the Period 2007–2013." Since 2010, Slovenia, like other member states and candidate countries, has also been receiving financial support from the Commission via the project "Activities of EQF National Coordination Points with a view to implement the EQF at national level" between 2009 and 2014, with the help of these financial mechanisms. The biggest structural and curriculum reforms to the education system in Slovenia's recent history occurred in the early 1990s after Slovenia became an independent state, when the concept of a curriculum-based learning outcomes was introduced. The "shift to learning outcomes" took place back in the early 1990s (CEDEFOP, 2009). The framework contains 10 levels, where level descriptors based on the EQF model are expressed in terms of knowledge, skills, and competences, although their definitions are slightly more precise and adapted to the existing national system.

Learning outcomes in Slovenia represent standardized units of knowledge; they are derived from general educational aims; they require educational institutions and teachers to take responsibility for their achievement at a minimum level; and they take the form of learning objectives and standards of knowledge. Learning outcomes are built into the education programs provided by accredited educational institutions.

A conceptual predecessor of the present qualifications' framework can be traced back to the former Yugoslavia. It was put in place in 1980 by the Social Agreement on Uniform Bases for the Classification of Occupations and Professional Education. The government, self-governing interest groups for education and employment and social partners (unions, commerce chambers at the federal level) jointly adopted this agreement introducing an eight-level classification scale for different occupations, based on the "difficulty level, knowledge, skill and ability to perform". Educational programmes were adjusted to occupational requirements. Nowadays this eight-level scale is not in line with the European Qualifications Framework, however, the scale is still in use in some contexts (collective agreements, job offers, staff regulations etc).

In 2005, a year after Slovenia's EU accession, a national discussion was conducted on the European Qualifications Framework (EQF) for lifelong learning. This discussion led to the development of the Slovenian Qualifications Framework (SQF). In 2006 the government introduced the Classification System of Education and Training. This classification groups educational activities and outcomes on an eight-level scale. The classification is a mandatory national statistical standard rather than a national qualifications framework, but it did serve as one of the starting points in the design of the SQF. In the same year, the Higher Education Act was amended, and it stipulated the adoption of a national higher education qualifications framework. This framework was to serve as a tool for the determination of the principles and outcomes of study programmes in terms of knowledge, skills and competences.

In 2008, the ENIC NARIC Centre, the competent authority for the assessment and recognition of education, at the time operating under the auspices of the Ministry of Higher Education, Science and Technology collaborated on a project which findings were meant to assist experts from different countries to further devise and implement the EQF as well as to draft national

and regional qualifications frameworks. Subsequently, the Ministry of Higher Education, Science and Technology and the Ministry of Family, Labour and Social Affairs commissioned targeted research projects, and the government appointed the Steering Committee for the elaboration of the National Qualifications Framework in accordance with the European Qualifications Framework in early 2010.

The following institutions and organisations were included in the Steering Committee: Ministry of Education, Science and Sport, Ministry of Labour, Family and Social Affairs, Institute of the Republic of Slovenia for Vocational Education and Training (CPI), Chamber of Commerce and Industry of Slovenia, Chamber of Craft and Small Business of Slovenia, Association of Employers in Small business and Craft, Slovenian Association of Free Trade Unions, Statistical Office of the Republic of Slovenia, Student Organisation of Slovenia and School Student Organisation of Slovenia. The Steering Committee had formal decision-making powers regarding the development of the SQF. In co-operation with a three-member expert group, the Steering Committee developed the initial proposal for a ten-level National Qualifications Framework and launched a public consultation in early 2011. The first round of consultation entailed meetings with representatives of employers, schools, higher education institutions, trade unions and ministries. Input provided by these stakeholders was incorporated in the new draft, which was presented at the National Consultation on the Slovenian Qualifications Framework. This conference was open to all interested stakeholders. The final proposal, developed in May 2011, reflected the stakeholders' input (Institute of the Republic of Slovenia for Vocational Education and Training)

As is stated in existing overviews, the main objectives of the SQF are to support lifelong learning; to connect and coordinate Slovenian qualifications subsystems; and to improve the transparency, accessibility and quality of qualifications.

The NQF Act stipulates that the national coordination point for the SQF and EQF operates within the Institute for Vocational Education and Training (CPI). The national coordination point provides administrative and general support to the seven-member expert committee that is appointed by the Minister of Labour. This expert committee brings together representatives of three ministries (in charge of labour, education and economic development), as well as of employers and employees. Among other tasks, the expert committee defines standards for the integration of additional qualifications into the SQF. The committee also monitors the overall development of the SQF, EQF and the qualifications framework for the European Higher Education Area (EHEA). The national coordination point is tasked with, among other things to ensure access to information on and the promotion of the SQF and EQF, to manage the process of approving and registering qualifications, to coordinate the positioning of the SQF within the EQF and cooperate with relevant EU institutions.

Regarding the content of the SQF (Slovenian Qualifications Framework, 2019), the system includes formal education qualifications at all levels as well as qualifications obtained outside the system of formal education (National Vocational Qualifications and supplementary qualifications). In line with the EU-level policies, learning outcomes represent the core of the SQF. This is meant to contribute to the comparability and transparency of qualification systems, lifelong learning, recognition of non-formal and informal learning, quality assurance and a better integration between education and the labour market. The SQF contains ten levels, and level descriptors refer to learning outcomes in three categories: knowledge, skills and competences.

- Knowledge is defined as the result of learning and the assimilation of concepts, principles, theories and practices. Acquisition of knowledge takes place in various settings: in the educational process, at work and in the context of private and social life.
- Skills, the second outcome, may be cognitive (such as the use of logical, intuitive and creative thinking) or practical (for instance, manual, creative skills, use of materials, tools and instruments).

- Competences refer to the ability to use and integrate knowledge and skills in educational, professional and personal situations. They are classified in terms of complexity, autonomy and responsibility.

SQF also contains: Qualifications framework as a tabular presentation of categories and types of qualifications at 10 qualification levels, methodology of description and referencing of qualifications and register of SQF qualifications. The 10-level SQF is clearly related to eight EQF levels through descriptors for both frameworks, and SQF descriptors from levels six to 10 are related to descriptors in the qualifications framework for the European Higher Education Area (EHEA). Detailed description of SQF levels and level descriptors that refer to learning outcomes in aforementioned categories is available in the SQF brochure for professional public.

From the initial analysis of available information on qualifications frameworks in Slovenia and Croatia, it is evident that there are significant challenges and differences in qualification frameworks, as well as significant similarities that are ultimately reflected in the same goals. The two countries have to a certain degree different legislative framework, qualification development processes, different historical contexts regarding the obtained experiences, and differ in the level of achieved goals that were set in terms of qualifications frameworks current level of development. On the other hand, a common strategic goal and interest is reflected in the development of the system and the development of occupational and qualifications standards based on learning outcomes and in line with the needs of the labour market, needs of the individual and society as a whole, the goals of harmonizing national policies and activities with European guidelines and policies, and ultimately in ensuring effective social and economic development.

For the purposes of project activities, it is therefore necessary not to look only at the available existing information regarding the qualification frameworks. In addition, employing a scientifically rigorous methodology is also necessary to empirically analyse the situation regarding the qualification's frameworks, and to emphasize the advantages and possibilities, as well as identify the threats in the process of guidelines for a common qualification development.

