SLOVENSKO
OGRODJE
KVALIFIKACIJ

REPORT

ON THE PILOT MAPPING

OF SQF QUALIFICATIONS AND

ESCO OCCUPATION DESCRIPTIONS

Prepared by: Nejc Jensterle

Ljubljana, January 2020

Contents

Introduction

In the context of the Databases and registers for qualifications (EQF-NCPs) VP/2017/016 project, we started pilot mapping the Slovenian Qualifications Framework qualifications descriptions and ESCO's Occupations pillar descriptions to evaluate Slovenian qualifications and ESCO description comparability, particularly in terms of how this this could be achieved. We wanted to see, with CEDFOP and European Commission methodological support, if Slovenian qualifications could be aligned with ESCO's knowledge, skills and competences, which would enable comparability with ESCO's occupations.

1. The Slovenian Qualifications Framework

The Slovenian Qualifications Framework (SQF) is a unified system to classify qualifications into levels based on learning outcomes in Slovenia. It consists of **10 levels**.

SQF is intended for everyone who wants to learn about the wide range of education and qualifications in Slovenia, as well as check comparability of various qualifications. Moreover, the SQF can be used to check the European Qualifications Framework (EQF) level or the Qualifications Framework in the European Higher Education Area (QF-EHEA) level that your education or qualification falls into.

The Slovenian Qualifications Framework includes three categories of qualifications: educational qualifications, vocational qualifications, including the National Vocational Qualifications, and supplementary qualifications.

2. What is ESCO?

We will briefly present ESCO and its basic structure.

ESCO is the multilingual classification of European Skills, Competences, Qualifications and Occupations. The ESCO classification identifies and categorises skills, competences, qualifications and occupations relevant for the European labour market and education and training.

The Commission has developed ESCO with the following aims:

- · to improve the communication between the education and training sector and the EU labour market;

- · to support geographical and occupational mobility in Europe;

- · to make data more transparent and easily available for use by various stakeholders, such as public employment services, statistical organisations and education organisations;

- · to facilitate the exchange of data between employers, education providers and job seekers irrespective of language or country;

- · to support evidence-based policy making by enhancing the collection, comparison and dissemination of data in skills intelligence and statistical tools, and enabling better analysis of skills supply and demand in real-time based on big data.

ESCO is organised in three pillars:

- · the occupations pillar;

- · the knowledge, skills and competences pillar;

- · the qualifications pillar.

Overall, this three-layered structured approach allows ESCO to organise terminology for the European labour market and the education/training sector in a consistent, transparent and usable way.

(Source: European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Directorate E, *ESCO handbook: European Skills, Competences, Qualifications and Occupations*, European Union, 2019, pg. 10-11.)

Knowledge, skills and competences are essential and optional. Essential are those knowledge, skills and competences "that are usually relevant for an occupation, independent of the work context, employer or country. Optional are those knowledge, skills and competences that may be relevant or occur when working in an occupation, depending on the employer, working context or country.

Optional knowledge, skills and competences are very important for job-matching because they reflect the diversity of jobs within the same occupation."[1]

3. Methodological mapping approach and results

The majority of the mapping was performed between October and December 2019 at workshops for each individual mapping field. Mapping involved the cooperation of experts in the fields of catering (Srečko Koklič), hairdressing (Tomaž Turk) and cosmetics (Kati Grom, Mojca Janežič, Petra Keršmanc, and Janja Jeršin). We determined the qualifications and occupational standards for each group to map and compare them with ESCO's occupation descriptions. The basis for the mapping table was the table used by CEDEFOP to compare car mechanic qualifications. CEDEFOP expert Ms Slava Pevec Grm, MSc, joined us at the first and final workshops and provided advice in terms of methodological mapping approach.

As evidenced below, it is not entirely evident that ESCO's occupations can be used to compare Slovenian qualifications from the Slovenian Qualifications Framework.[2] In the majority of cases, we took an occupation whose name matched the compared qualification and this provided basic comparison criterion because ESCO's occupation descriptions are not classified into levels but in terms of ISCO occupation classification. Problems arise when we consider SQF qualifications from the same field but of different category, such as educational qualification, NVQs and supplementary qualification. Should we, in this case, compare everything to the same occupation? We did this and it pointed out the difference between the different qualifications and ESCO's knowledge, skills and competences.

ESCO's occupation description knowledge, skills and competences include cross-sector or transversal skills which, as the name states, are applicable to different fields. Since they are not strictly related to one occupation, differences may occur when comparing them with Slovenian qualifications if the qualification and ESCO occupation do not include the same cross-sector skills.

Another methodological problem that arose prior to mapping is related to qualification structure and ESCO occupation descriptions. ESCO occupation descriptions are categorised as *Essential skills and competences, Essential knowledge, Optional Skills and competences,* and *Optional knowledge*, and there is no criterion as to which knowledge, skill or competence falls into which category; moreover, it is not necessary that a description includes all of these categories, it can, for example, have only two or three. We needed criteria from one of ESCO's categories to attribute value to the relevant Slovenian skill, learning outcome, competence or knowledge. Is matching more valuable if it matches an essential skill or knowledge? What should we do if a Slovenian qualification, skill or competence is determined optional and subject-specific? Another problem is that the Slovenian Qualifications Framework has various qualifications at different levels and each has a different distribution of learning outcomes. For example, national vocational qualifications are based

on an occupational standard and unified learning outcomes, such as higher education qualifications having general and subject-specific competences, secondary school qualifications having essential and optional competences.

For the above-mentioned reasons, it was difficult to determine a unified methodology prior to mapping that would consistently, professionally equivalently compare the SQF and ESCO systems, which are different in basis, objectives and goals. Our pilot mapping was predominantly research in nature. For this reason, we used a mixed methodology and compared specific feature separately. We compared various types of qualifications[3] at different levels using different descriptions. We compared learning outcomes and groups of key tasks of the occupational standard, that is the basis for the qualification, or all individual skills and knowledge from the occupational standard with ESCO's occupation skills, competences and knowledge. We will use this to present a model that allows for a comprehensive comparison of a larger sample of qualifications from SQF and ESCO, or some other system.

The table below formed the basis for mapping; on the left side, it includes SQF qualifications or occupational standards, followed by key tasks, individual skills, and knowledge or learning outcomes for the qualification; on the right side, ESCO occupation with knowledge, skills and competences categorised in terms of essential or optional. Between these descriptions are fields in which experts state which learning outcomes, that is, the SQF qualification knowledge, skills or competences match ESCO's knowledge, skills and competences; experts also had the opportunity to state whether any ESCO knowledge, skill or competence was not present in an SQF qualification. Under individual skills and knowledge or learning outcome, experts suggest which ESCO knowledge, skills and competences should be included in the Slovenian description.

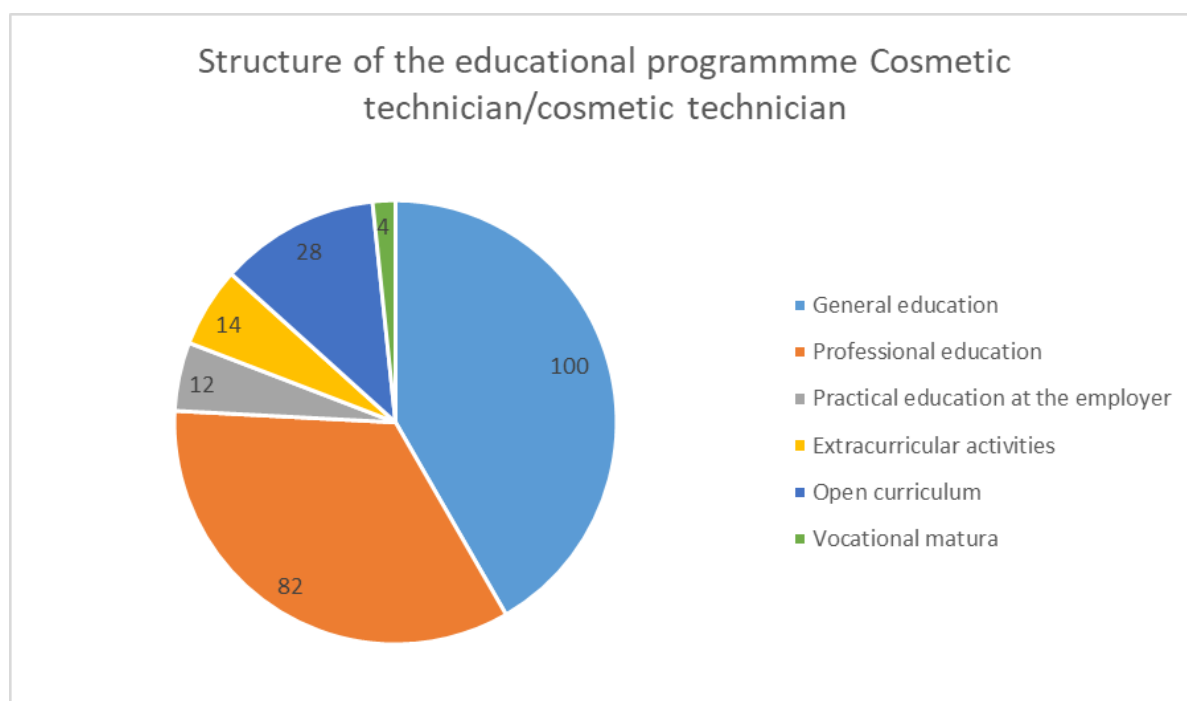|	A	B	C	D	E	F	G	H
1								
2			Kozmetični tehnik/kozmetična tehnica					
3							ESCO	
4		SOK						
5								
6		Kozmetik/kozmetičarka (5141.03)					ESCO poklic kozmetik/kozmetičarka	
7				Vsebovano v ESCO poklicu: D/N (da/ne) + št. ESCO kompetence (lahko se tudi ponovi)	ESCO spretnost, ki je ni v SOK (X)			
8		Ključna dela	Spretnosti in znanja				Bistvene spretnosti in kompetence	Opis
9	1	organizira delovni proces in uporabniku predstavi storitev				1	delati v skladu z načeli ergonomije	Apply ergonomy principles in the organisation of the workplace while manually handling equipment and materials.
10	1_1		organizira delovni proces			2	določiti tip kože	Determine what type of skin a person has in order to use the right make-up for that particular skin type.
11	1_2		predstavi storitve in se uskladi z uporabniku glede kozmetične storitve za nego kože	D1, D31		3	izvajati nego obraza	Perform all kinds of treatments to improve the health and attractiveness of the facial skin, such as facial masks, scrubs, eyebrow tinting, peels, hair removal and make-up.
12	2	izdela terminski plan in pripravi delovno mesto		D7, D33		4	izvajati povijanje telesa	Wrap customers with plastic, mud or thermal blankets for de-stressing, rebalancing, firming skin, detoxicating and reducing cellulite.

Based on the completed tables, we analysed matching: analysis is divided into fields and presented below.

3.1.   Cosmetology

Cosmetic technician: education, SQF 5/EQF 4

In the case of cosmetic technician qualification mapping, we compared the qualifications skills and knowledge with those of ESCO's aesthetician occupation. The problem that occurred in the mapping of such an educational qualification based on several occupational standards is that it needs to be compared with several ESCO occupations. The cosmetic technician programme resulting in the cosmetic technician qualification at SQF 5/EQF 4 level covers the fields of *somatology, skin and skin diseases, healthcare, general cosmetology, cosmetic products, cosmetic facial care, cosmetic body care, entrepreneurship, make-up, manicure, pedicure and massage*, and is based on the following occupational standards: Manicurist, Make-up artist, Aesthetician, Pedicurist, Masseur/masseuse; moreover, almost a half of the programme is intended for general education subjects,[4] not only professional subjects. Due to these specific features of the Slovenian education system, we will present the matching results for the occupational standard Aesthetician (5141.03), one of the cosmetic technician qualification standards, and highlight the differences to ESCO's description of the knowledge and skills for an aesthetician.

The graph below shows Cosmetic technician education programme ratios based on number of credits, whereby 1 credit means 25 hours of candidate work:

Structure of the educational programmme Cosmetic technician/cosmetic technician

- General education
- Professional education
- Practical education at the employer
- Extracurricular activities
- Open curriculum
- Vocational matura

Aesthetician (5141.03)

We compared Slovenia's occupational standard Cosmetician (5141.03) with ESCO's occupation Aesthetician. The occupational standard Cosmetician (5141.03) consists of 17 groups of key tasks and 119 individual skills and knowledge categorised in terms of field of work.

