

FUNCTIONAL ANALYSIS AND FUNCTIONAL MAPS OF QUALIFICATIONS IN ECVET CONTEXT

V. A. Kopnov¹, O. V. Shmurygina², D. E. Shchipanova³, M. A. Dremina⁴

Russian State Vocational Pedagogical University, Yekaterinburg, Russia.
E-mail: ¹vitalij.kopnov@rsupu.ru; ²shmur-olga@yandex.ru; ³mdryomina@yandex.ru;
⁴dina_evg@mail.ru

L. Papaloizou

Intercollege, Nicosia, Cyprus.
E-mail: papaloizou.l@intercollege.ac.cy

Y. Orphanidou

University of Nicosia, Nicosia, Cyprus.
E-mail: orphanidou.y@unic.ac.cy

P. Morevs

Liepaja University, Liepaja, Latvia.
E-mail: acentrs@liepu.lv

Abstract. *Introduction.* Activation of the process of internationalisation and mobility in Russian Vocational Education and Training (VET) is quite possible by adapting principles and methodology of the European Credit Transfer System for Vocational Education and Training (ECVET). The need to achieve transparency of qualifications, recognition of learning outcomes in view of achieving qualifications, accumulation, comparison and transfer of learning outcomes becomes more apparent and urgent for integration processes of VET systems in Russia and European Union countries and is currently under consideration by the RUECVET project team¹.

The aim is to adjust application of functional analysis to description of an occupation in terms of work functions with the following conversion of the defined functions into sets of learning outcomes necessary for characterizing a qualification. The ECVET principles and technical specifications form the context of the research in order to develop an adequate VET study programme for achieving the

¹ Available from: <http://www.ruecvet.uz/en/>

correspondent qualification of level 4 or 5 of the European Qualifications Framework (EQF) in the Russian education environment.

Methodology and research methods. The methodology is based on the functional analysis of an occupational sector and the functions performed within it in such a manner that the following identification of the correspondent units of learning outcomes for the relevant qualification can be fulfilled. The research has been conducted by means of the content-analysis, modelling and expert estimation method.

Results and scientific novelty. Comparative analysis of approaches to the design of occupations and qualifications in both national and European environments is presented in the article. The functional analysis is used for allocation of work functions and creation of units of learning outcomes related to a particular qualification. The procedure of applying functional analysis to an occupation as well as the technology of consequent construction of the functional map for the correspondent qualification taking into account the relevant educational and occupational standards and sectoral preferences have been elaborated. The result of the study is adaptation of methodology of functional analysis and verification of the developed procedure when constructing a functional map of the chosen qualification. The procedures are illustrated on the qualification of a lawyer achieved in the VET study programme "Legislation and Social Protection", equivalent to level 5 of the European Qualifications Framework (EQF). Successful experiments with occupations of welders, electricians, web designers, hospitality managers and others related to the qualifications of level 4 and 5 of EQF have been also completed in RUECVET project, although are not described in the article due to the restricted volume.

Practical significance. The derived procedures are useful for development of a set of detailed learning outcomes from functional mapping by allocating knowledge and skills and using the concept of unit of learning outcomes for compilation of a qualification in accordance with the relevant educational and occupational standards and employers' understanding how the real work should be performed. The procedures are useful also for identifying units of learning outcomes to build an adequate VET study programme in ECVET context of Russian educational system.

Keywords: functional analysis, Vocational Education and Training (VET), VET study programme, learning outcomes, units of learning outcomes, European Credit Transfer System for Vocational Education and Training (ECVET), European Qualifications Framework (EQF), RUECVET.

Acknowledgements. The research in RUECVET project was funded by Education, Audio-visual and Culture Executive Agency, Erasmus+, ref. № 574097-EPP-1-2016-1-CYEPPKA2-CBHE-JP. The authors are also grateful to all partners of RUECVET project with their valuable contributions to discussions and verification of the developed procedures.