3. Conceptual and methodological approach

For the purpose of overall WP2 goals, several particular activities have been considered and designed, that are methodologically oriented to respond to the overall project objectives. In accordance with the existing methodological requirements, in the first step the principles for the conceptualization of the methodological approach were considered. They can be formulated as the following principles:

- a) The realization of project activities must be based on existing legal provisions and normative acts and must be consistent with the expectations associated with existing regulation of the general project context as well as the specific activities that are related to and/or derive from the project activities. In considering the general normative framework, it is necessary to consider national frameworks and existing guidelines, recommendations and requirements set at the level of European Commission and other European bodies;
- b) The realization of project activities must have its foundation in contemporary scientific and research findings and the adopted conceptual and construct definitions, including the accepted operational definitions of specific concepts used in contemporary project and research activities;
- c) Conceptualization of project activities, consideration and proposals of individual solutions, as well as performance, must be in line with comparable national and European experiences, choices and solutions, and must ensure the sustainability of overall project outcomes in the national and wider context of EU guidelines and requirements;
- d) The design of the framework methodological approach and the plan of work follows the basic principle that for successful and timely execution of all the required activities it is necessary to follow the planned methodology of work, and the methodology of work must be strictly scientific and research-based, appropriate, valid, clear and feasible;
- e) The performance of all the project activities must be based on clear principles of competence, professionalism and responsibility for the undertaken activities, including continuous readiness and capacity for exchange of information, consideration of all perspectives, open and ongoing communication with all the partners involved in the project activities, and in particular with project promoters;
- f) Project activities should be carried out in a way that reflects the quality and professional co-operation of all the project actors;
- g) Project activities must include and reflect the capacity to consider different perspectives, needs and capacities of involved project parties and interested parties, as well as the appreciation of the existing or assumed limitations that arise, or it is reasonable to expect will arise, with certain suggestions of solutions as well as with making decisions and choices.

The methodological approach to the realization of the necessary research activities included several activities for which a suitable and appropriate research method was chosen. The activities were grouped according to their basic aims:

- a) Conceptual analysis of national qualifications frameworks in terms of theoretical outcomes and approaches to the conceptualization of fundamental constructs related to the distinction of occupations and jobs, key tasks, competences, knowledge and skills. Within

this analysis, it was necessary to carry out the analysis of taxonomy and classifications of fundamental constructs;

- b) Comparative analysis of conceptualization within the CROQF and SQF in the context of existing activities regulated by European guidelines and experiences (within ESCO, as well as other guidelines related to the field of occupational standards and qualification standards);
- c) Comparative analysis of operational approaches, forms and ways of defining and operationalizing the key constructs that are present in the nomenclature of the CROQF and SQF;
- d) Process analysis of methodological and organizational approaches and procedures as well as direct ways of organizing and carrying out activities of gathering the necessary information related to occupational standards and qualification standards
- e) Methodological and organizational analysis of approaches, procedures and ways of organizing and implementing the outcomes of activities related to the development of occupational standards and qualification standards, including activities related to official registration in the respective registers.

Realization of all the planned activities completely fulfilled the planned outcomes related to the content and goals of WP2. In the methodological sense, they can be grouped into two groups of activities. The first one relates to desk research, and the second to field research. Activities related to field research were achieved through the collection, analysis and appropriate interpretation of the information gathered from the immediate stakeholders in the activities related to the qualification frameworks. For the purpose of implementing this activity, a method of structured survey and interview method with the SWOT analysis elements was used. Through this research method, the following goals were achieved:

- a) Consideration of approaches to the conceptualization of fundamental constructs related to key tasks, competences, knowledge and skills;
- b) Consideration of the role, place and consistency of national qualifications frameworks with existing European guidelines;
- c) Consideration of the organization and implementation of activities related to the development of occupational standards and qualification standards through a process analysis of the organizations' steps in the implementation of activities;
- d) Consideration of the role of individual bodies, organizations and partners in the development of occupational standards and qualification standards, and consideration of the normative framework and the way of normative organization of the foreseen activities.

Summarised, the methodological approach for the realization of all activities within the WP is presented as:

Step	Activities	Method	Output/Indicator
1	Conceptual analysis of national qualification framework	Desk research, comparative method	Overview and review summary
2	Conceptual analysis of conceptualisation of key constructs in national qualifications framework procedure	Desk research, comparative method, interview, shortened SWOT analysis	Overview and review summary, list of key constructs with definitions
3	Analysis of current situation in education, training and employment for engineering technician	Desk research, comparative method, interview, shortened SWOT analysis	Overview and review summary of current situation
4	Analysis of the procedure in occupation and qualification standards formulation	Desk research, comparative method, interview, shortened SWOT analysis	Overview and review summary of current procedure

4. Research methods and research procedure

We will briefly describe the research methods and procedures that were used. As indicated, the main methodological approaches can be described as a desk research, complemented with field research which included structured interviews with stakeholders and survey with elements of SWOT analysis.

Desk research method was aimed at answering aims that refer to the conceptual analysis of qualifications framework, their theoretical foundation, origin, constructs and nomenclatures of constructs, and on considering their comparability in the context of the existing European guidelines. Realization of this step included analysis of numerous documents, such as different laws, bylaws, strategies, tools (guidelines etc.), existing research publications from national bodies, publications from key institutions (Cedefop, EC, etc.), with taking into account the available national reviews of qualifications framework with similar or same theme. This analysis was focused primarily on cataloguing the used constructs, description of qualifications frameworks structures, the review and comparison of possible theoretical taxonomies, and the description and comparative analysis of the methods of organizing the system of collecting, analysing and presenting outcomes of conducted activities related to the development of occupational standards.

Fieldwork included guided surveying and interviews with key stakeholders regarding the implementation of activities in the area of reviewing occupations and qualifications, development of occupational standards and qualifications standards. After the interviews were conducted and the information gathered, SWOT analysis was conducted with the aim to identify, based on facts, weaknesses of past activities on one hand, and on the other hand to consider the challenges and identify opportunities that are available, so that the overall activities in occupational standards development could be brought to a higher level.

As participants and co-speakers that can provide the necessary information for the surveys and interviews, stakeholders that have experience in activities related to occupational standards development were selected. Our goal was to empirically examine their experiences, roles, problems and challenges that they see in past procedures, as well as to determine what possibilities for improving the activities they recognize. Selection of participants was done in a way to cover both the normative and implementation area, which was ensured by participation of the representatives of the ministries and the agencies. It was also necessary to consider activities from the perspective of beneficiaries and directly involved stakeholders, which was ensured through the participation of representatives of school institutions, chamber of economy and chambers of trades and crafts.

Participants in survey and interview from Croatia:

Stakeholder	Representative	Role within organisation	Survey	Interview
Croatian Chamber of Economy	Božo Pavičin	Head of the Department of Education of the Croatian Chamber of Economy	yes	yes
Agency for Vocational Education and Training and Adult Education	Damir Zvonar	Senior adviser for mechanical engineering, shipbuilding and metallurgy	–	yes
	Dubravka Oršanić	Senior adviser for electrical engineering and computing	–	yes
	Danijela Pustahija Masulin	Senior adviser for fashion, textiles and leather	yes	yes
	Sandra Dobrić	Project manager	–	yes
Ministry of Labour and Pension System	Matej Petranović	Head of the Service for Harmonization of Education and the Labour Market	yes	yes
Ministry of Science and Education	Elisabetta Fortunato	Senior adviser at the Vocational Training Department	yes	yes

Participants in survey and interview from Slovenia:

Stakeholder	Representative	Role within organisation	Survey	Interview
Institute of the Republic of Slovenia for Vocational Education and Training (CPI)	Barbara Kunčič Krapež	Senior adviser for area III; Specialised in occupational standards, national occupational qualifications and connecting informal and formal education	yes	yes
	Jure Šuligoj	Senior adviser for area III; Specialised in coordination of SQF and EQF	yes	yes
Institute for Business Education (CPU)	Aleš Dremel	Director	–	yes
	Barbara Krajnc	Principal of Vocational schools	–	yes
	Urška Kavič Rihar	Head of competence certification	–	yes
	Sašo Pristavec	Project leader	–	yes
	Mojca Cek	Project manager	yes	yes

The survey was administered in written form to all the selected stakeholders, which they had the possibility to fulfil on their own. In the second step, structured interviews with all the stakeholders were conducted. Through guided conversation, items of interest were entirely discussed and analysed. Interviews were conducted promptly after the surveys, face-to-face.

In the guided surveying and interviews, the following thematic areas and questions within them were considered.