ESCO's description of the Aesthetician occupation consists of a total of 41 individual listed knowledge, skills and competences, of which 11 are essential skills and competences, 5 essential types of knowledge, 22 optional skills and competences, and 3 optional types of knowledge.

Structure of the occupational standard Cosmetician (5141.03) by number of individual skills and knowledge types by groups of key tasks
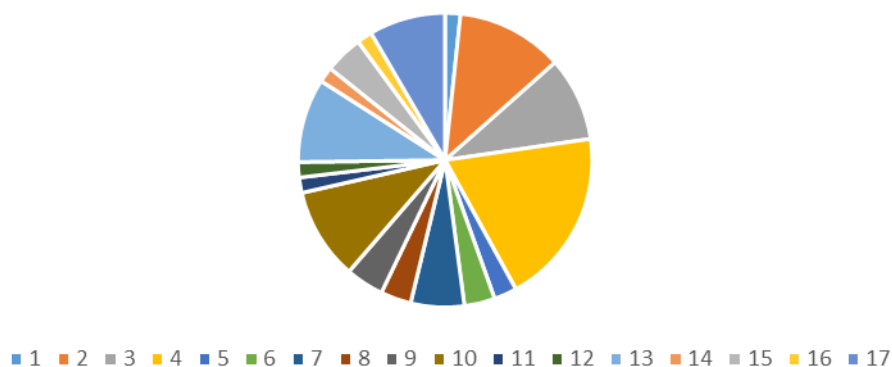
■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ 10 ■ 11 ■ 12 ■ 13 ■ 14 ■ 15 ■ 16 ■ 17

The structure of the ESCO description of the occupation Aesthetician

■ Essential skills and competences ■ Essential knowledge
■ Optional skills and competences ■ Optional knowledge
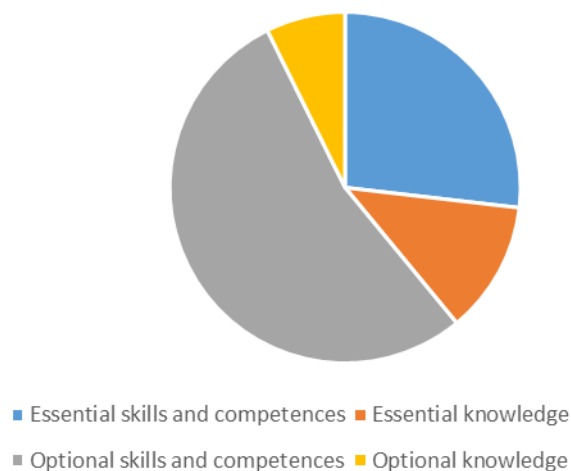
In terms of the Slovenian occupational standard, a matching of skills, competences and knowledge of ESCO's description could not be made for 15 of the 119 individual skills and knowledge of the occupational standard[5], so matching was 87.4%.

Of the matching skills and knowledge, 46 matches at least one essential skill, competence or knowledge in ESCO's description, so matching was 44.2%.

In terms of the ESCO's description of the occupation of Aesthetician, a matching skill or knowledge type could not be found for 14 of the 41 individual skills, competences or knowledge in the Slovenian occupational standard,

so matching of the entire description was 65.9%; of this, a matching skill or knowledge could not be found for 3 of the 11 essential skills and competences, so matching was 72.3%; all essential knowledge matched 100%; 8 out of 22 optional skills and competences could not be found in the Slovenian occupational standard, so matching was 63.6%; none of the optional knowledge matched any skill or knowledge in the Slovenian occupational standard, so matching was 0%.
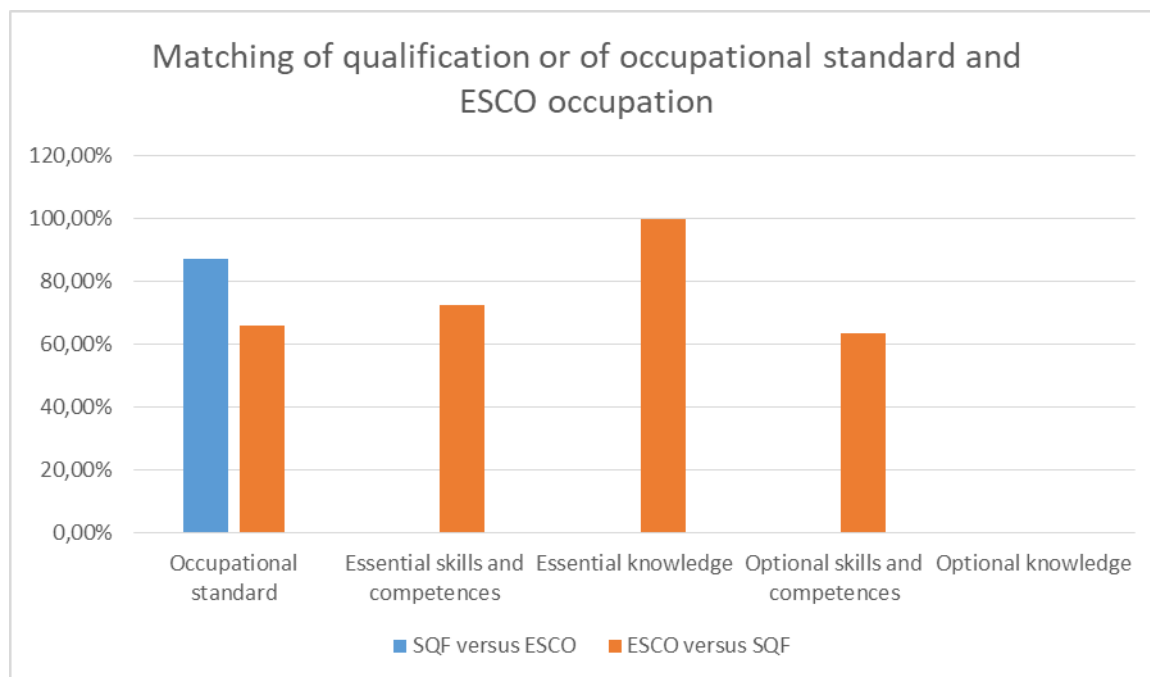

The general finding was that the Cosmetic technician qualification is much broader than the knowledge, skills and competences defined by ESCO for the occupation Aesthetician, so it should be compared with several ESCO occupations.

We also noted that certain skills and knowledge required several ESCO knowledge, skills and competences to enable better matching. On the one hand, this shows that certain Slovenian qualification skills and knowledge types are set more broadly than ESCO's and include several learning outcomes, while other ESCO skills, competences and knowledge types are more general.

Higher cosmetician; education, SQF 6/EQF 5

An expert in the field compared short cycle higher vocational education's Higher Cosmetician with the ESCO's description of an Aesthetician, as in the

previous case; we compared the Higher Cosmetician qualification's learning outcomes: 16 general competences and 14 subject-specific competences; ESCO's description of an Aesthetician includes 41 skills, competences and knowledge, of which 11 are essential skills and competences, 5 essential knowledge, 22 optional skills and competences, and 3 optional knowledge.

Structure of learning outcomes of the qualification Higher cosmetician

- General competences
- Subject-specific competences

Structure of skills, competences and knowledge of ESCO's description of the occupation Aesthetician

- Essential skills and competences
- Optional skills and competences
- Essential knowledge
- Optional knowledge
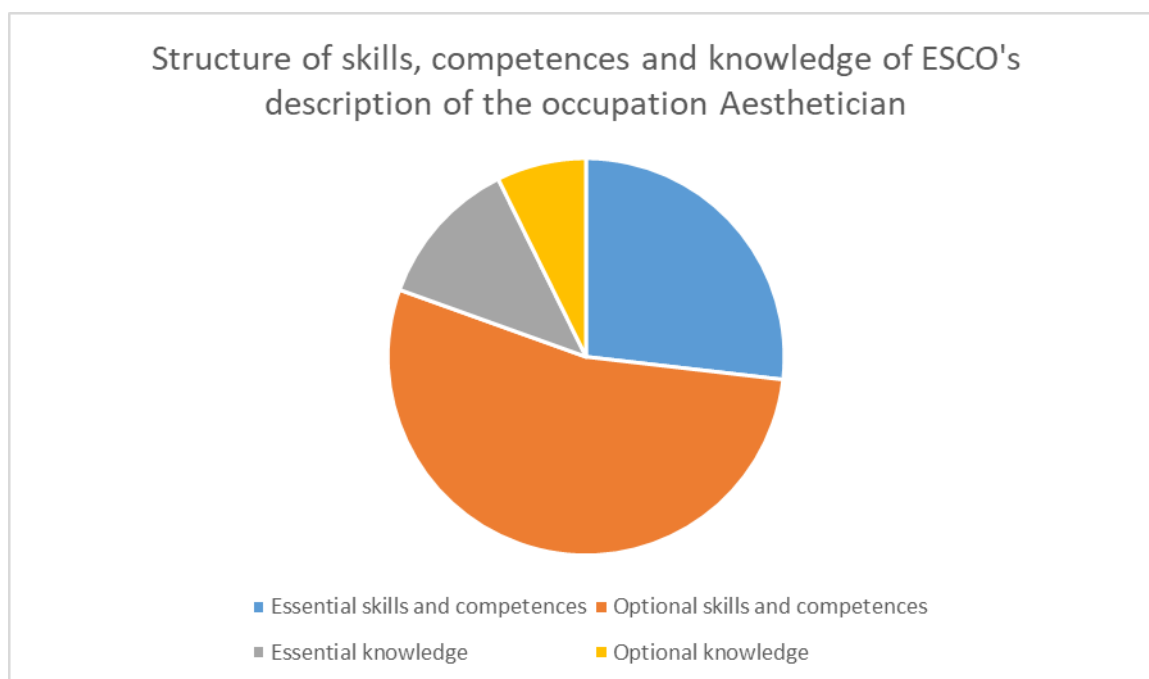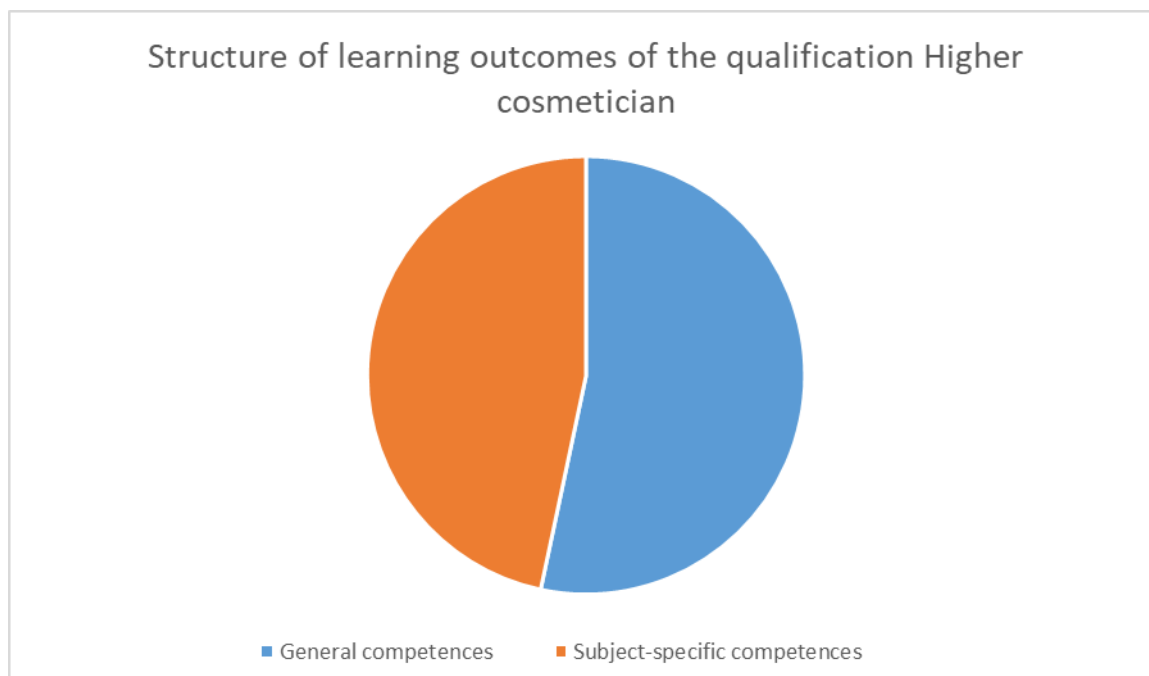
The expert who mapped this qualification with ESCO's occupation description could not find a matching ESCO description for 9 general[6] and 4 subject-specific[7] competences, in fact 56.3% of general and 28.6% of subject-specific competences cannot be found in ESCO's description. Once again, we see

the difference between the breadth of Slovenia's qualifications and ESCO's occupation descriptions in terms of the greater breadth of Slovenia's qualifications. Another problem is that ESCO does not determine levels, which is particularly evident when comparing higher level qualifications, such as this one. We also expected that subject-specific learning outcomes would be better matched than general ones because ESCO's descriptions are more oriented towards knowledge, skills, competences and tasks of an occupation than graduation of a qualification description from a lower to a higher level.