For citation: Kopnov V. A., Shmurygina O. V., Shchipanova D. E., Dremi-na M. A., Papaloizou L., Orphanidou Y., Morevs P. Functional analysis and func-ti-

onal maps of qualifications in ECVET context. *The Education and Science Journal*. 2018; 6 (20): 90–117. DOI: 10.17853/1994-5639-2018-6-90-117

ФУНКЦИОНАЛЬНЫЙ АНАЛИЗ И ФУНКЦИОНАЛЬНЫЕ КАРТЫ КВАЛИФИКАЦИЙ В КОНТЕКСТЕ ECVET

В. А. Копнов¹, О. В. Шмурыгина², Д. Е. Щипанова³, М. А. Дремина⁴

*Российский государственный профессионально-педагогический университет,
Екатеринбург, Россия.*

*E-mail: ¹vitalij.kopnov@rsu.ru; ²shmurygina@yandex.ru; ³mdryomina@yandex.ru;
⁴dina_evga@mail.ru*

Л. Папалуиза

Интерколледж, Никосия, Кипр.

E-mail: papaloizou.l@intercollege.ac.cy

Я. Орфанидоу

Университет Никосии, Никосия, Кипр.

E-mail: orphanidou.y@unic.ac.cy

П. Морев

Университет Лиены, Лиена, Латвия.

E-mail: acentrs@liepu.lv

Аннотация. Введение. Активизации процессов мобильности и интернационализации в системе среднего специального и высшего российского образования способствует внедрение в нее методологии и инструментария European Credit System for Vocational Education and Training – ECVET (Европейской системы зачетных единиц для профессионального образования и обучения). Необходимость прозрачности приобретаемых студентами квалификаций, устанавливаемых посредством единых механизмов оценки, признания, накопления и сравнения результатов профессиональной подготовки, становится более очевидной и актуальной в связи с интеграцией образовательного пространства России и Европы. В настоящее время изыскания в этом направлении ведутся группой ученых, участвующих в пилотном международном проекте RUECVET¹.

Цель публикации – представить разработанную авторским коллективом исследователей методику описания квалификации – определения подразуме-

¹ Режим доступа: <http://www.ruecvet.uz/en/>.

вающихся под ней трудовых функций с последующим их преобразованием в показатели результатов обучения, характеризующих данную квалификацию, которая присваивается по завершении программы профессиональной подготовки.

Методология и методы. В ходе работы в качестве методолого-методической базы использовались функциональный и сравнительный виды анализа, методы контент-анализа, моделирования и экспертной оценки.

Результаты и научная новизна. Сопоставлены подходы к проектированию профессий и квалификаций, применяющиеся в странах Евросоюза и в Российской Федерации. Исходя из синтезированного опыта разных государств, адаптированного к российским экономическим и образовательным реалиям, выделены обобщенные трудовые функции ряда специальностей, соответствующих 4-му или 5-му уровням Европейской рамки квалификаций (EQF). На основе этих функций и с учетом содержания действующих образовательных и профессиональных стандартов, а также мнения работодателей сформированы блоки результатов обучения, требующихся для достижения определенного квалификационного уровня. Продемонстрирован процесс создания функциональной карты конкретной квалификации. Технология построения функциональной карты проиллюстрирована на примере специальности среднего профессионального образования «Право и организация социального обеспечения» (в EQF относится к 5-му уровню). Отмечается, что ряд подобных успешных экспериментов был проведен с профессиями сварщика, электрика, веб-дизайнера, специалиста по гостеприимству и др.

Практическое значение. Предлагаемые процедуры детализации профессиональных знаний, умений, навыков и компетенций и комплектования из них блоков результатов обучения в виде функциональных карт для конструирования и оценки квалификации позволяют разрабатывать адекватные требованиям мирового рынка труда программы профессионального образования. Технология, основанная на функциональном анализе, отвечает принципам и техническим требованиям ECVET и дает возможность измерять и регистрировать результаты обучения согласно международной системе зачетных единиц (кредитов).