Questionnaire about qualification frameworks

I: Normative frame and normative organisation of planned activities

- How are activities regarding standards of occupation and qualification standards normatively regulated in your country (e.g. what laws, regulations, and/or guidelines exist)?
- What challenges and difficulties do you recognize in the normative regulation of activities around standards of occupation and qualification standards?
- Do you think there are some ambiguities in the normative organization of activities around the standards of occupation and qualification standards?
- Do you think that something needs to be changed in the normative arrangement of activities around the standards of occupation and qualification standards?

II: Conceptualization of fundamental constructs related to key tasks, knowledge, skills and competences

- What are the key elements used in the development of occupational standards in your country?
- What is the theoretical basis of key constructs, their classifications and types? (Note: When discussing the answer, consider the constructs of key jobs, different types and categories of knowledge, skills and competences, psychomotor requirements, and so on)
- What is the applicability of the used key constructs and their classifications regarding different occupations, sectors and especially in the context of the development standards of occupation and qualification standards?

III: The role, place and compatibility of national qualification framework with existing European guidelines

- In what way and to what extent does the existing qualification framework in your country comply with the existing European guidelines?
- Is there a need, willingness, and awareness in your country about the alignment of national activities with European activities?

IV: Method of organization and implementation of activities related to the development of occupational standards and qualification standards

- In the process of developing occupational standards in your country, what are all the sources of information that are being used, how is information gathered, and who and in what way is involved in this process?
- How is the whole process of developing occupational standards in your country organized, from start to finish?
- To what extent can the existing process of developing occupational standards ensure the comparability of outcomes (sectoral, cross-sectoral, national, international) in your country?
- How is the time perspective in the development of occupational standards and possibility of applying the process to new situations and new occupations ensured in your country?
- How is the process of evaluating occupational standards organized in your country, from start to finish?

- What are the overall strengths, opportunities, weaknesses and threats that are associated with the existing process of developing standards of occupation in your country?
- What are the overall strengths, opportunities, weaknesses and threats that are associated with the existing process of evaluating standards of occupation in your country?

V: The role of individual bodies, organizations and partners in the development of occupational standards and qualification standards

- How is the cooperation of individual bodies, organizations and partners in the activities regarding the development of standards of occupation and qualification standards ensured in your country?
- What is the role of individual bodies, organizations and partners in activities related to the development of qualification standards in your country?
- What challenges and threats arise in the existing mode of cooperation between stakeholders and what are the possibilities of improving this cooperation?

5. Research analysis

5.1. Overview of qualification frameworks and qualification development in Croatia and Slovenia

An analysis of the gathered information was conducted, which included the systematization of information collected through desk research (e.g. normative framework, available publications, scientific reports, review studies). In the second part, a qualitative analysis of the information gathered through surveys and structured interviews was conducted. In this part, focus was on the elements of the SWOT analysis matrix: identifying the existing state in terms of advantages and disadvantages, and projections of the future state in terms of opportunities and threats.

The outcomes of the analysis are presented regarding to stated aims and within the proposed framework of analysis.

Scope of comparison	CROQF	SQO
Normative framework	<p>The Croatian Qualifications Framework (CROQF) has been established by the Croatian Qualifications Framework Act. The same Act, among others, defines the advisory bodies, i.e. 25 Sectoral councils, and The National Council for Development of Human Potential, the strategic body for the development of CROQF.</p> <p>The Regulation on the Croatian Qualifications Framework Register prescribes the contents of the Qualifications standard and Occupational standards, the content and form of the entry of standard application forms, method of submission of the application to CROQF Register, and method of standards entry into the register.</p> <p>Ministry responsible for labour is responsible for conceptualization of methodology and procedures of formal evaluation, as well as for entry of occupational standards into the Register. For that purpose, the ministry developed Guidelines for the development and evaluation of occupational standards.</p> <p>Ministry responsible for science and education is responsible for the development of methodology and</p>	<p>Vocational Education Act stipulates that occupational standards are the basis for development of (vocational) educational programs in Slovenia.</p> <p>Rules on the Standard Classification of Occupations has defined procedures for production of occupational standards and catalogue of occupational skills.</p> <p>NQF Act was adopted on December 28, 2015, which regulates the procedures, competent bodies and organisations for the preparation and adoption of occupational standards, as well as the conditions and procedures of acquiring National Vocational Qualifications.</p> <p>It also stipulates that: (1) the national coordination point for the SQF and EQF operates within the Institute for Vocational Education and Training (CPI), whose task is, among other things, to promote SQF and EQF, to manage the process of approving and registering qualifications, to cooperate the positioning of the SQF within the EQF and to cooperate with relevant EU institutions; (2) the national coordination point provides administrative and general support to the seven members expert committee that is appointed by the Minister of Labour; (3) this expert committee brings</p>

	<p>procedures of formal evaluation of qualifications standards, and for their entry into the CROQF Register. For that purpose, the ministry developed Guidelines for development of qualifications standards, and Guidelines for matching study programs with qualifications standards.</p>	<p>together representatives of three ministries (in charge of labour, education and economic development), employers and employees, defines standards for the integration of additional qualifications into the SFQ and monitors the overall development of the SFQ, EFQ and the qualification framework for the European Higher Education Area (EHEA).</p> <p>SQF is based on the existing education legislation and established practices – it does not represent a reform framework. It is also based on the recommendations of the European Parliament and the Council of the European Union on the establishment of the EQF.</p> <p>Its development was financed from European Social Fund under the „Operational Programme for Human Resources Development for the Period 2007-2013“.</p>
Conceptual framework	<p>The Croatian Qualifications Framework is an instrument whose purpose is the regulation of the system of qualifications through qualification standards.</p> <p>Qualification standard, according to the CROQF Act, is a content and a structure of a qualification that includes all the information needed for setting its level, volume and profile.</p>	<p>It includes formal education qualifications at all levels as well as qualifications obtained outside the system of formal education (National Vocational Qualifications and supplementary qualifications);</p> <p>Learning outcomes represent the core of the SFQ – they are defined as standardized units of knowledge; they are derived from general educational aims and are built into</p>

	<p>The CROQF contains 8 levels and additional sub-levels, totalling 11 levels of full qualifications. The relating of CROQF levels with EQF and QF-EHEA levels is also described in the CROQF Act.</p> <p>The central elements of the CROQF are learning outcomes, and qualifications standards are based on them. Learning outcomes are defined as competences acquired through learning process and proved after that process.</p> <p>In CROQF, competences are defined as a set of knowledge and skills, with the associated autonomy and responsibility. So, the learning outcomes are expressed through knowledge and skills, and the respective autonomy and responsibility. Knowledge is defined as a set of acquired and related pieces of information, and within CROQF knowledge can be factual and theoretical. Skills are defined as a set of knowledge applications and the use of pre-known work modes in completing tasks and solving problems. Within the CROQF, skills can be cognitive (logical and creative thinking), practical (manual dexterity and the use of methods, instruments, tools and materials) and social (establishing and developing interpersonal relationships).</p> <p>CROQF also includes occupational standards that contain a list of tasks</p>	<p>the education programs provided by accredited educational institutions.</p> <p>SFQ contains 10 qualifications levels with level descriptors that represent a starting point for the assessment of suitability, difficulty and complexity of individual qualification. These descriptors of each level contain three categories of learning outcomes: knowledge, skills and competences; each higher level also includes the knowledge, skill and competence of lower levels and each qualification placed into the framework contains all three categories, but not every category necessarily carries the weight within the qualification.</p> <p>Knowledge is defined as the result of learning and the assimilation of concepts, principles, theories and practices; Skills are described as cognitive (e.g. the use of logical, intuitive and creative thinking) and/or practical (e.g. manual, creative skills, use of tools, materials etc.); Competences are defined as the ability to use and integrate knowledge and skills in educational, professional and personal situations – they are classified in terms of complexity, autonomy and responsibility and can be generic or vocationally specific.</p>
--	--	---