General competence matching was 31.3%, subject-specific 71.4%, and entire qualification 56.7%; 8 out of 17 Higher Cosmetician qualification learning outcomes matched at least one essential skill, competence or knowledge, evidencing a 47.1% match.
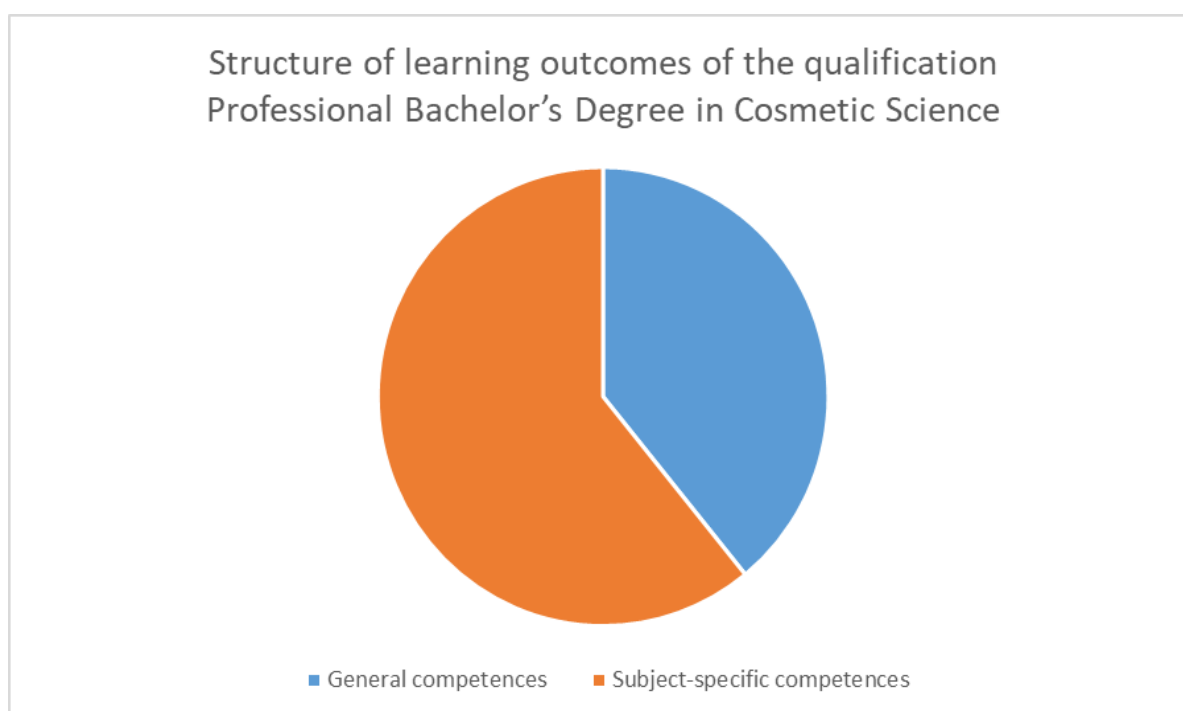
In terms of ESCO's description of an Aesthetician, 11 skills, competences or knowledge types cannot be attributed to any Slovenian qualification learning outcome[8]; of this, 4 out of 5 essential knowledge types, 5 optional skills and competences, and zero out of 3 optional knowledge types do not match any SQF learning outcome; all essential skills and competences match completely, essential and optional knowledge at rates of 20% and 0% respectively, and optional skills and competences at 77.3%; in terms of the entire ESCO's description, matching is 73.2%.
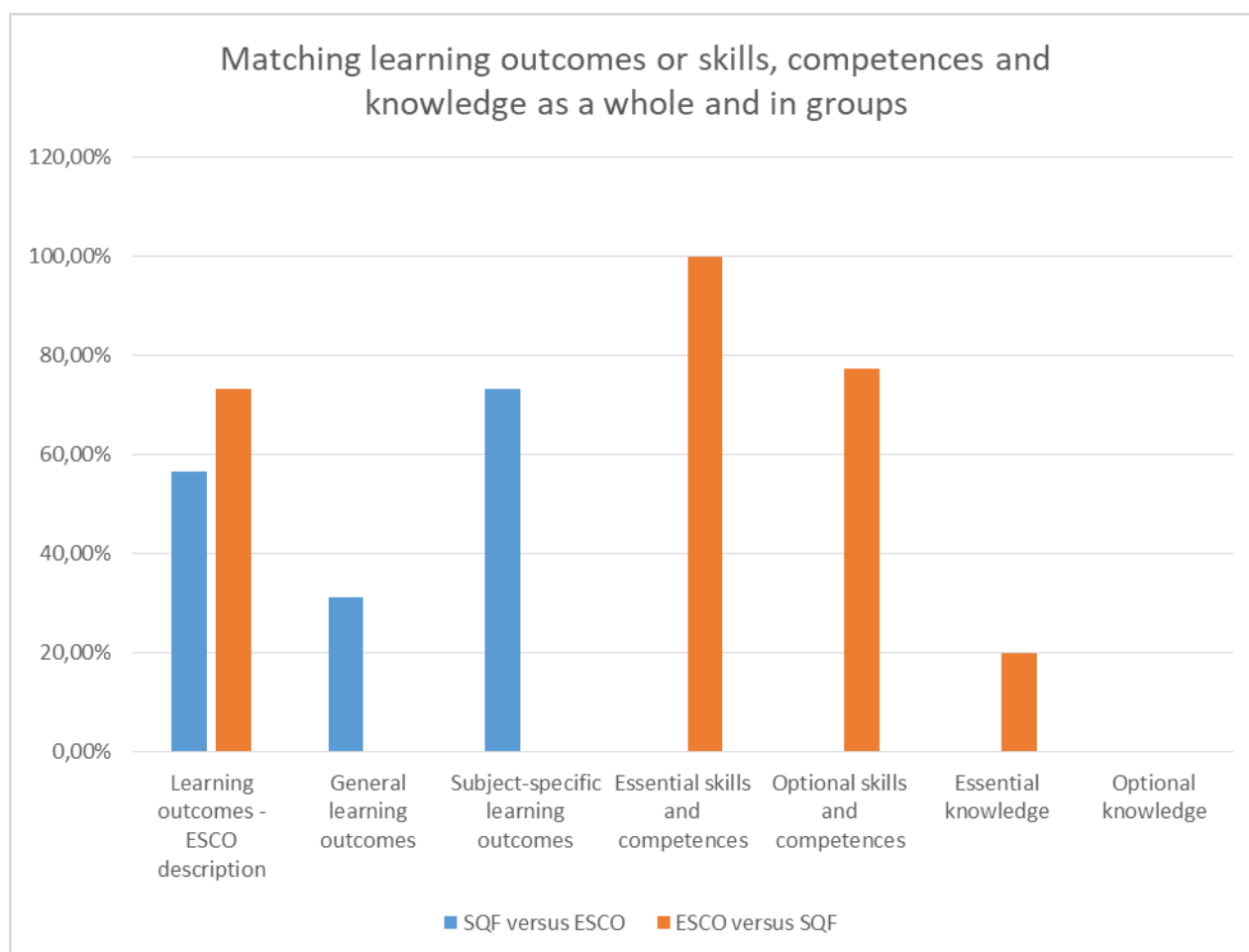
Differences in results will occur because we used different methods to establish which delivers the best results for larger scale testing.
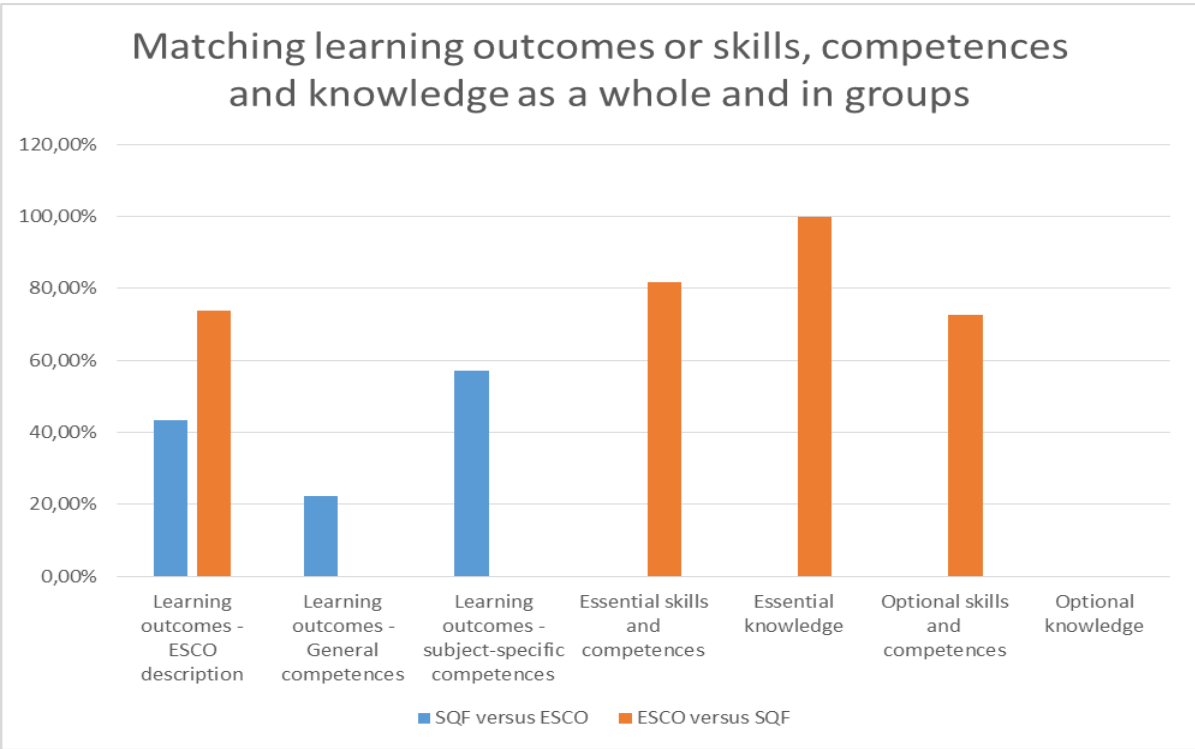
Professional Bachelor's Degree in Cosmetic Science: education, SQF 7/EQF 6

We chose a first cycle higher education qualification, the professional Bachelor's Degree in Cosmetic Science, consisting of 9 general competences and 14 subject-specific competences, and compared this SQF qualification with ESCO's description of an Aesthetician, which includes 41 skills, competences and knowledge types, of which 11 are essential skills and competences, 5 essential knowledge, 22 optional skills and competences, and 3 optional competences. Compared to the previous qualification, we may evidence a difference between national qualification mapping at various levels and the same ESCO's occupation description and different matching levels because of differences in the descriptor's level.

Structure of learning outcomes of the qualification
Professional Bachelor's Degree in Cosmetic Science

■ General competences   ■ Subject-specific competences

Structure of skills, competences and knowledge of ESCO's description of the occupation Aesthetician

- Essential skills and competences
- Optional skills and competences
- Essential knowledge
- Optional knowledge

In terms of the SQF qualification, 7 out of 9 general competences[9] could not be attributed to any ESCO description of knowledge, skill or competences: matching was only 22.2%. 6 out of 14 subject-specific competences could not be attributed to ESCO's description[10], with a match of 57.1%. A higher match was observed in relation to subject-specific outcomes than in general ones, for presumably the same reasons. Looking at all of learning outcomes, 13 out of 23 could not be attributed to any ESCO description, and the match was 43.5%.