Ключевые слова: функциональный анализ, профессиональное образование и обучение, образовательная программа среднего профессионального образования, результаты обучения, блоки результатов обучения, Европейская система зачетных единиц для профессионального образования и обучения (ECVET), Европейская рамка квалификаций (EQF), RUECVET.

Благодарности. Исследование в рамках пилотного проекта RUECVET поддерживается Исполнительным агентством по образованию, аудиовизуальным средствам и культуре (проект № 574097-EPP-1-2016-1-CYERPPKA2-CBHE-JP). Авторы признательны всем партнерам проекта RUECVET за их вклад в дискуссии и апробацию предложенных процедур функционального анализа.

Для цитирования: Копнов В. А., Шмумыгина О. В., Щипанова Д. Е., Дремина М. А., Папалуиза Л., Орфанидоу Я., Морев П. Функциональный анализ и функциональные карты квалификаций в контексте ECVET // Образование и наука. 2018. Т. 20. № 6. С. 90–117. DOI: 10.17853/1994-5639-2018-6-90-117

Introduction

Globalization of education and integration of the Russian Federation into European educational area is impossible without coordination efforts applied within the Russian educational system to align it with the European (often universal) requirements based on transparency of qualifications [1, 2].

All experts engaged in development of study programmes for vocational education and training (VET) inevitably face the challenge of efficient and accurate identification and description of the training programme learning outcomes, which correspond to a certain qualification (skill level) within a specific occupational area. When building a vocational study programme, a team of developers should proceed not so much from the provisions of the available educational standards but, to a greater extent, from the needs of sectoral/occupational area – considering the qualifications that are in demand within a particular sector and the functions that make up the essence of a specific qualification. Labour market research, direct contact with employers, combined with the expertise of study programme developers will allow to identify and relate the market demands to the existing restrictions as to the content and form of study programme delivery according to 1) educational standards representing the aggregated experience and understanding of educational community and 2) occupational standards representing the aggregated experience and understanding of employers and professional associations.

Thus, the contradiction between the need of coordination of labour market and educational services, on the one hand, and educational spaces of the Russian and European educations, on the other hand, is observed, which demands construction of a uniform methodological basis and mechanisms of interaction for creation of a toolkit for ensuring transparency and recognition of qualifications. This contradiction is the cornerstone for our research problem.

The most developed method [3] of identifying learning outcomes within one or another training programme is comparing the projected learning outcomes to the functional map designed for a specific qualification. In most cases, such functional maps are not developed and, thus, before designing a programme, one has to provide a functional map of the qualification. For instance, if one tries to develop a VET study programme and bring it in line with the European credit

transfer system for VET (ECVET), this cannot be done without the functional map¹ [3–5] that has been independently built and commonly agreed with the employers, for it will be impossible to describe the study programme in terms of units of learning outcomes, which is compulsory for ECVET implementation [6]. Study programmes that exist in Russia, even those built on a modular basis; nevertheless, inherit an outdated content approach to programme development, while the employer requires adequate programmes from the VET system so that a graduate can start real work without delay and with no additional training. Currently, we see only one method of providing adequate study programmes – giving priority to the learning outcomes, which meet the labour market demands [3–5]. Only those learning outcomes that are projected together with the employers and arranged in the hierarchical system can form a functional map of the needed qualification. The functional map, therefore, becomes a basis for designing VET study programmes to apply for full-time, part-time and additional training, and to cover the appropriate qualification level within a particular occupational area [6].

When implementing the ECVET system for a VET study programme, a team of developers should take several actions to correctly describe the units of learning outcomes. The latter are considered to be both constituent parts of the qualification, and the results of the educational process, that is what the learner has to know and be able to do by the end of the programme. The actions to be taken are based on the universal method – functional analysis of the chosen qualification within a specific occupational area. The final step of the analysis is developing a functional map.