	<p>performed by an individual of a given occupation, and a list of competencies needed for successful completion of tasks. Occupational standard is the basis for the development of qualification standard in order to link education to labour market needs.</p>	<p>10-level SQF is related to EQF levels through descriptors for both frameworks, and SQF descriptors from levels six to ten are related to descriptors in the qualifications framework for the European Higher Education Area (EHEA).</p>
Implementation process	<p>The CROQF Register has been established, that is public and available on-line. It consists of the Sub-register of units of learning outcomes, the Occupational standards sub-register, the Qualifications standards sub-register, and Sub-register of units of competencies.</p> <p>A procedure for entry into the Register starts at the request of any legal entity or a natural person, as well as at the request of national authorities, providing that their interest has reasonable grounds.</p> <p>A request for entry into the Occupational standards sub-register is submitted to the ministry responsible for labour. The Occupational standards survey and the Survey report are used in the development of occupational standards. Strategic documents, laws, subordinate acts, different databases as online and national ministry responsible for labour statistics are used in the part related to the justification of the standard of interest.</p>	<p>First, any natural person or legal entity can submit the proposal for the preparation of an occupational standard.</p> <p>Second, the proposal is being examined for suitability, first by CPI then by sectoral committee for occupational standards.</p> <p>Third, a draft of the occupational standard is being prepared in collaboration between CPI and national working groups that consist of representatives of enterprises, the small businesses, service sector, etc.</p> <p>Fourth, a draft is being considered first by the sectoral committee for occupational standards, then by Expert Council for Vocational Education and Training.</p> <p>Fifth, Ministry of Labour, Family, Social Affairs and Equal opportunities is deciding if the proposed occupational standard will be adopted and published.</p> <p>Sixth, CPI is officially publishing and registering the occupational standard in the</p>

	<p>Employers participate in the survey, and the proposer, based on the collected data, prepares the survey report. Following survey, a focus group or a working group completes the proposal of the occupational standard and proceeds it to the ministry responsible for labour for formal evaluation, and to the sectoral council for professional evaluation. Upon receipt of the request, the sectoral council gives its opinion to the minister responsible for labour, and the minister determines the fulfilment of formal and professional conditions for entry into the Register.</p> <p>A request for entry into the Sub-register of units of learning outcomes or the Qualifications standards sub-register is submitted to the ministry responsible for education and science. Upon receipt of the request, the sectoral council gives its opinion to the minister responsible for education and science, and the minister determines the fulfilment of formal and professional conditions for entry into the Register.</p>	<p>register of the Slovenian Qualifications Framework.</p>
Stakeholders	<p>The National Council for Development of Human Potential;</p> <p>The ministry responsible for education and science;</p> <p>The ministry responsible for labour;</p>	<p>Ministry of Labour, Family, Social Affairs and Equal opportunities.</p> <p>Sectoral committees for occupational standards.</p> <p>Expert councils of the Republic of Slovenia for Vocational Education and Training.</p>

	<p>The ministry responsible for regional development;</p> <p>Sectoral councils.</p> <p>Certain state administration bodies and the competent VET agency, chambers and associations have defined priority occupations in priority sectors in order to speed up the process of development of occupational and qualifications standards, and, consequently, to adapt the educational programs to labour market needs.</p>	<p>Institute of the Republic of Slovenia for Vocational Education and Training (CPI) – founded by the Government of the Republic of Slovenia and co-founded by the Chamber of Commerce and Industry of Slovenia and the Chamber of Crafts and Small Business of Slovenia.</p> <p>Social partners (trade chambers, employers' associations, professional associations, NGOs, trade unions and competent ministries).</p>
Advantages	<p>Advantages concerning the process of development of occupational standards in Croatia are quality assurance processes and mechanisms, the possibility of interdisciplinary educational programs aligned with labour market needs and more employable labour force.</p> <p>Advantages concerning occupational standard evaluation procedure are uniformly educated members of sectoral councils whose task is the professional evaluation of an occupational standard.</p> <p>Occupational standards and qualification standards are linked through units of competencies.</p>	<p>An important advantage of Slovenian qualifications framework is the procedural central role of CPI, a government body of experts in qualifications framework with 15 years of experience. Their main focus is the development, research and counselling in the field of vocational and technical education and harmonising the interests between state and social partners.</p> <p>CPI is only producing occupational standards for Level of education 1-6, while University is in authority for level 7.</p> <p>The sectoral committees are performing the process of selection and elimination of proposed occupational standards in the very beginning of the process, and if the proposal of an occupational standard is</p>

		<p>accepted at the very beginning of the process, it is later very probably adopted and published.</p> <p>Slovenian qualification framework has different systems for evaluating gymnasium and vocational school programs.</p> <p>Slovenia has occupational standards that can be the basis for National vocational qualification (NVQ) system – in Slovenia it is possible to achieve NVQ through recognition of non-formal and informal learning.</p> <p>The survey that is used with employers and other professionals in the process of occupational standards development is developed by experts that are involved in all the steps of the process – they monitor, coordinate and direct the activities.</p> <p>In collecting the data from employers during the process of occupational standards development, the focus is on employees that are most acquainted with a specific workplace and have good insight into a specific workplace.</p>
Weaknesses	In the process of development of occupational standards, several weaknesses can be identified, mainly at the level of procedures and methodology, which jointly contribute to a small number	The main challenge of the Slovenian qualification framework system is also their potential advantage; Namely, their fieldwork procedures in collecting the data in the process of occupational standards development are more flexible and they

	<p>of expected occupational standards entered the CROQS Register.</p> <p>It should be more clearly stated and described who can propose an occupational standard.</p> <p>Secondly, the methodology of occupational standard development, evaluation, and entry into the CROQS Register is complex, and it is especially demanding in the part concerning occupational standard justification, since the national interface did not reach its full functionality and it is not possible to obtain fully updated information.</p> <p>The same methodology and approach are used for all levels of occupational standards.</p> <p>Extensive survey as the main basis for occupational standard development, employers' lack of motivation for participation in the survey and occupational standard development, and, consequently, in the process of educational programs and labour market needs matching.</p> <p>Method of selection, composition, and scope of sectoral councils, which should be closer to the business and economic sector.</p>	<p>constantly adapt their procedures to the current situation. Although this demonstrates certain amount of flexibility that is needed in these processes, it can also be challenging regarding the comparability of the published occupational standards.</p> <p>The lack of clear guidelines and criteria for sampling of employers in the process of occupational standards development. Any employer who is available and willing and considered to adequately represent the occupation is taken into consideration. This is problematic from the methodological standpoint because this type of employers' selection is subjective and can lead to biased conclusions.</p> <p>No uniform procedures and clear norms regarding interpretation of the data collected from experts or employers in the process of occupational standards development. This process is also rather flexible and left upon expertise and subjective assessment of those who work on the occupational standard to determine what will they transform into competency outcomes from the employers' output.</p> <p>It is not clear to the stakeholders for what level of employees' expertise is the occupational standard being made – is it</p>
--	--	--

	<p>Relatively unstructured procedure in which a main operational responsible body is missing.</p> <p>Weaknesses concerning occupational standard evaluation procedure are re-elections of sectoral council members, and modifications of methodology for development and evaluation of occupational standards during the process of evaluation.</p>	<p>being made to represent the best, average or novice worker?</p>
Opportunities	<p>The need for harmonization of activities with EU level activities (e.g. ESCO).</p> <p>The reconceptualization of methodology of occupational standards development in accordance with the stated needs to improve and speed up these activities.</p> <p>Occupations and qualifications can be reviewed, and skill-level register can be made in the future.</p> <p>Using and benefiting from the existing national and international experiences.</p> <p>Opportunities concerning the process of occupational standard evaluations are related to the ensured quality of vocational education, adult education and higher education due to large number of occupational standards (200) and</p>	<p>The need for harmonization of activities with EU level activities (e.g. ESCO)</p> <p>There is meaningful and high-quality cooperation between all the stakeholders, in which high levels of engagement and responsibility of sectoral committees and all other stakeholders are evident.</p> <p>All the stakeholders are not just in the function of monitoring and approval of proposals but are actively engaged in improving and finishing the occupational standards. This type of positive collaboration between the stakeholders gives good basis for further improvement and prosperity of the Slovenian qualification framework.</p> <p>The need for strengthen the central role of CPI.</p>