Matching learning outcomes or skills, competences and knowledge as a whole and in groups

- SQF versus ESCO
- ESCO versus SQF

5 of 10 matching learning outcomes[11] matched at least one essential skill, competence or knowledge from ESCO's description of an Aesthetician, a 50% match; in terms of ESCO's description of an Aesthetician, 2 out of 11 essential skills and competences could not be attributed to any SQF learning outcome, resulting in an 81.8% match; all essential knowledge for ESCO's Aesthetician could be attributed to SQF's, a 100% match; whereas, 6 out of 22 optional skills and competences could not be attributed to the Slovenian qualification, a 72.7% match; in terms of optional knowledge, there is no match; in total, there is 73.2% matching.
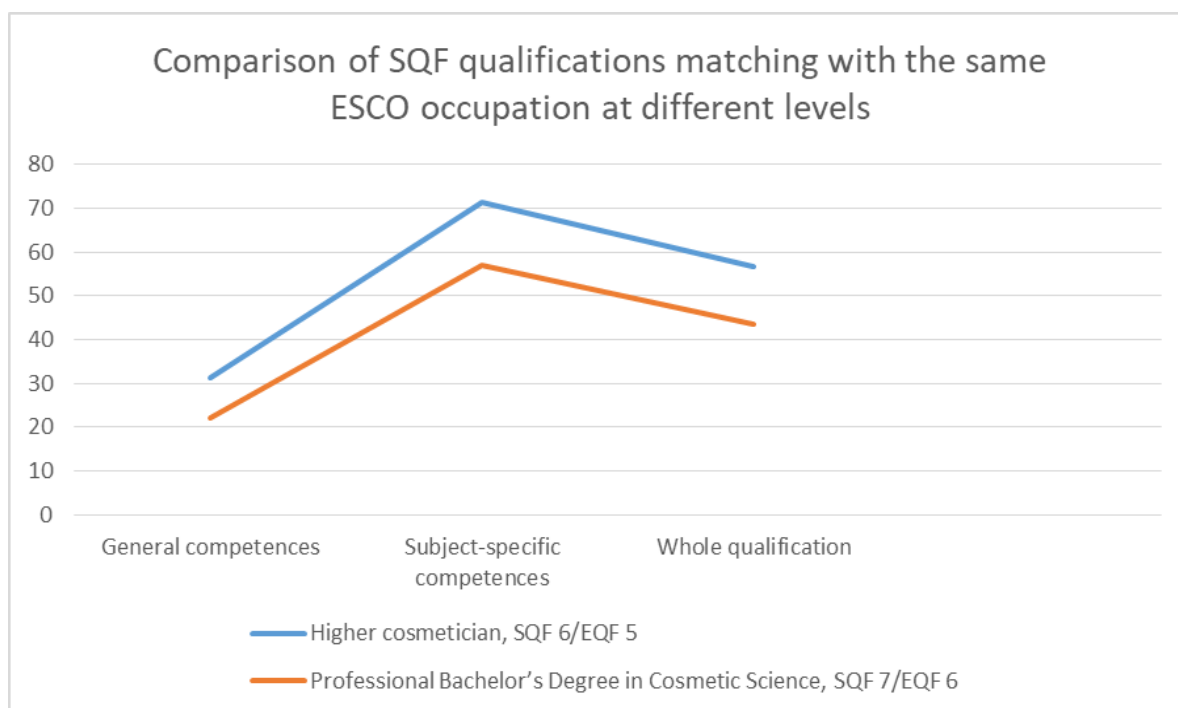
Manicurist; vocational qualification, SQF 4 / EQF 4

Comparison was made between the key tasks, skills and knowledge of the Manicurist occupational standard (5141.05), the basis for the Manicurist national vocational qualification, and ESCO's description of the occupation of Manicurist. The Manicurist occupational standard (5141.05) consists of 12 groups of key tasks and 133 individual skills and knowledge types; ESCO's description of a Manicurist is comprised of 35 skills, competences and knowledge types, of which 11 are essential skills and competences, 5 essential types of knowledge, and 19 optional skills and knowledge types.

In terms of SQF, 24 skills and knowledge types matched ESCO's description, with an 18% match; some sets of key tasks did not match any ESCO skills or knowledge types; in terms of the skills and knowledge types, 19 out of 24 cases matched, a 79.1% match.

In terms of ESCO's description, 5 out of 11 essential skills and knowledge types[12] did not match the Slovenian description, a 54.5% match; 1 out of 5 essential knowledge types did not match the Slovenian qualification, an 80% match; moreover, 12 out of 19 optional skills and knowledge types did not match the selected SQF qualification, a match being 36.8%; the match for the entire ESCO description was 48.6%.

In this case, we cannot overlook the big difference between the number of skills and knowledge types from the Slovenian occupational standard and the number of skills, competences and knowledge types from ESCO's occupation description; low matching resulted from the fact that the Slovenian qualification is broader, containing sets that are not included in ESCO, such as the key task sets of 'performing special hand care', 'extending, strengthening and modelling gel-system nails', 'marketing the service', 'ensuring high quality of performed service and work and being responsible for it'.

On the one hand, it would be reasonable to use skills, knowledge and key tasks from Slovenian occupational standards for comparison or mapping, as occupational standards are the basis for SQF qualifications, that is, they are the direct basis for the NVQ included in the education standard for vocational and technical education, including higher education. This would provide us with a possibility for multiple use of the mapped occupational standard. By mapping an occupational standard with an ESCO occupation description, we could map qualifications based on several occupational standards with those from ESCO to easier connect a certain educational qualification with several ESCO occupations because Slovenian vocational educations are broader and include more ESCO occupations. On the other hand, it is because of the breadth of certain occupational standards that they by far exceed their matching with the similarly named ESCO occupation, and this could make further comparison of Slovenia's qualifications' occupational standards with ESCO's occupation descriptions impossible. It would make sense to compare occupational standards by key task sets and their matching with the relevant ESCO occupations; and on this basis include already mapped occupational standards and assess matching at the learning outcome level.

3.2. Hairdressing

Hairdresser: education, SQF4 / EQF 4

In the field of hairdressing, we compared the occupational standard Hairdresser (5141.02), which is the basis for the Hairdresser and Master Hairdresser programmes with ESCO's Hairdresser. In relation to the Hairdresser occupa-

tional standard, we compared all key tasks, relevant skills and knowledge types with ESCO's skills, competences and knowledge types.

The graph below shows Hairdresser education programme ratios based on number of credits, whereby 1 credit equals 25 hours of candidate work:
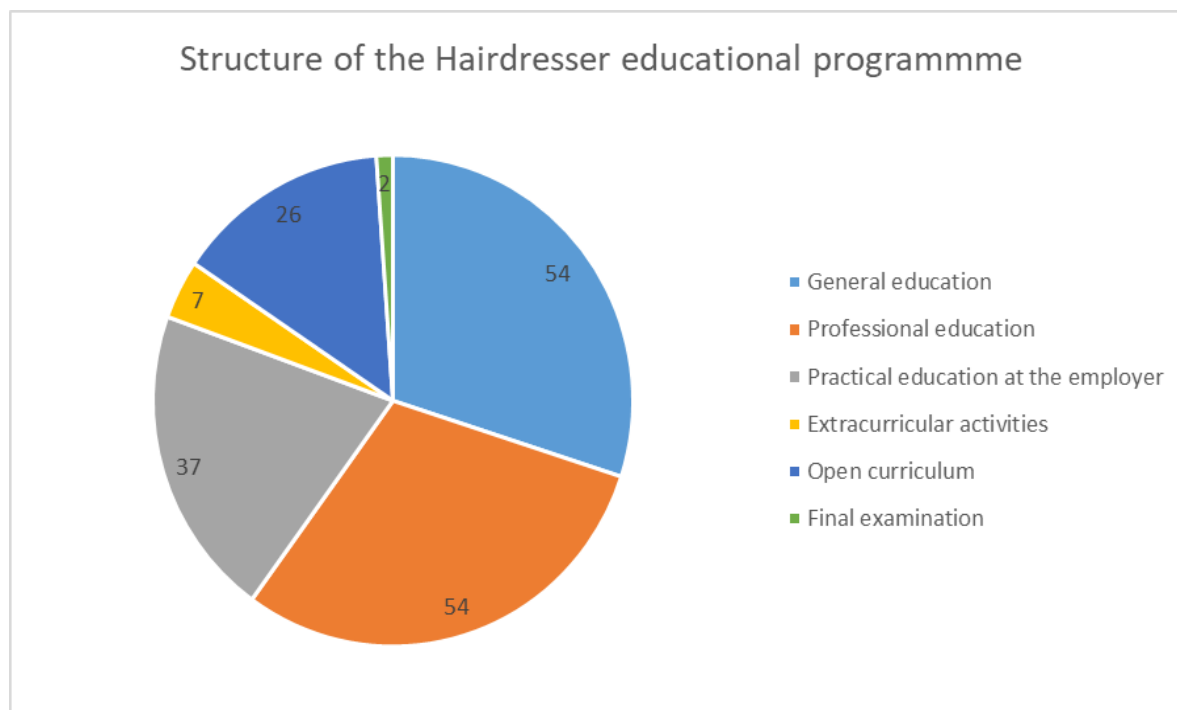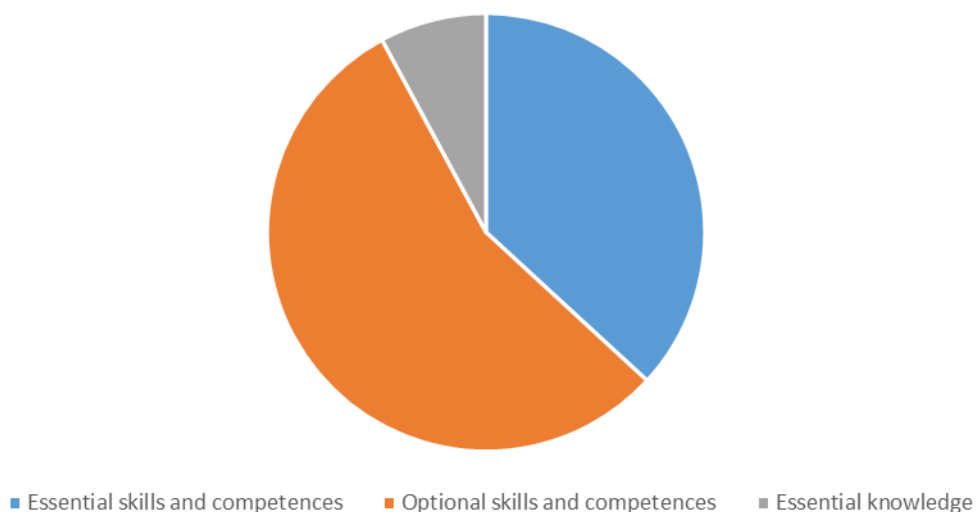

The occupational standard Hairdresser (5141.02) is comprised of 14 groups of key tasks and a total of 65 individual skills and knowledge types; ESCO's description of the occupation is comprised of 35 individual skills and competences, 14 of which are essential, 21 optional and 3 essential knowledge types.

Structure of the occupational standard Hairdresser (5141.02) by number of individual skills and knowledge by groups of key tasks

1 2 3 4 5 6 7 8 9 10 11 12 13 14
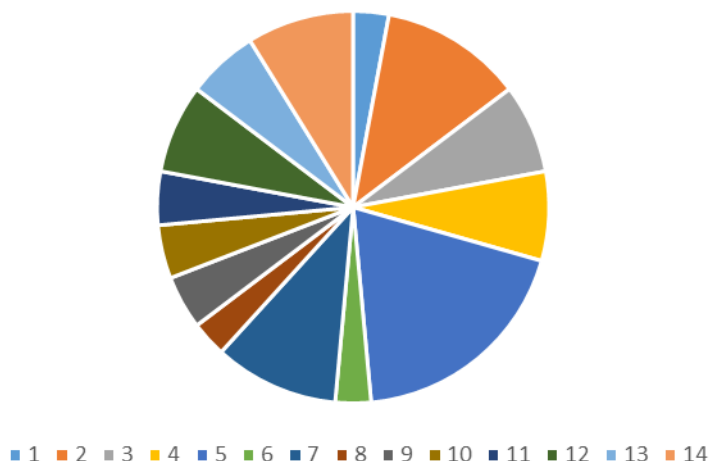
Structure of the ESCO description of the occupation hairdresser

■ Essential skills and competences   ■ Optional skills and competences   ■ Essential knowledge

When mapping the Hairdresser occupational standard (5141.02), an expert in the field found matching with 23 of ESCO's skills, competences and knowledge types, of which 14 are essential skills, competences and knowledge types, with 11 of the 14 essential skills and competences and all 3 essential knowledge types matching the Slovenian occupational standard. Out of 21 optional skills and competences, the expert was unable to attribute matching to 12 in the Slovenian standard; 57% of optional skills and competences from ESCO's description do not match the Slovenian standard; the match for essential skills, competences and knowledge type is 82.4%.