Functional analysis² is the main tool that is used to determine the nature of the industry sector and the work functions performed therein. In addition, functional analysis is an important process of identifying vocational competencies and establishing boundaries between different qualifications. A detailed functional map makes it possible to establish the unique character of each occupation for the appropriate level of qualification and to realise, in what ways the considered qualification is different from all the others³ [4, 7, 8]. Functional comparison of various labour actions also contributes to identifying the work functions necessary to achieve a certain level of specific activity that enables definition of occupational competency through creation of new or adoption of existing National

¹ Boutall T., Carroll G. National occupational standards: a good practice guide. London: CJNTO; 1999. 77 p.

² ESCO: European Skills, Competences, Qualifications and Occupations. Available at https://ec.europa.eu/esco/portal/escopedia/Functional_analysis

³ Mansfield B., Mitchell L. Towards a Competent Workforce. Aldershot: Gower, 1996. 351 p.

Occupational Standards. Functional analysis may serve as a tool of seeking a "consensus" between the requirements of occupational and educational standards. It also provides a clear understanding of the list and content of work functions within the qualification required by the real employer or employers' associations (Skill Advisory Bodies).

The ECVET implementation requires introduction of new definitions as well as modification of already existing ones in the field of vocational education and labour.

Literature Review

The Copenhagen Declaration¹ adopted in 2002 became a starting point for reforms of vocational education and training in the European states, and respectively for development of new methodological approaches of structuring this sphere on the basis of creation and introduction of the European Credit Transfer System for Vocational Education and Training (ECVET).

Further, there was a long period of definition of the main key moments connected with introduction of ECVET in the national systems of vocational education and training of the European states. A number of important documents, which have designated the main stages of introduction of the credit system for VET, were accepted. By 2005, the interim report of the European Commission had formed a general view of the system and highlighted its components, developed basic documents for all stakeholders (trainees, providers, employers and others).

Only in 2009 the European Parliament finally approved² the ECVET system, after which the gradual introduction of the system of credits in European countries began. In the European strategic framework "Education and Training 2020", the ECVET system was tested in pilot projects throughout the European Union with the aim to gradually extend the system of credits³. Nevertheless, some researchers note that a certain level of opposition to the full-scale adoption of ECVET remains, to a large extent this is due to the use of

¹ Декларация Европейской Комиссии и министров профессионального образования европейских стран по развитию сотрудничества в области профессионального образования и обучения в Европе, принятая на заседании 29–30 ноября 2002 г. в Копенгагене (Копенгагенская декларация) [Электрон. ресурс]. Режим доступа: <http://official-europass.narod.ru/>

² Recommendation of The European Parliament and of the Council of 18 June 2009 on the establishment of a European Credit System for Vocational Education and Training (ECVET) (2009/C 155/02). Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:155:0011:0018:EN:PDF>

³ ECVET Toolkit. Available at: <http://www.ecvet-toolkit.eu>

learning outcomes and their evaluation, regardless of the context and duration of training (L. Krichewsky 2016) [10].

At the same time, as CEDEFOP director¹ noted in the report in 2016, it became difficult to separate development and introduction of the principles of ECVET from development of national qualifications frameworks. These processes go in parallel. The progress achieved already has to promote further transparency in the VET systems of the European states and creation of the general ECVET platform.

Reaching transparency in the system of vocational education and training as other researches underline (M. Pilz, J. Li, R. Canning, S. Minty, 2017) [10] is possible if study programmes are built on the modular principle. This is also promoted by the ECVET tools (learning outcomes, units of learning outcomes, credits, ECVET points, etc.) [11].

At the heart of the modular principle of building study programmes, many states have laid the functional analysis, which is the main tool for determining the essence of work in occupational sectors and work functions performed within it. This is the process of determining vocational knowledge and skills and establishing boundaries between different occupations and professions. Functional maps become a link between occupational standards and specific study programmes (Geoff Carroll and Trevor Boutall, 2011) [4].

The functional analysis was originally developed in the UK. This method was described in detail by Bob Mansfield and Lindsay Mitchell (1996). The process of analysis consists of two stages, called “functional mapping” and actually “functional analysis”. The first stage includes definition of those areas and spheres that constitute the occupation, the identification of common characteristics that form a key goal. At the next stage of the analysis, the key goal is divided into general work functions, each of them is divided into even smaller and specific work functions and actions until the necessary level of detailing is achieved so the correspondent level of learning outcomes can be described and the module title of educational programmes can be defined (2001)² [12, 13].