	<p>qualifications standards (240) developed, as well as the quality of educational programs based on those standards.</p>	
Threats	<p>Involvement of different stakeholders with different levels of expertise and different perspectives.</p> <p>Slow and lasting procedure of occupational standards adoption, which can lead to smaller number of employers willing to participate in their development.</p> <p>Delays in decisions on sectoral councils' appointment, which are responsible for occupational standards evaluation, as well as delays in evaluation methodology adoption, and in synchronization of laws and bylaws in accordance with the proposed amendments.</p>	<p>Establishing expert councils is dependent upon goodwill of the experts. They are in no way obliged to participate. If there is no interest from them to participate then the whole process of production of occupational standards comes in jeopardy. This can be especially challenging for the occupations that do not have many available experts to begin with.</p> <p>Although there are prescribed competency levels, types and their complexity within specific qualification levels, there are still existing challenges in practice to determine the optimal relation between level and broadness of a certain occupation.</p>

5.2. Analysis of the current situation in education, training and employment for Mechanical Engineering Technicians in Croatia and Slovenia

I. Analysis of the current situation in Croatia

According to the most recent National Classification of Occupations (2010), the profession of mechanical engineer technician is under code 3115 and refers to "technicians of mechanical engineering, shipbuilding and related professions". In the official database of the Croatian Employment Service (HZZZ) you can get insight into various statistical data for this occupation in the Republic of Croatia.

a) An unemployment analysis for the mechanical engineering technicians in Croatia

According to Article 10 of the Labour Market Act, an unemployed person is considered a person registered with the Croatian Employment Service, capable of being or partially capable of work, who is at the age of 15 to 65, is not in employment, does not carry out an independent activity, is actively seeking work and is available for work.

By analysing unemployment, the registered unemployment for the mechanical engineering technician in Croatia is relatively steadily decreasing from 2004 to 2019 - from 2.804 registered unemployed individuals in 2004 to only 789 unemployed in 2019. It is important to point out a sudden decrease in registered unemployment that is visible for the last three years - a decrease by almost half (46.5%) in registered unemployment. This is a possible indicator of increasing demand for this profession in the last three years. The overall unemployment rate for the occupation of mechanical engineering technician is less than 0.01%.

Also, what can be seen in the analysis of unemployment is the presence of higher registered unemployment in the Continental Croatia compared to the Adriatic Croatia, but in the last three years these differences are less pronounced because of a higher jump in the decline in unemployment in Continental Croatia.

	► 2004	► 2005	► 2006	► 2007	► 2008	► 2009	► 2010	► 2011	► 2012	► 2013	► 2014	► 2015	► 2016	► 2017	► 2018	► 2019
► Adriatic Croatia	818	703	600	494	397	470	623	647	681	673	684	596	520	374	288	301
► Continental Croatia	1,987	1,790	1,257	1,061	909	1,147	1,780	1,776	1,921	2,045	1,828	1,502	1,176	768	550	488
Total	2,804	2,492	1,857	1,555	1,306	1,617	2,403	2,423	2,602	2,719	2,512	2,097	1,696	1,142	838	789

Figure 1. Registered unemployment throughout the years for technicians of mechanical engineering, shipbuilding and related professions in Croatia

b) Analysis of the employment opportunities of the mechanical engineering technician in Croatia

An employment rate will be considered for an analysis of the employment opportunities for a mechanical engineering technician. Employment rate is the share of persons employed in the previous year compared to the average number of unemployed with the same occupation. The higher the employment rate the more people are employed. Depending on the employment rate level, five degrees of employment opportunities differ: very low employment opportunities (up to 20%); low employment potential (20-40%), average job opportunity (40-60%), high employment potential (60-100%); and a very high employment opportunity (more than 100%). For the occupation of the mechanical engineering technician, a high employment rate (705.3%)

was identified and the occupation was categorized as an occupation with very high employment opportunity.

Also, the registered job vacancies for the mechanical engineering technicians in Croatia can be considered. Job vacancies represent the total number of workers required by employers during the month or year. As can be seen, vacancies for the mechanical engineering technicians are in a relatively steady growth from 2004 to 2019, with a steeper increase in the last three years - it supports the assumption of increasing demand for this occupation in the last three years.

	► 2004	► 2005	► 2006	► 2007	► 2008	► 2009	► 2010	► 2011	► 2012	► 2013	► 2014	► 2015	► 2016	► 2017	► 2018
Total	688	584	790	866	713	355	373	500	574	660	875	1,088	1,275	1,704	1,829

Figure 2. Reported job vacancies for technicians of mechanical engineering, shipbuilding and related professions in Croatia

c) The dynamics of finding employment (duration of unemployment) for the mechanical engineering technicians in Croatia

The duration of unemployment is a feature that shows how much time the unemployed person spent in the Croatian Employment Bureau records from the time of his entry into the register until the date of his exit from the register. Persons up to 12 months in the register of unemployment are considered short-term unemployed and persons over 12 months fall into the category of long-term unemployed persons.

When analysing the duration of unemployment for the profession of mechanical engineering technicians for 2018, 62% of individuals find work within a year. Thus, 62% of unemployed individuals are considered short-term unemployed. At the same time, more than three quarters of mechanical engineering technicians (77%) find work within three years.

d) Recommendations for educational enrolment policy regarding mechanical engineering technicians in Croatia

By analysing the recommendations for the education enrolment policy, specifically for educational programs in which the number of enrolled students is to be increased, the mechanical engineering technicians are mentioned as an occupation for which the number of enrolled students should increase. Specifically, this concerns mostly Koprivničko-Križevačka and Primorsko-Goranska counties. There are also written recommendations for educational programs in which the number of enrolled students should be reduced, but the profession of a mechanical engineering technicians does not appear in any such list in any of the counties.

Also, the Croatian Employment Service (HZZZ) regularly conducts annual employer surveys in which employers state which jobs they consider to be in the greatest demand in the labour market. By analysing employers' surveys, the occupation of the mechanical engineering technicians is ranked third in the first six occupations of its occupation group. Thus, it can be concluded that there is a relatively large employers demand for the occupation of mechanical engineering technicians.

II. Analysis of the current situation in Slovenia

a) *Current situation in Slovenia*

Table 1. Technicians in technical-technological professions by years

	2016	2017	2018
Technicians in technical-technological professions	30.431	31.091	31.981

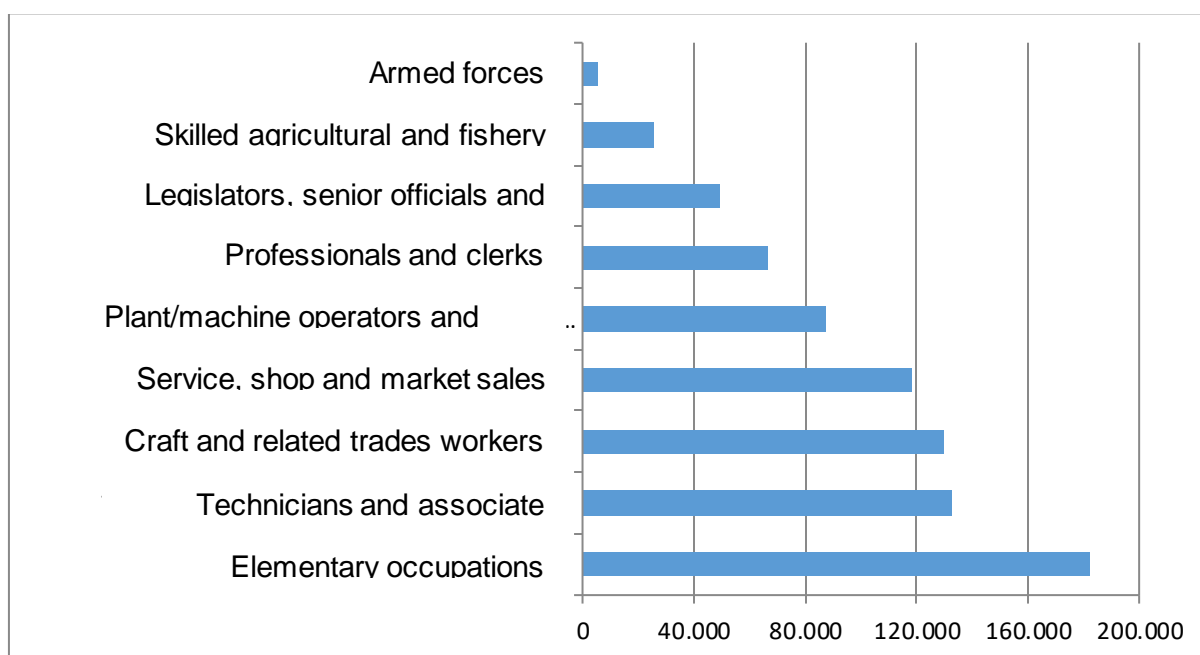


Figure 3. Persons in employment by major occupation groups (SKP-08), Slovenia, 2018