In terms of the Slovenian standard, the expert was unable to find suitable pairs in ESCO's description for 37 skills and knowledge types, so matching with the entire occupational standard was 43.1%. Here, it needs to be emphasised that such low matching in terms of the Slovenian occupational standard is a result of the Slovenian standard being set more broadly than ESCO's occupation. ESCO's description of occupation barely mentions 'personal and work place preparation', 'creates and shapes hair products' and 'takes care of own safety and safety of clients and protects health and environment' when compared with the Slovenian standard; discounting these three groups gives us matching of 57.1%.
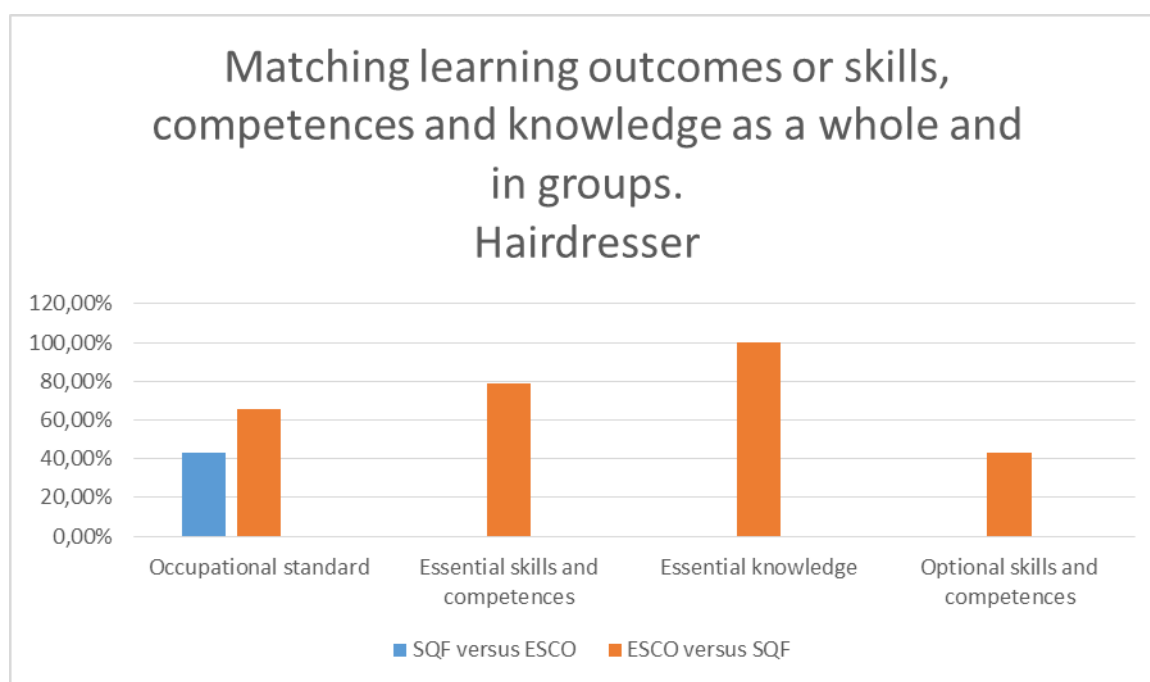
Moreover, 16 out of 28 skills and knowledge types from the Slovenian standard match at least one essential skill, competence or knowledge type, totalling 57.1%.

Tomaž Turk, the expert in the field who mapped hairdressing provided the following observations in terms of mapping the Slovenian qualification and ESCO occupation:

"The major emphases and knowledge obtained by students in Slovenia not included in ESCO are:

- how to prepare and protect yourself, especially in terms of hygiene and procedures;
- personal hygiene and room cleanliness, familiarity with hygiene regulations, and types of hair and scalp infection and disease;
- preparation and use of disinfectants;
- familiarity with occupational health and safety, and relevant regulations;

- familiarity with the use, storage and cleanliness of devices and preparations;
- accepting clients and preparing styling plan;
- performing various types of scalp massage techniques and hair care;
- dosing preparation and using them ecologically;
- knowledge of the differences between wet and dry hair, and substantial in-depth knowledge of various types of combing, tying, cutting, colour changing and hair prepping;
- knowledge, use and preparation of hair products;
- emphasis on communication in expert teams with co-workers and clients;
- communication in a foreign language; and
- ability to self-assess and act in accordance with professional ethics.

ESCO highlights:

- processing payments, cards, vouchers, membership benefits, and secure use thereof;
- hairstyling with the help of creative leaders;
- maintain relationships with suppliers, communication and cooperation;
- disassembling products, offer, special deals and arranging displays;
- selling different types of hair products;
- advising on the use of hair products at home;
- financially and organisationally managing a small or medium size enterprise;
- training, managing and teaching employees about the system in the salon.

Master hairdresser: education, SQF 5/EQF 4

In this expert field, we compared learning outcomes for the Slovenian qualification of Master Hairdresser, the basis for which is the corresponding occupational standard, which we also compared with ESCO's description of a Hairdresser, because ESCO does not provide a description of a Master Hairdresser.

The Slovenian qualification includes 14 learning outcomes, of which an expert in the field was unable to match three skills, competences or knowledge types with ESCO's description of Hairdresser[13], a matching of 78.6%; 6 out of 11 matched learning outcomes were related to ESCO's essential skills, competences or knowledge types, evidencing a 54.5% match. In terms of ESCO's description of Hairdresser, 18 out of 38 skills, competences and knowledge types could not be related to Slovenian qualification learning outcomes, evidencing a 52.6% matching in terms of ESCO's entire description of the occupation, of which 6 out of 14 essential skills and competencies could not be matched with learning outcomes, a 57.1% match; likewise, 2 out of 3 essential

knowledge types could not be matched with Slovenian learning outcomes, a match equalling 33.3%; 10 out of 21 optional skills and competences could not be matched with the Slovenian qualifications' learning outcomes, a match of 52.4%.
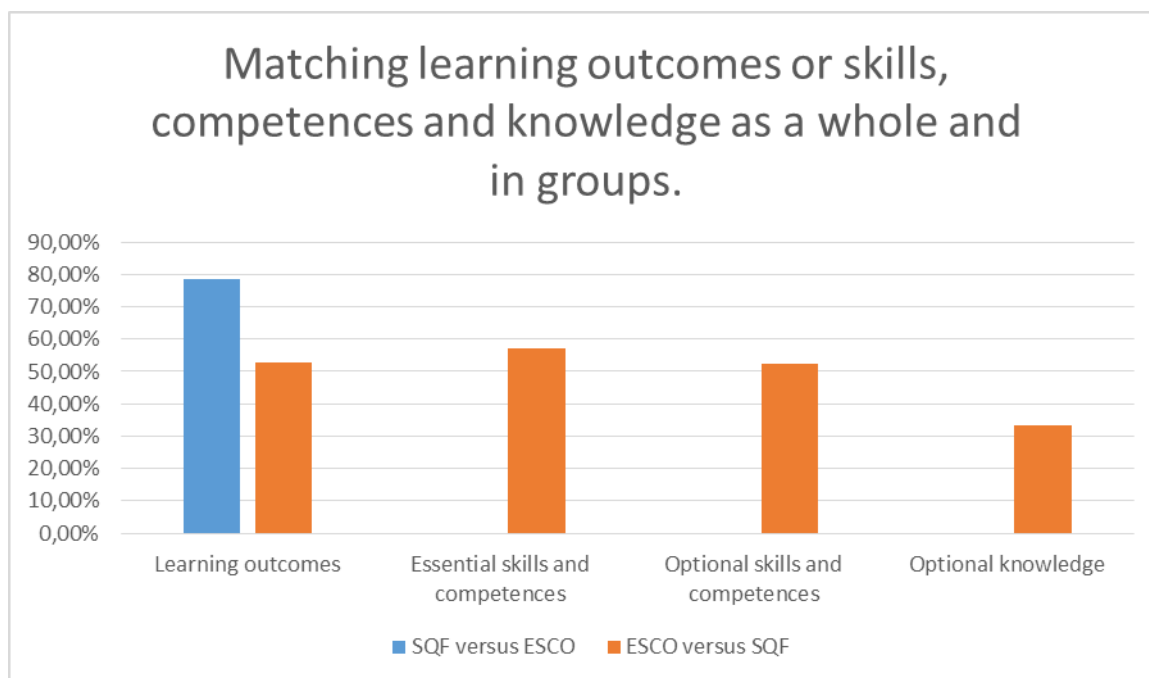
3.3.   Catering

Dietary cook: vocational qualification, SQF 5 / EQF š

The Dietary Cook qualification was mapped from two different perspectives: first, we compared learning outcomes from the National Vocational Qualification; secondly we compared the key tasks, skills and knowledge types from the Dietary Cook occupational standard (22154180); we then compared both with ESCO's description of a Dietary Cook. In this way, we compared the **same ESCO description** with the learning outcomes for the Dietary Cook qualification and in terms of the occupational standard, which is the basis for this vocational qualification.

The National Vocational Qualification Dietary Cook includes 7 learning outcomes; ESCO's description consists of 45 essential skills, competences and knowledge types, of which 15 are essential skills and competences, 2 essential knowledge types, 27 optional skills and competences, and 1 optional knowledge type.

In terms of SQF qualifications, all learning outcomes are included in ESCO's description, with a 100% match. We can also compare how many learning outcomes from the Slovenian qualification matched essential skills, competences and knowledge type: 5 out of 7 learning outcomes matched at least one essential skill, competence or knowledge type, a match of 71.4%.

In terms of ESCO's description of the occupation, no learning outcome from SQF could be attributed to 30 of ESCO's 45 essential skills, competences and knowledge types, a 33.3% match, of which no learning outcome in the NVQ could be matched with 8 of its 15 essential skills and competences, a 46.7% match; both essential knowledge types from ESCO's description matched a learning outcome from SQF, a 100% match; 21 out of 27 optional skills and competences showed no match between SQF and ESCO's descriptions, a 22.2% match; the optional sections in ESCO's occupation description did not match at all.

Comparison of key tasks, skills and knowledge types

The occupational standard Dietary Cook (22154180), which is the basis for the National Vocational Qualification Dietary Cook, comprises 12 groups of key tasks and 74 individual skills and knowledge types. ESCO's description of a Dietary Cook comprises 45 essential skills, competences and knowledge types, of which 15 were essential skills and competences, 2 essential knowledge types, 27 optional skills and competences, and 1 optional knowledge type.

In terms of the Dietary cook occupational standard, 16 out of 74 individual skills and knowledge types did not match ESCO's description of a Dietary Cook, a 78.4% match. All sets of the professional standard key tasks, except two, '*ensures and is responsible for the quality of the performed service and work*' and '*protects occupational health and safety at work*', were almost entirely included, and these two sets barely appear in ESCO's description of this occupation.