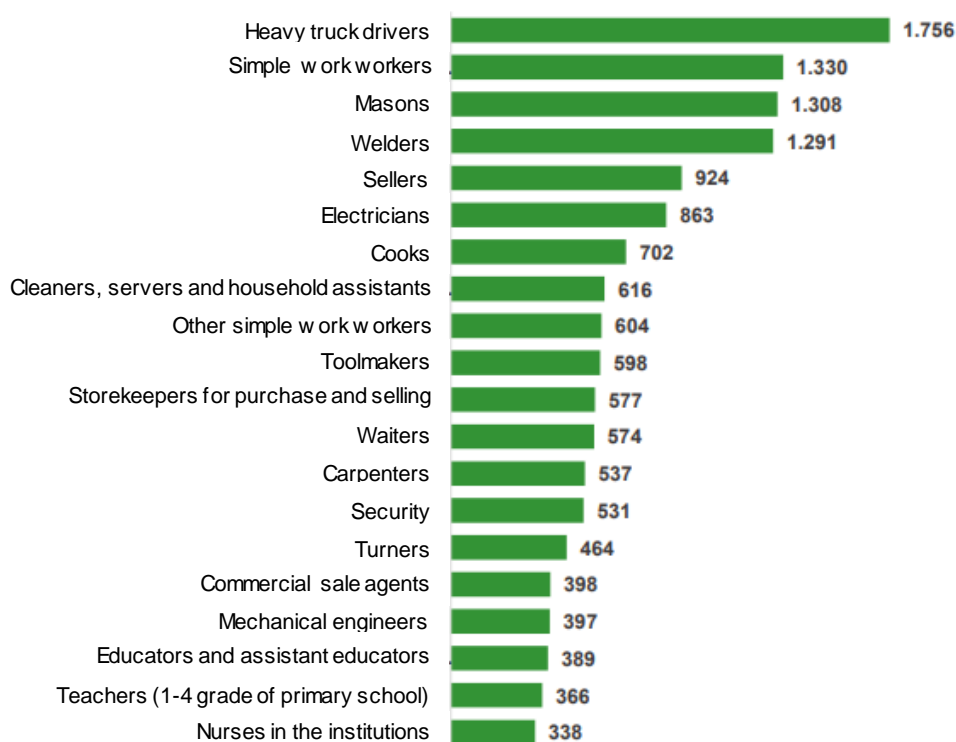
From the above tables the employability of technicians is increasing by years. Also, from the second table, it is evident that the group of professions Technicians and associates ranks second in the working population in Slovenia.

b) *Employment opportunities for mechanical engineering technicians in Slovenia*

The mechanical engineering technician can work in a number of areas: as an installer of air conditioning, gas and heating appliances, a sales representative or manager, a car dealer or technical equipment, a programmer and operator of computer controlled machines, a computer hardware maintenance provider, a car damage assessor, a security guard, constructor or technologist, manager of the company, head of production and sales units, foreman in the workshop or on the construction site, storekeeper, sole trader.

Due to the very diverse and many fields of work today, mechanical engineering technicians are considered to be one of the most profitable professions, they can be employed in all industrial, craft and service activities, trade or non-economic activities, in the fields of design, dimensioning and manufacturing of machine parts of tools and devices in the fields production and maintenance of machine parts and equipment, in the areas of measurement and control of process parameters, use and distribution of energy and energy sources.

The Employment Service of Slovenia published an interesting analysis of the Employment Forecast, which is carried out twice a year among employers with more than 10 employees. For the next six months, employers announced that employers would search for 31,100 new workers. Employers are mostly looking for workers because of substitutions (retirement, maternity leave and childcare leave, worker departures), and partly because of higher demand for products or services, expansion of activities.



Vir: anketa Napovednik zaposlovanja 2019/I

Figure 4. Top 20 occupations for which employers will most often seek out workers

The figure above shows that the demand for mechanical engineering technicians will continue to increase in the future, as they are represented in three categories: welders, turners and toolmakers with the emphasis on the fact that only the first 20 most demanded occupations are presented in the graph.

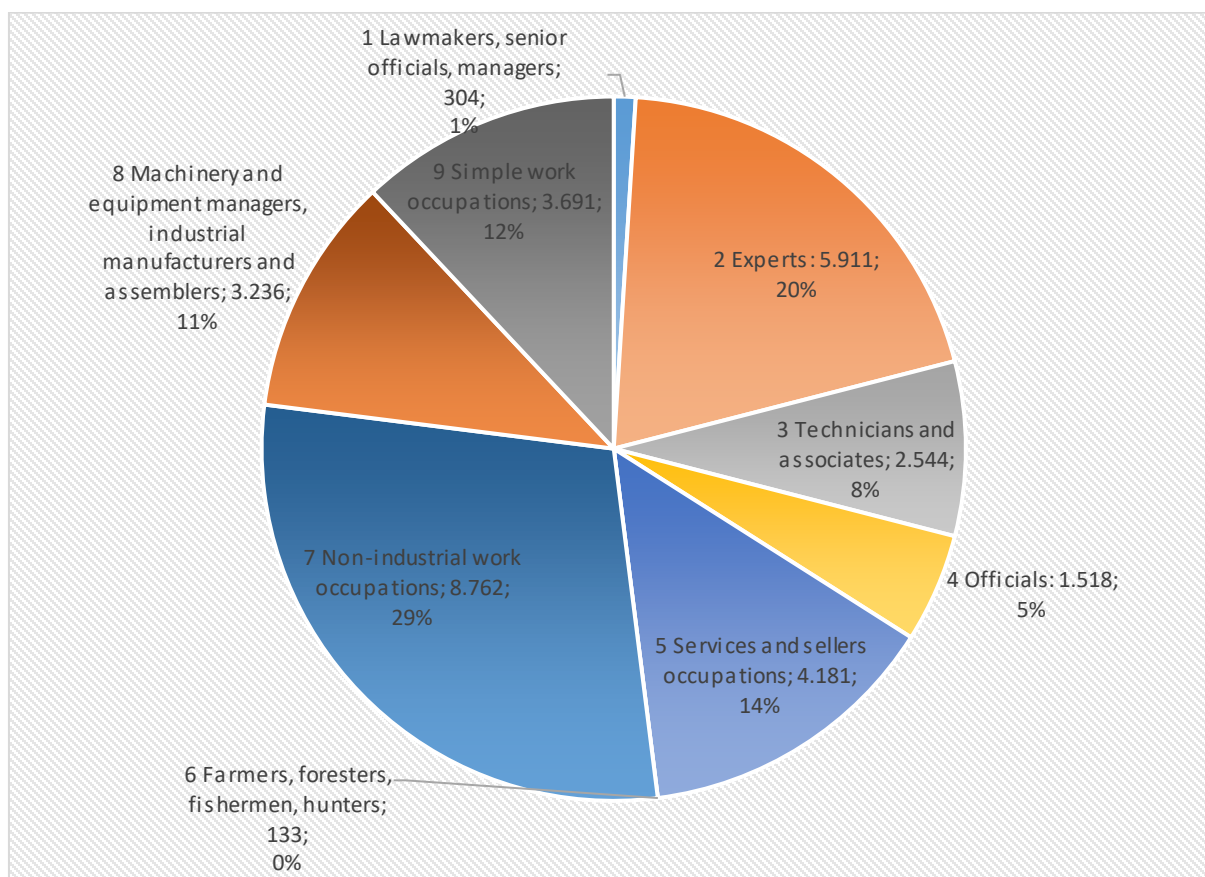


Figure 5. Distribution of announced jobs according to the main group of professions (source: anketa Napovednik zaposlovanja 2019/I)

c) Analysis of the unemployment of mechanical engineering technicians in Slovenia

In Slovenia, there are two aspects of keeping records of unemployment. We thus differentiate between the unemployment rate and the registered unemployment rate. The registered unemployment rate was 8.2% in 2018, this information is published by the Employment Service of Slovenia from the registered records. The survey unemployment rate was 4.4% in 2018, which is calculated according to the Labour Force Survey, which is published by SORS. It is evident from the tables below that the unemployment of the technicians is decreasing.

Table 2. Registered unemployed persons by level of education in 2018

	2019	%	index
1+2 - primary school or less	26.807	32,38	96,90
3+4 - lower, secondary vocational education	21.725	26,24	92,71
5 - intermediary technical, professional, general education	20.656	24,95	93,54
6 - higher education, first level	7.982	9,64	94,16
7 - higher education, second level	5.220	6,31	89,55
8 - higher education, third level (mag., dr.sc.)	401	0,48	92,82
Total	82.791		94,17

Table 3. Registered unemployed persons by level of education, monthly, 2018

Levels of education	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1+2 – primary school or less	27.6 66	27.0 10	25.1 99	24.1 91	23.7 49	23.2 30	23.1 23	23.0 09	22.9 61	23.2 94	23.5 60	25.1 04
3+4 – lower, secondary vocational education	23.4 33	22.8 65	21.4 39	20.6 09	20.0 51	19.6 00	19.6 51	19.5 78	19.1 74	19.3 35	19.3 85	20.2 55
5 – intermediary, technical, professional, general education	22.0 82	21.4 74	20.7 42	20.2 80	19.7 04	19.2 44	19.4 81	19.4 57	18.9 63	20.1 26	19.8 58	19.8 48
6+7+8 – higher education, first, second third level	14.7 38	14.3 34	13.8 40	13.4 75	13.2 01	12.9 14	13.7 96	13.8 76	12.6 83	13.4 77	13.2 96	13.3 27
Total	87.9 19	85.6 83	81.2 20	78.5 55	76.7 05	74.9 88	76.0 51	75.9 20	73.7 81	76.2 32	76.0 99	78.5 34

Table 4. Registered first job seekers at the Employment Service of Slovenia - secondary vocational, general education by years

Type of education	1.12.2016	1.12.2017	1.12.2018
Gymnasium	879	832	702

Economic technician	168	609	486
Preschool education	99	133	132
Computer technician	87	115	98
Media technician	85	82	77
Mechanical technician	99	77	65
Gastronomy-tourism technician	109	80	65
Classical Gymnasium	85	86	63
Economics vocational school	37	56	63
Cosmetic technician	67	64	62
Design technician	48	53	47
Technical vocational school	86	41	41
Tourist technician	39	72	40
Electrical engineer	63	52	37
Veterinary technician	36	35	36
Health care technician	42	23	35
Environmental technician	34	38	33
Electrical engin. and computing tech.	42	51	33
Logistic technician	34	57	30
Carpenter technician	33	31	29

III. Analysis of the current situation in Europe

By inspecting Eurostat statistics (<https://ec.europa.eu/eurostat>) it is not possible to find statistical data separately for the occupation of the mechanical engineering technician, but it is possible to search the data according to ISCO-08 (International Standard Classification of Occupations, 2008). According to this classification, the occupation of the mechanical engineering technician is included under a larger group of occupations, so-called Technicians and associate professionals under the code 31. Statistics for this group of occupations can be analysed for job vacancies and the number of employed workers.

a) Job vacancies for technicians and professional associates in the European Union

Job vacancies are not available for all European Union countries. In those countries where data are available, a relatively large number of job vacancies in 2018 can be seen for technicians and associate professionals. By the end of 2018, there are 1,917 vacancies in Bulgaria, 13,204 in Hungary, 5,865 in Romania and 1,172 in Northern Macedonia.

b) Number of employed workers - technicians and associate professionals in the European Union

When analysing statistical data for the number of employed workers in the occupations of technicians and professional associates, data for the whole European Union can be obtained. In 28 countries of the European Union, by the end of 2018, the total number of employed workers for occupations of technicians and associate professionals was 36,953. Also, it is possible to notice the trend of upward employment of almost 3% in the period from the end of 2016 to the end of 2018 (an increase from 35,889 to 36,953 employees). With more detailed insights into specific EU countries, it can be seen that in almost all countries between 2016 and 2018 there is a steady increase in the number of employed technicians and associate professionals. The exceptions are the five countries (Bulgaria, Latvia, Lithuania, Hungary and Austria) where there is a noticeable stagnation in the number of employed workers and a slight decrease in the number of employed workers – visible the most in Austria.

In addition, the German Employment Agency (www.arbeitsagentur.de) has published a list of deficit jobs that are open to workers outside the European Union, among which there are, among some other occupations, mechanical engineering technicians as one of the currently most deficit professions.

IV. Conclusions on the current situation in education, training and employment for Mechanical Engineering Technicians in Croatia and Slovenia

In conclusion, it can be said that the labour market situation is currently very favourable for the mechanical engineering technicians in most EU countries. In some EU countries there is a relatively high demand for experts from this area, and in most countries the number of employed workers is steadily increasing.

In Croatia, the labour market is currently extremely favourable for this occupation, at the same time the unemployment rate is very low, and the employment rate is very high. Also, employers show increased demand for this occupation and education policy is prescribing guidelines for increasing the number of enrolled students in related educational programs. There is a similar situation in Slovenia, there is many vacancies as well as the great interest of employers for that occupation.

All the above indicates that the interest for the mechanical engineering technicians is currently very much sought after in Croatia, Slovenia and most EU countries.

6. Concluding remarks and recommendations

This report presents an overview and insights in the qualifications frameworks of two countries and provides information about state-of-art in the process of occupational and qualifications standards development.

Based on the undertaken activities, the WP2 report presents a solid basis for next project activities, with the appropriateness of the choices and the possible limitations of activities that could be explained and argued.

Several main conclusions can be drawn based on the analysis and comparison of Slovenian and Croatian qualification frameworks and the process of occupational and qualifications standards development:

1. Regarding the normative framework, both countries have relevant documents, legal acts and regulations in which qualifications frameworks and the process of development of occupational and qualifications standards are prescribed and described in detail. Both qualification frameworks describe the relation of levels within the national framework with EQF and QF-EHEA levels.
2. Regarding the conceptual framework, similar constructs are used in both qualifications' frameworks (e.g., learning outcomes, competencies, knowledge, skills, key tasks), and they are described in detail in the existing documents, acts and regulations.
3. Regarding the implementation process and stakeholders, similar stakeholders are involved in the implementation process in both countries – i.e., ministries responsible for labour and education, elected sectoral councils, employers of the occupation for which the occupational standard is being developed. However, an important distinction is the role and function of CPI in Slovenia, for which a completely comparable institution does not exist in Croatia.
4. The main differences are evident in the implementation process, mainly related to the steps in the development of occupational standards and the methodology used in their development. In the Slovenian implementation process, the process of selection and elimination of proposed occupational standards is performed by sectoral councils at the first step, working groups are included in all the steps of the development, a flexible methodology of collecting the data from employers is used, and CPI is involved in the entire process. In the Croatian implementation process, the expert evaluation of proposed occupational standards by sectoral councils is performed at the end, an extensive survey with employers is incorporated in the process, and the methodology of development and validation of occupational standards is prescribed in detail.