In terms of the occupational standard, if we take a look at how many individual skills and knowledge types matching an ESCO description also matched at least one essential skill, competence or knowledge type, we can state that

out of 58 skills and knowledge types, 55 individual skills and knowledge types matched, representing a 94.8% match.
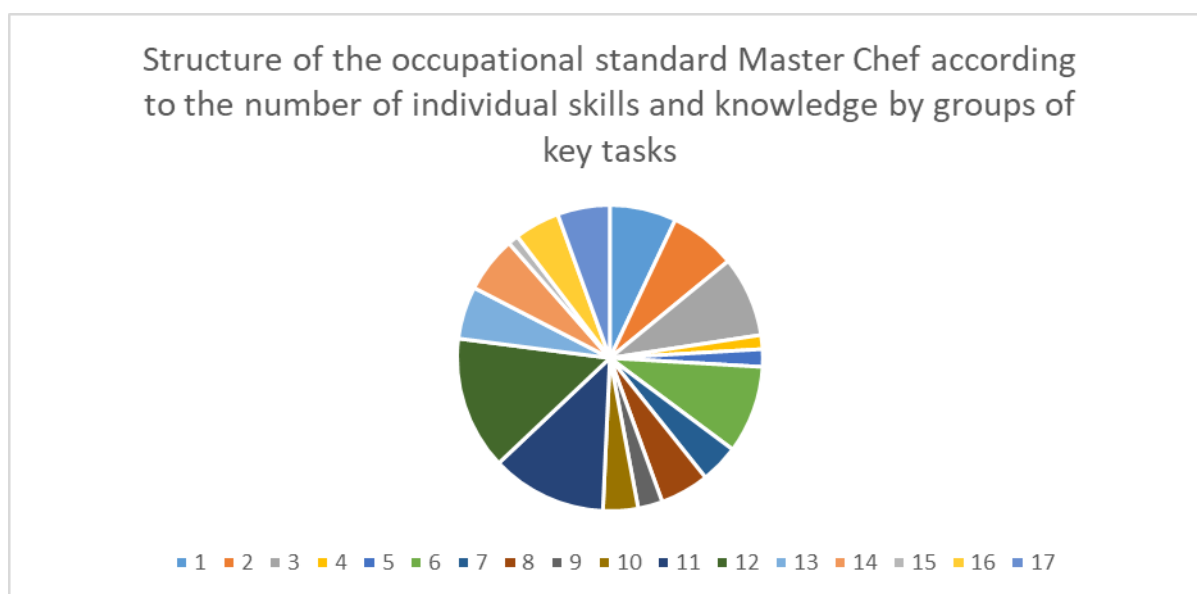
In terms of ESCO's occupation, no matching could be attributed to 29 of the 45 essential skills, competences and knowledge types, accounting for 35.6% of the entire description, of which 7 of the 15 essential skills and competences did not match, so matching was 53.3%; both essential types of knowledge type match a skill or knowledge type in the Slovenian occupational standard, a 100% match; 21 of the 27 optional skills and competences do not match the Slovenian occupational standard, a 22.2% match); optional knowledge types do not match the Dietary Cook occupational standard.

Low matching is a result of ESCO's description for a Dietary Cook being broader, it includes the skills, competences and knowledge types necessary for the basic occupation of a cook, but these skills and knowledge types are not included in the Slovenian occupational standard for Dietary Cook, they are an entry condition for the National occupational qualification for Dietary Cook.
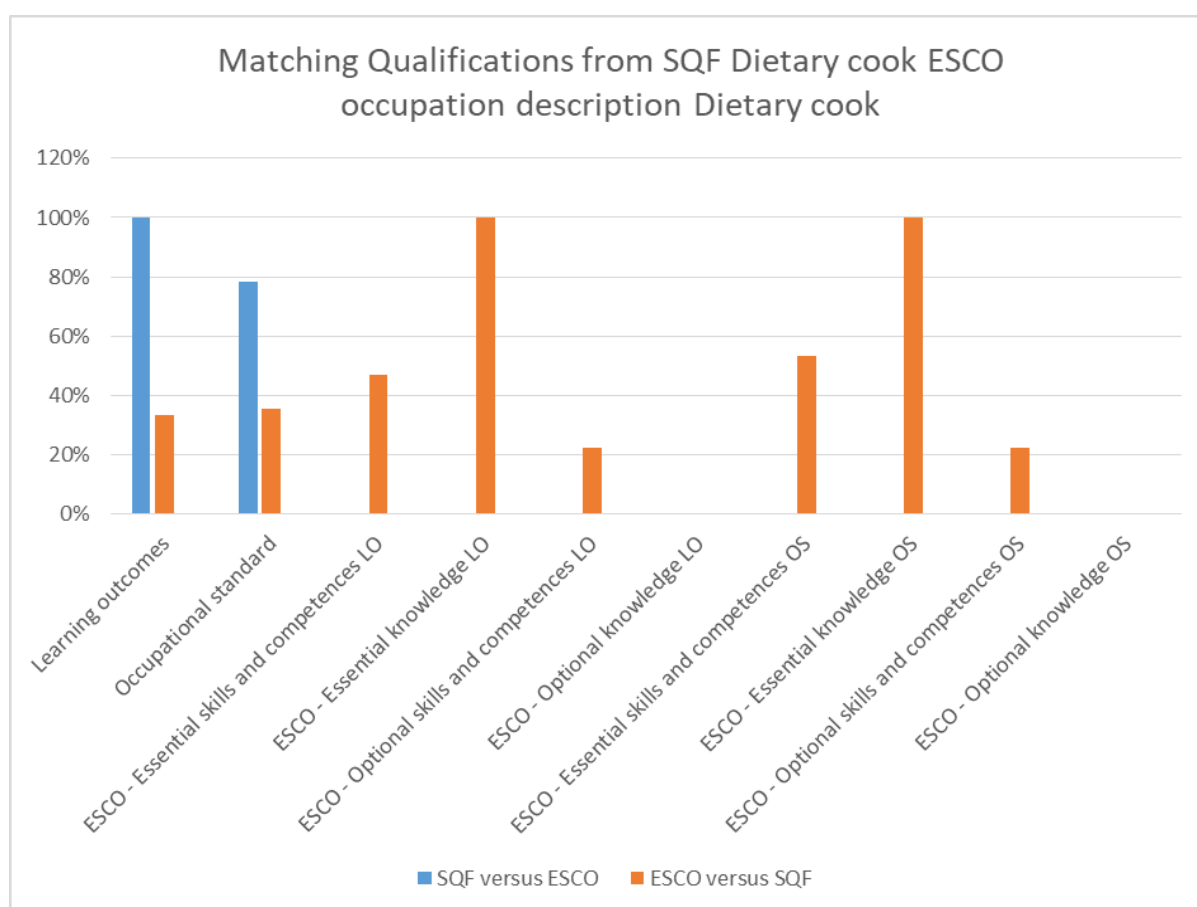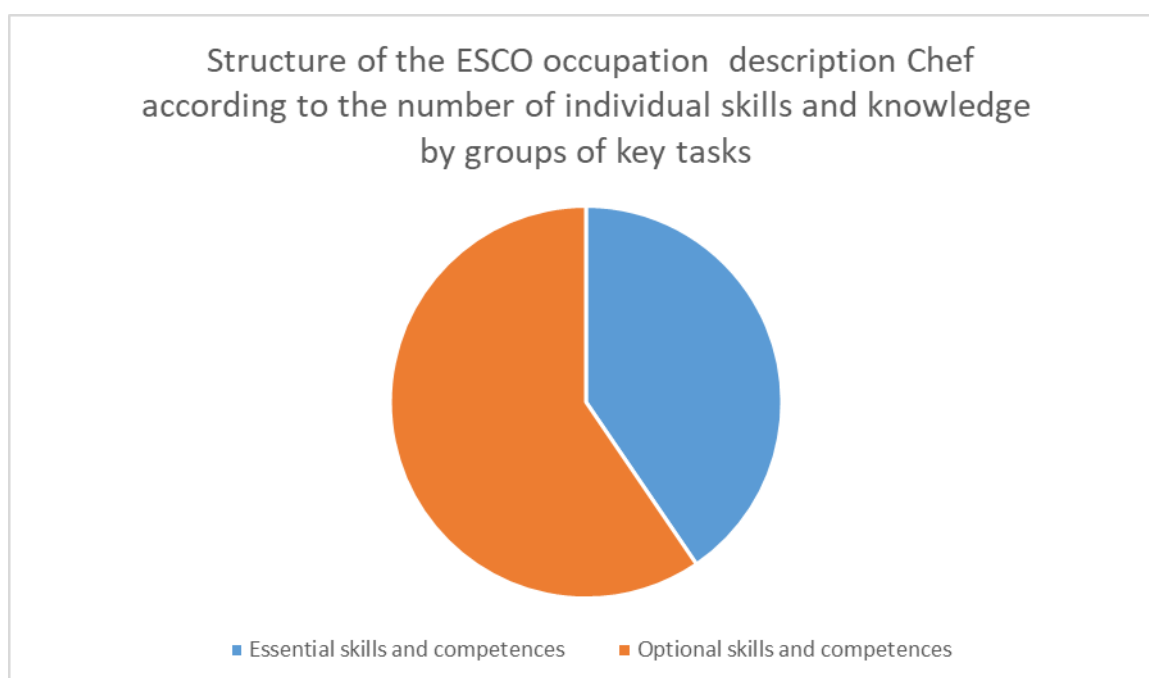
Master Chef; education, SQF 5 / EQF 4

The basis for the Master Chef qualification is the occupational standard Master Chef (66664830), comprised of 17 sets of key tasks, with a total of 270 individual skills and knowledge types.

Structure of the occupational standard Master Chef according to the number of individual skills and knowledge by groups of key tasks

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6 ■ 7 ■ 8 ■ 9 ■ 10 ■ 11 ■ 12 ■ 13 ■ 14 ■ 15 ■ 16 ■ 17

For this qualification, we took a slightly different approach and did not compare all individual skills and knowledge types, but compared individual sets of key tasks with ESCO's description for Chef, which has a total of 42 essential skills, competences and knowledge types, of which 17 are essential skills and competences, and 25 optional skills and competences.

Structure of the ESCO occupation description Chef according to the number of individual skills and knowledge by groups of key tasks

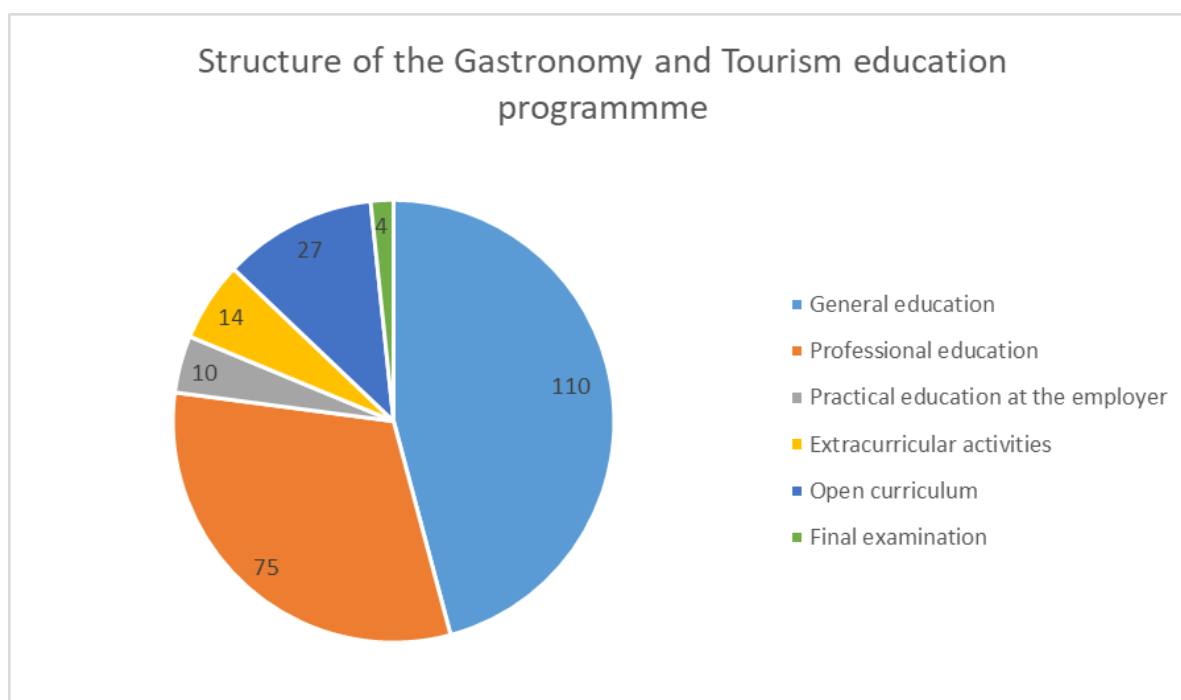■ Essential skills and competences   ■ Optional skills and competences

In terms of SQF qualifications for Master Chef, 2 of the 17 sets are not included in ESCO's description for Chef, so matching by set is 88.2%, of which 12 can be matched with essential skills and competences from ESCO's description, an 80.0% match.

In terms of ESCO's description for Chef, 6 skills and competences are found in the Slovenian occupational standard, an 85.7% match, of which the expert could not match 3 of the 17 essential skills and competences, an 82.4% match, and 3 of the 25 optional skills and competences, an 88.0% match.

Gastronomy-tourism technician: education, SQF 5 / EQF 4

We compared the Gastronomy and Tourism education programme, consisting of general education subjects and the following sets *catering and tourism basics: Entrepreneurship and legislation, Business communication and ICT, Natural and cultural heritage, Regular meal preparation, Extraordinary meal preparation, Regular meal serving, Extraordinary meal serving, Tourist guidance, Advice and sale of tourist products, Tourist information processing, Hotel and receptionist work, Dietary dish preparation, Catering, Aesthetics and sensory function, Cuisine and wines in Slovenia and abroad, Tourist service organisation, Hotel supplementary activities, Tourist destination management, Restaurant patisserie* and *Dish preparation in front of guests and drink mixing*; the following occupational standards are the basis for this education programme: Cook Assistant, Waiter/Waitress Assistant, Waiter/Waitress, Cook, Tourist Informer, Tourist Service Seller, Dietary Cook, Catering Manager, Tourist Animator, and Receptionist. As evident from the expert modules and list of occupational standards, the programme is very broad, including everything from catering and tourism to hotel services.