Several recommendations can be drawn based on the comparison of strengths, weaknesses, opportunities and threats of experiences in both countries. Firstly, the methodology for the development of occupational and qualification standards should be clearly described, but at the same time designed flexibly to be applicable to occupations and qualifications of different types and levels. Secondly, steps in the implementation process as well as the inclusion of different stakeholders in the process should be envisioned and designed in such a way to ensure efficient and speedy completion of the desired outcomes. Thirdly, quality control mechanisms should be applied continuously in the implementation process for the final outcomes to be acceptable.

7. References

- Adalet McGowan, M. and D. Andrews (2015). Skill Mismatch and Public Policy in OECD Countries. OECD Economics Department Working Papers, No. 1205.
- Allen, J., and Van der Velden, R. (2001). Educational mismatches versus skill mismatches: effects on wages, job satisfaction, and on-the-job search. *Oxford economic papers*, 53(3), 434-452.
- Allen, J., M. Levels and van der Velden, R. (2013). Skill Mismatch and Skill Use in Developed Countries: Evidence from the PIAAC Study, Maastricht University, Research Centre for Education and the Labour Market Working Papers, No. 17.
- Araújo, S., and Maleček, P. (2015). Strengthening Skill use and School-to-work Transitions in the Czech Republic. OECD publication.
- Bacigalupo, M., Kampylis, P., Punie, Y., and Van den Brande, G. (2016). EntreComp: The entrepreneurship competence framework. Luxembourg: Publication Office of the European Union.
- Battu, H., Belfield, C. R., & Sloane, P. J. (1999). Overeducation among graduates: a cohort view. *Education economics*, 7(1), 21-38.
- Battu, H., C. Belfield, and Sloane, P. (2000). How Well Can We Measure Graduate Over-Education and its Effects?, *National Institute Economic Review*, Vol. 171, pp. 82-93.
- Büchel, F. (2002). The Effects of Overeducation on Productivity in Germany—the Firms' Viewpoint, *Economics of Education Review*, Vol. 21, pp. 263-275.
- CEDEFOP (2009). The development of national qualifications frameworks in Europe. Luxembourg: Publication Office of the European Union.
- CEDEFOP (2010). The Skill Matching Challenge: Analysing Skill Mismatch and Policy Implications. Luxembourg: Publication Office of the European Union.
- CEDEFOP (2013). Piloting a European Employer Survey on Skill Needs. Luxembourg: Publication Office of the European Union.
- CEDEFOP (2014). Analysis and overview of national qualifications framework developments in European countries. Luxembourg: Publication Office of the European Union.
- Chevalier, A. (2003). Measuring Over-Education, *Economica*, 70, pp. 509-531.
- Desjardins, R. and K. Rubenson (2011). An Analysis of Skill Mismatch Using Direct Measures of Skills", *OECD Education Working Papers*, No. 63.
- Dumont, J. C. and O. Monso (2007). Matching Educational Background and Employment: a Challenge for Immigrants in Host Countries, *International Migration Outlook*, pp. 131-159.
- Dželalija, M. (2007). Hrvatski kvalifikacijski okvir i cjeloživotno učenje. TEMPUS SCM – Furtherance of Bologna Promotion in Croatia II. Seminar, Sveučilište u Osijeku, 9. – 10- ožujka 2007.
- European Commission (2008). The European Qualifications Framework for Lifelong Learning.

European Commission (2013). ESCO: European Classification of Skills/Competences Qualifications and Occupations, 2013, [online] Available: <http://bookshop.europa.eu/en/esco-european-classification-of-skills-competences-qualifications-and-occupations-pbKE0313496>.

European Commission (2017). EntreComp: the entrepreneurship competence framework.

European e-Competence Framework 3.0: A common European Framework for ICT Professionals in all industry sectors. European Commission.

European Parliament & Council of the European Union (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning, Official Journal of the European Union, L 394(10).

Fernández-Sanz, L., Gómez-Pérez, J., & Castillo-Martínez, A. (2017). e-Skills Match: A framework for mapping and integrating the main skills, knowledge and competence standards and models for ICT occupations. *Computer Standards & Interfaces*, 51, 30-42.

Ferrari, A. (2013). DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe. Seville: European Commission, Joint Research Centre, Institute for Prospective Technological Studies.

Green, F., & Zhu, Y. (2010). Overqualification, job dissatisfaction, and increasing dispersion in the returns to graduate education. *Oxford economic papers*, 62(4), 740-763.

Hersch, J. (1991). Education match and job match. *The Review of Economics and Statistics*, 140-144.

Kremer, K., De Smedt, J. and Papantoniou, A. (2014). ESCO Mapping Pilot. Preliminary report on automatic mapping of NOC to ESCO.

Levels, M., R. van der Velden and Allen, J: (2014). Educational Mismatches and Skills: New Empirical Tests of Old Hypotheses, *Oxford Economic Papers*, 66(4), pp. 959-982.

Marsden, D., C. Lucifora, J. Oliver-Alonso and Guillotin, Y. (2002), *The Economic Costs of the Skills Gap in the EU*, Istituto per la Ricerca Sociale, Milan, Italy.

McGowan, M. A., & Andrews, D. (2015). Labour market mismatch and labour productivity. OECD publication.

McGuinness, S. and Ortiz, L. (2014). Who Should We Ask? Employer and Employee Perceptions of Skill Gaps within Firms, *ESRI Working Papers*, No. 482.

Ministarstvo rada i mirovinskoga sustava (2015). Metodologija za izradu i tumačenje profila sektora.

Ministarstvo rada i mirovinskoga sustava (2015). Smjernice za izradu standarda zanimanja.

Ministarstvo znanosti, obrazovanja i sporta (2015). Upute za izradu standarda kvalifikacija.

Mulder, M. (2017). Competence and the Alignment of Education and Work. In *Competence-based Vocational and Professional Education* (pp. 229-251). Springer, Cham.

Pelizzari, M. and Fichen, A. (2013). A New Measure of Skills Mismatch: Theory and Evidence from the Survey of Adult Skills (PIAAC), *OECD Social, Employment and Migration Working Papers*, No.153.

Pravilnik o Registru Hrvatskog kvalifikacijskog okvira (2014). *Narodne novine*, 62/2014.

Smjernice za vrednovanje prijedloga standarda zanimanja i skupova kompetencija, Ministarstvo rada i mirovinskog sustava.

Šavor, M., Magazin, B., Vrbanc, I. i Jelovica, V. (2016). Projektno izvješće „Daljnji razvoj standarda zanimanja. Zagreb: Hrvatski zavod za zapošljavanje.

Tijdens, K. G., De Ruijter, J., & De Ruijter, E. (2012). Measuring work activities and skill requirements of occupations: Experiences from a European pilot study with a web-survey. *European Journal of Training and Development*, 36(7), 751-763.

Verhaest, D. and E. Omeij (2006), "The Impact of Overeducation and its Measurement", *Social Indicators Research*, Vol. 77, pp. 419-448.

Vischer, J. C. (2007). The effects of the physical environment on job performance: towards a theoretical model of workspace stress. *Stress and Health: Journal of the International Society for the Investigation of Stress*, 23(3), 175-184.

Weiß, J., & Schuck, B. (2016). First Findings from Employer Interviews. CUPESSSE project report.

Winterton, J. (2011). Competence in European policy instruments: A moving target for developing a National Qualifications Framework?. *Journal of Contemporary Educational Studies/Sodobna Pedagogika*, 62(5).

Winterton, J. (2017). IHRD: international perspectives on competence and competencies: Context, Processes and People. In *Handbook of International Human Resource Development*. Edward Elgar Publishing.

Zakon o Hrvatskom kvalifikacijskom okviru (2013). *Narodne novine*, broj 22/2013.

EACEA - National Qualifications Framework (2019, February 8). Retrieved from https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-77_en

Slovenian Qualifications Framework (2019, February 8). Retrieved from <https://www.nok.si/en>

Mikulec, B., & Ermenc, K. S. (2016). Qualifications Frameworks Between Global and European Pressures and Local Responses. *SAGE Open*, 6(2), DOI: 2158244016644948.

CEDEFOP (European Centre for the Development of Vocational Training). (2009). The shift to learning outcomes: Policies and practices in Europe. Luxembourg: Office for Official Publications of the European Communities.