The graph below shows ratios between parts of the Gastronomy and Tourism education programme based on number of credits, whereby 1 credit equals 25 hours of candidate work:

Structure of the Gastronomy and Tourism education programmme

- General education — 110
- Professional education — 75
- Practical education at the employer — 10
- Extracurricular activities — 14
- Open curriculum — 27
- Final examination — 4

While mapping this qualification, we encountered some problems in terms of clarity due to the abundance of individual ESCO occupations; for this reason, we will present only one occupational standard, which is the basis for this qualification, and present a way to compare extensive and complex qualifications, which is also suitable for individual occupational standards.

The expert Srečko Koklič who mapped the field came to similar conclusions: "When comparing education programmes, I found how senseless it is to combine catering and tourism occupations because you get lost in the abundance of skills and competences. Our content is much more extensive, and really well designed and prepared."

Cook occupational standard 77460030

This occupational standard consists of 17 groups of key tasks and 153 individual skills and knowledge types. We will compare this occupational standard with ESCO's description for Cook, which is comprised of a total of 50 skills, competences and knowledge types, of which 16 are essential skills and competences, 29 optional skills and competences, and 5 optional knowledge types.

When comparing the Slovenian standard with ESCO's Cook, we compared groups of key tasks. We tried to match skills, competences and knowledge types from ESCO's description of the occupation to every skill and knowledge

type from every group. In terms of this standard, we will first compare groups of key tasks with ESCO's description, and finally present another method for determining matching.

All key groups of the Cook occupational standard are included in ESCO's occupation description for a Cook, so key tasks matching is 100%.

Evaluating how many groups of key tasks predominantly include essential skills or competences, we found that 12 of the 17 such groups did so, a 70.6%. matching of essential skills and competences.

In terms of ESCO's occupation description of a Cook, 12 out of 50 skills, competences or knowledge types do not match a skill, competence or group of key tasks, so matching is 76%, of which 2 of the 16 essential skills and competences do not match, a matching of 87.5%; for 8 of the 29 optional skills and competences, matching skills and competencies in the Slovenian standard could not be found, a 72.4% matching; moreover, matching could not be established for 2 of the 5 optional knowledge types, a 60% matching.

One way to determine matching is to consider individual skills and knowledge types that fall under a group of key tasks matched to skills, competences and knowledge types in an ESCO occupation description together with those that did not; in this way, we first determine an average value for every individual group based on the number of matching skills and knowledge types within a group of key tasks, then calculate average values for all groups of key tasks to obtain a more accurate matching result that is more detailed but not so much that minor deviations result in unsuccessful mapping, or entirely inconsistent qualifications.

Assuming that a group of key tasks includes 19 individual skills and that we were able to match 13 to ESCO's description, this group of key tasks would have a value of 13/19 or 0.68.

Taking the mapped occupational standard Cook as an example, we can provide values for all of its 17 groups of key tasks: 1; 1; 0.68; 0.82; 1; 1; 1; 0.81; 0.9; 1; 1; 0.57; 1; 0.33; 0.86; 1; 0.8. The average of all individual results is 0.8688, an 86.9% qualification matching.

Display of matching or mismatching between individual skills and knowledge within each group of key tasks
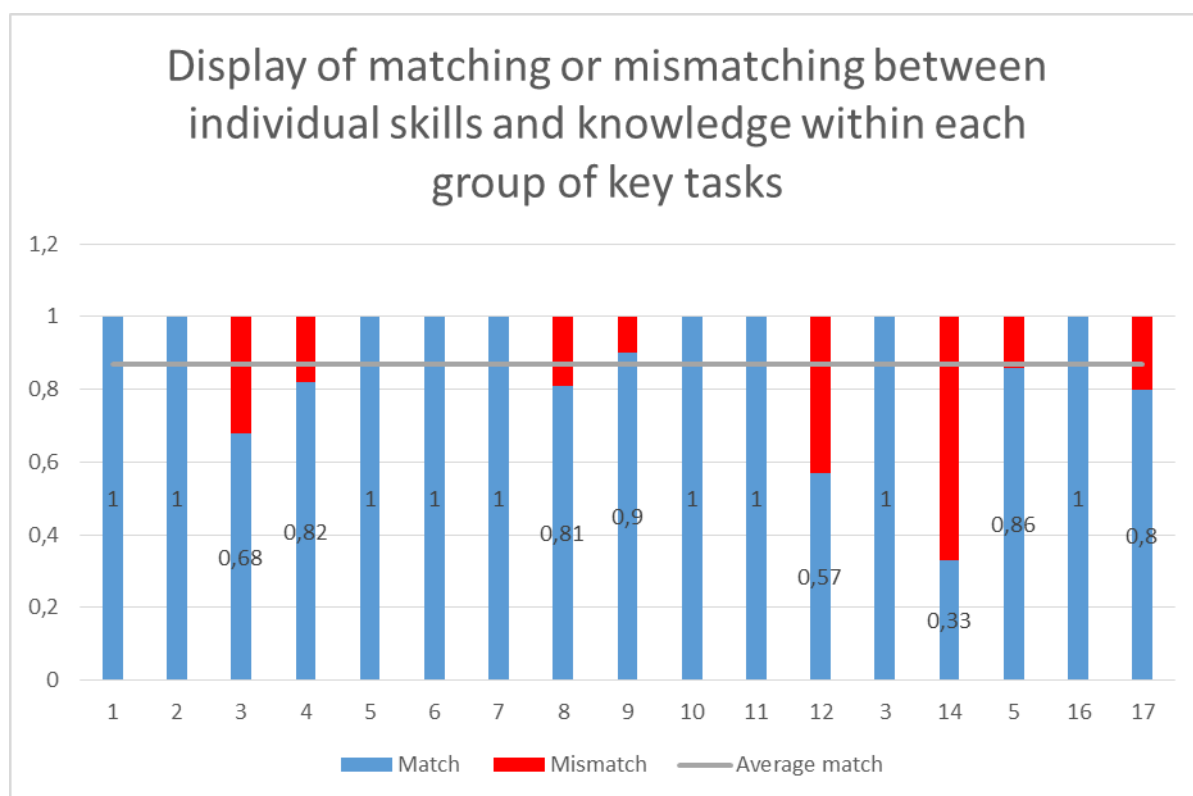
In this way we can also highlight the differences between the compared qualifications with different structures to prevent losing detail, that is the detail lost by only comparing by groups of key tasks that point to too large discrepancies by considering every individual skill or knowledge type. We expect result success to be somewhere between the two mentioned approaches. By also stating values for individual groups of key works or skills, we would get information on how much this group is presented in the compared qualification. If we notice, for example, that a group of key tasks is poorly presented or has low matching, we could evaluate whether we should add to the comparison an additional ESCO occupation description that might cover this group of key tasks as an independent or special occupation, or not. As already established for Cosmetic technicians and Gastronomy-tourism technicians, Slovenian qualifications are broader with greater potential to include many ESCO occupations. Perhaps, this could already be facilitated for an individual occupational standard if there is low matching in one or more groups of key tasks that might be described by another ESCO occupation.

Based on groups of key tasks that have very low matching, another ESCO occupation could be added to the comparison to fill the gap. Even so, we would get the best results by comparing all individual occupational standards (OS), which are the basis for a qualification and, if necessary, attribute to an OS a number of ESCO occupations that best match it. Furthermore, if we combined different OS, the basis of different qualifications based on education standards, we would find all of ESCO occupations that relate to a certain qualification.

By presenting the example of the Dietary cook occupational standard for comparison, which is the basis for the NVQ of the same name, we can assert that the matching average of groups of key OS task is 74.5%, presented in more detail in the table below:
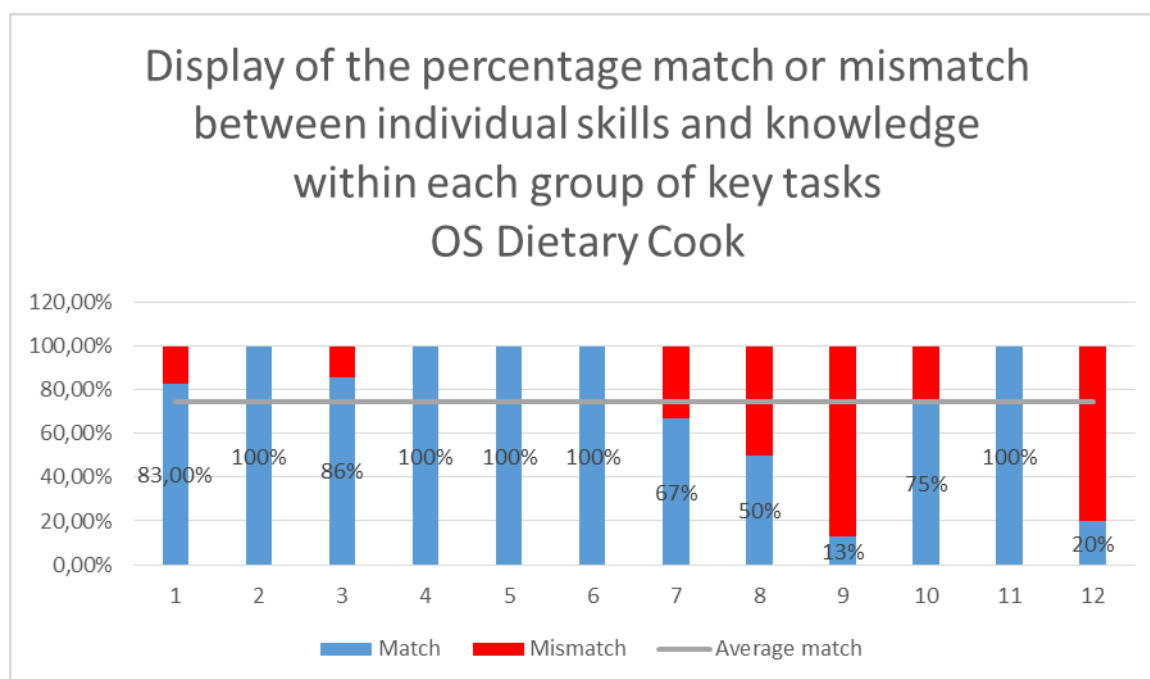
We see that groups of key tasks under numbers 8, 9 and 12 have a low match. Perhaps another corresponding ESCO occupation should be added to the Dietary cook occupational standard to capture the entire Slovenian qualification. We could also check if these cases include cross-sector skills included somewhere else in the qualification, for example, if they are assumed in the entry conditions, or in another ESCO occupation.

4. Linking learning outcomes: online tool testing under the auspices of the European Commission

Slovenia was one of the countries that tested a tool developed by the European Commission to compare national learning outcomes and ESCO skills, competences and knowledge types, the others being the Netherlands, Poland and Greece, with Romania and Latvia as observer countries.

Tool description

The online tool is available at: https://lo-linking.esco-projects.eu/upload. It enables the uploading of qualification learning outcome in any national language; it automatically detects the language of the learning outcomes, though languages can also be selected manually.

The tool then categorises all learning outcomes and proposes the best match with an ESCO skill, competence or knowledge type for every learning outcome using an automatic algorithm. The ESCO database can also be searched manually. A new skill, competence or knowledge type can be proposed if a matching skill, competence or knowledge type is not found within ESCO's database.

On the right side, we can choose a suitable skill that is transferred to 'Linked skills'. At the end, the tool exports all undoubled skills, competences and knowledge types marked in the CSV file.

The problem with the tool is that the skills comparison algorithm translates learning outcomes from a national language into English using Google Translate, and based on the translation it searches for suitable matches. The end data also do not distinguish whether we have attributed a certain skill, competence or knowledge type to a specific learning outcome, but only provide a list of all undoubled ESCO skills. The problem is that we wanted to capture one learning outcome in a national qualification with two skills, which is not evident in the final export. Here, large differences arise. For example, we wanted to pair the learning outcome 'independently prepares dishes' with ESCO's skills 'works independently' and 'prepares dishes', but this difference is lost in the final export because the skill 'to work independently' is attributed to the entire national qualification, even though it only refers to one task, with other tasks also marked as non-independent. With this tool, a holder of this qualification is seen to be able to work independently on every individual task defined, for example, by learning outcome, but in reality, it is only for a specific task; in this case, it is definitely not true that the sum of individual parts equals the sum of the whole.
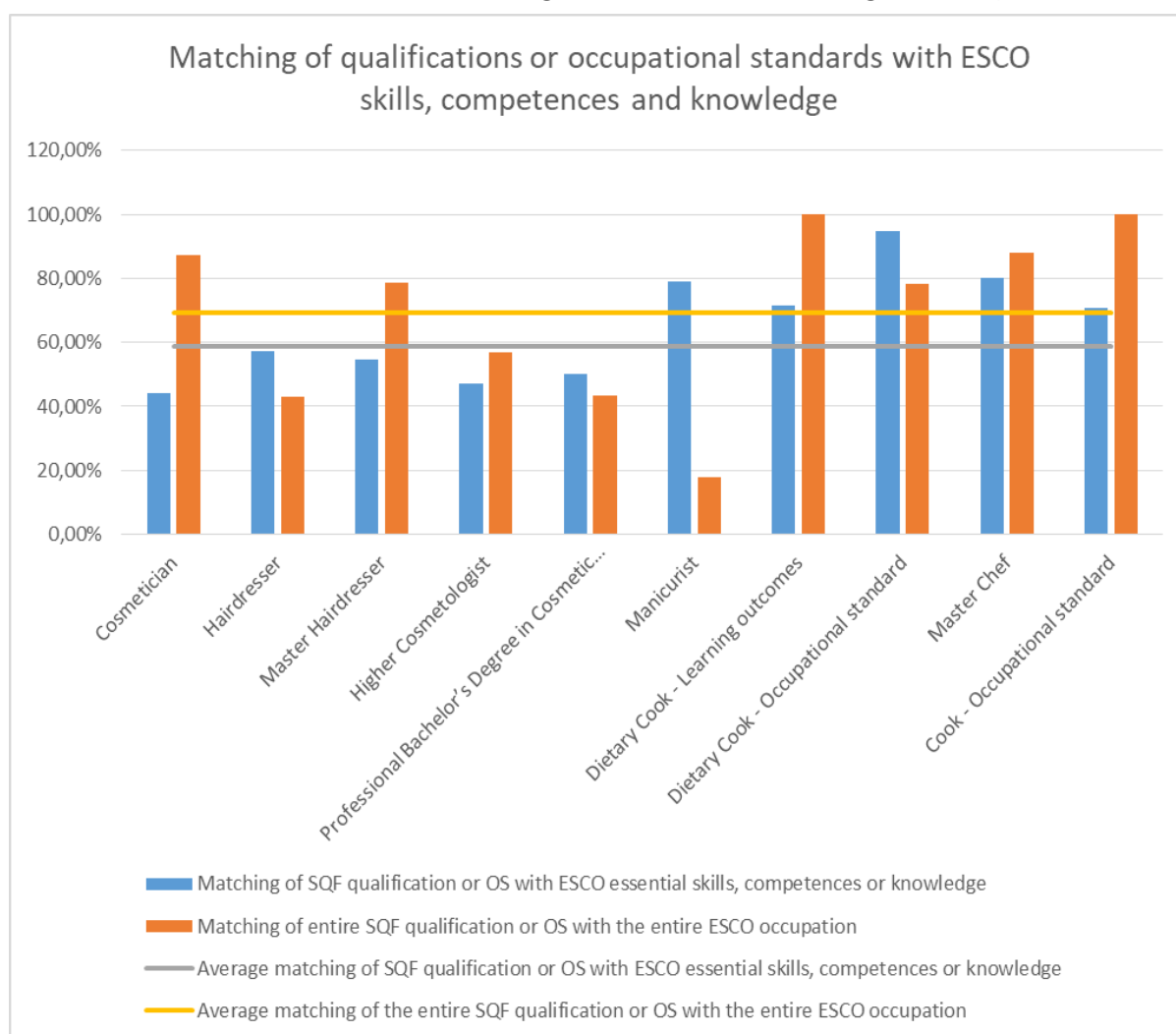
Another problem with this tool is that the skills, competences and knowledge types have no hierarchy: skills are not classified by field, but the tool freely proposes one based on algorithm matching. We noticed that tasks are not evenly distributed by field, for example, a task is limited to an area, but this does not necessarily hold true for all fields. The broadness and specific features of skills, competences and knowledge is not evenly distributed by field, but certain fields have expressly narrow tasks and some only have very general ones.

It can also not be marked if a learning outcome is a perfect or partial match.

At the last workshop held on 10 December, 2019, in Brussels, Poland, Slovenia and the Netherlands, and Romania as observer country, presented results for this tool testing; all of the countries faced similar tool restrictions and they highlighted problems with the automatic translations that prevented the tool's algorithm from finding suitable skills, and learning outcome diversity and differences in their complexity; the tool should be further adjusted, including improving its translation and matching algorithms.

5. Conclusions

In the graph below we see the matching for all of mapped qualifications in terms of essential skills, competences and knowledge types; as already shown by the individual case graphs, the best match was evidenced in terms of essential skills, competences and knowledge types. This was expected and desired, as all these skills, according to ESCO, supposedly represent essential features of an occupation that bridges difference between employers and countries. Nevertheless, an even higher level of matching was expected.

Matching of qualifications or occupational standards with ESCO skills, competences and knowledge

- Matching of SQF qualification or OS with ESCO essential skills, competences or knowledge
- Matching of entire SQF qualification or OS with the entire ESCO occupation
- Average matching of SQF qualification or OS with ESCO essential skills, competences or knowledge
- Average matching of the entire SQF qualification or OS with the entire ESCO occupation

Experts provided their opinions at the final workshop held on 18 December, 2019, in Ljubljana. It was generally agreed that the majority of Slovenian qualifications were quite broad and included several ESCO occupations in various fields. Cosmetics expert Petra Keršmanc said, "My opinion about differences between qualifications from SQF and occupation descriptions from ESCO is that comparison is quite difficult because it does not include various levels of knowledge types, skills and competences. ESCO's Cosmetician is very narrow, our qualification includes other fields considered as separate occupations by

ESCO, such as Pedicurist, Manicurist, and Cosmetic Care Teacher in vocational education. The qualification Master of Cosmetics is quite different to ESCO's Cosmetician. Furthermore, I believe that comparison is difficult because SQF's general and subject-specific competences are very broad and ESCO's very narrow."

ESCO does not have uniform logic and taxonomy as to how skills, competences and knowledge types are structured by individual field, which was also noticed when testing the learning outcomes linking tool; this is why there are very big differences between fields, which is reflected in mapping complexity or, as said by Srečko Koklič, "I can say that we have a very refined occupational standards formation system, which is systematically arranged, grouped by content and presented in a logical sequence, which I definitely cannot say for ESCO. We may have complicated our content sets when preparing and writing it, such as SQF's Dietary Cook, where we have listed all diets; ESCO merely refers to preparing all types of diets… and many more. Another point of interest is that such basic occupation content does not appear in our NVQs, only professional knowledge of a specific NVQ, such as Wine Consultant and Barman, which is why it is difficult to follow individual SQF and ESCO lines and connect them because we get lost in additional content fragmentation, even though contents sets do match."

In this way, we can probably explain the low matching of some specific qualifications. Slovenian qualifications do not have specifically stated skills and knowledge types for a basic occupation, but such qualifications are only upgrades of basic occupations because they have certain entry conditions. ESCO does not have entry conditions and an entire occupation is always described; moreover, ESCO does not have levels to which skills, competences, knowledge types and occupations should be classified, and this is the reason for qualification mismatches based on the same occupation with different complexity levels. To mitigate such problems, it would be reasonable to take note of qualification entry conditions in the possible future comprehensive mapping, and add these skills and knowledge types to the comparison with certain ESCO occupations to adequately capture them. Likewise, general education subjects should be included as they represent a large part of Slovenian education programmes. At this point, we would also like to mention that cross-sectoral skills included in ESCO occupation descriptions should perhaps be specifically emphasised because certain sets of key tasks do not match ESCO occupations in terms of these skills.

An additional mapping problem was the translations of ESCO descriptions, where certain established terms are translated differently than in Slovenia, causing confusion and problematic comparison of skills, competences and knowledge types.

The pilot mapping of SQF qualifications and ESCO occupations definitely provided valuable findings about the structure of both systems and how more ex-

tensive mapping could be implemented. There is no evidence to suggest that only qualifications and occupations of the same name should be compared because this may cause substantial differences in perception as to what an occupation is in a country when it is defined by another country. This is why this is just the first step in showing the entire field of qualification and range of occupations that should be compared, as presented in the comparison of qualifications from the Slovenian Qualifications Framework and ESCO occupation descriptions.

6. Literature

- European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Directorate E, *ESCO handbook: European Skills, Competences, Qualifications and Occupations*, European Union, 2019.

- Muršak, J. (2012), *Temeljni pojmi poklicnega in strokovnega izobraževanja*. Ljubljana: Center RS za poklicno izobraževanje.

- http://www.cpi.si/srednje-strokovno-izobrazevanje.aspx#Kozmetinitehnik, January 2020

- http://www.cpi.si/srednje-strokovno-izobrazevanje.aspx#Gastronomijainturizem, January 2020

- https://ec.europa.eu/esco/portal/home, January 2020

- http://www.nok.si, January 2020

7. Notes

1) European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Directorate E, *ESCO handbook: European Skills, Competences, Qualifications and Occupations*, European Union, 2019, pg. 14 -15.

2) Here, we need to emphasise the difference between the terms 'occupation' and 'qualification' as defined in Muršak's *Temeljni pojmi poklicnega in strokovnega izobraževanja* on pages 54 and 73. In this report, qualification is understood to be a formal qualification (an official document, such as a diploma or certificate) proving that a person has achieved the pre-determined learning outcomes and that they have the competences enabling them to carry out work in a specific field; an occupation is understood to be a statistical and analytical category including work that is relative in terms of content and complexity that can usually be performed by one person. Traditionally, the Slovenian term 'poklic' has a broader meaning, it is used to translate three English terms: occupation, vocation and profession. To carry out a certain occupation, a person usually needs a certain entry qualification, education or certificate, but this is not an essential condition for all occupations, hence it is not a defining condition. (Muršak, J. (2012), *Temeljni pojmi poklicnega in strokovnega izobraževanja.* Ljubljana: Center RS za poklicno izobraževanje.)

3) Education is based on various occupational standards; a large part of an educational programme is taken by general education subjects. The national vocational qualification is based on one occupational standard, and supplementary qualifications are not based on any occupational standard.

4) Slovenian (24 Credits), Mathematics (19 Credits), Foreign language (20 Credits), Art (3 Credits), History (5 Credits), Geography (3 Credits), Psychology or sociology (3 Credits), Physics (3 Credits), Chemistry (3 Credits), Biology (3 Credits), and PE (14 Credits)

5) Here, we should highlight the skills and knowledge from three sets of key tasks with the lowest matching in terms of ESCO occupation skills, competences and knowledge, that is 'prepares a time schedule and work place', 'conducts self-evaluation' and 'cooperates in an expert team and advises co-workers'.

6) The mismatch occurred particularly in the competences concerning ethical conduct, understanding cultural diversity, the use of Slovenian and other foreign language and competences requiring analytical and independent work, and conceptual thinking. We could argue that the mismatch occurred in cross-sector skills and the skills specific for a higher qualification level.

7) The mismatch occurred in relation to the more complex skills required to gain a qualification, such as the use of complex devices and special technique.-

8) Skill discrepancy primarily occurs in relation to the structure and preparation of cosmetic products, hydrotherapy, and permanent makeup.

9) The mismatch occurred primarily in competences requiring analytical, scientific and methodological knowledge, such as required by the qualification at this level, and commitment to ethical reflection and professional ethics.

10) The mismatching competences refer to work organisation, self-education, holistic approach, knowing the relation between the dosage and effect of a cosmetic product.

11) These were subject-specific competences related to the expert field of cosmetology.

12) Skills and knowledge related to nail decoration, performance of services for clients, working under the ergonomics principle, maintaining equipment and compliance with cosmetics regulations do not match.

13) 'perform various makeup techniques and types, and prepare masks pursuant to professional rules', 'perform manicure pursuant to professional rules', 'comprehensively and responsibly manage and monitor implementation of regulations and standards regarding occupational health and safety and environmental principle in the hair salon'.