The main methodological approaches to the analysis of qualifications in ECVET context are also presented in works of Almeida & Sulzer (2014) [14], Riela & etc (2014) [15], Savaa & Borcaa (2016) [16], Kovácsa & Pató (2014) [17].

If in the member states of European Union the functional analysis is applied to creation of occupational standards, then Russian researchers have gone a

¹ ECVET in Europe: monitoring report 2015. Luxembourg: Publications Office // Cedefop research paper. № 56. Available from: <http://dx.doi.org/10.2801/946187>

² Mansfield B., Mitchell L. Towards a Competent Workforce. Aldershot: Gower, 1996. 351 p.

way back and suggested to use it for the analysis of the existing occupational standards with the subsequent expert assessment of employers' feedback and their further adjustment (Oleynikova, 2007; Konovalova, 2009) [3, 18–20].

Materials and Methods

Methodological approach of our research is based on determination of vocational knowledge, skills and competences, understood as autonomy and responsibility needed for a certain occupation or a field of activity by creating new or modifying the existing units of learning outcomes, which describe what the worker at this occupation has to be able to do and what knowledge and skills are needed. The complete set of units of learning outcomes forms a qualification as a consequence.

The conducted research has revealed the need to specify terminology that defines an opportunity of using methods and tools of the functional analysis for the introduction of the principles of ECVET in the system of Russian VET.

So, we define “work functions” as labour actions that a person is to perform as part of the job. These actions are not accidental; they must have a clear goal and defined outcomes that are relevant for the employer. The procedure of functional analysis makes it possible to split the considered qualification into components, that is, such activities, which require a coherent set of knowledge, skills, and competencies (responsibility and autonomy), and then integrate them into specific work functions that employees are to fulfil. In other words, work functions describe what should employees be able to do as part of their job. Once the work functions are identified, a team of developers may start negotiating with the employers upon the content and description thereof. Direct contact with employers may also contribute to creating more efficient national occupational standards, study programmes, and possibly federal state educational standards [3–5]. As to the definition of *competency*, in most cases covered in this paper, a competency is understood as a level of responsibility and autonomy that is needed to perform labour actions or demonstrate the achieved learning outcomes.

Learning outcomes are statements of what a learner knows, understands and is able to do on completion of the learning process, which is interpreted in terms of knowledge, skills and competencies¹.

Unit of learning outcomes is a component of qualification, consisting of a coherent set of knowledge, skills and competencies that can be assessed and validated; or it is a set of knowledge, skills and/or compe-

¹ Terminology of European education and training policy. SECONDEDITION. 2014. <http://europass.cedefop.europa.eu>.

tencies that constitute an agreed part of the qualification. A unit can be the smallest part of the qualification that can be evaluated, transferred, and possibly certified. It can be specific for one qualification or common for several qualifications. Characteristics of units (content, size, total number of units that make up the qualification, etc.) are determined by a competent authority responsible for certain qualification at the appropriate level. Definition and description of units may vary depending on the system of qualifications and procedures conducted by the competent body. Yet, ECVET proposes to provide the following elements for each unit: a title; a set of knowledge, skills and competencies contained in it; criteria for assessing the relevant learning outcomes¹.

Functional map is a structured description of the work functions to be performed within a specific qualification [2–4].

When using the functional analysis all interested parties (representatives of employers, educational organizations, public authorities) are involved in the procedure since it reflects expectations of employers from workers who come to workplaces with the units of learning outcomes they have mastered in an educational organization on the basis of the educational standards approved by official power structures.

The current paper describes the authors' experience in developing functional maps for qualification within the following VET study programme "Legislation and Social Protection", corresponding to Qualification level 5 in the Order of the Russian Ministry of Labour dated of the 12th of April, 2013, № 148n, "Levels of qualification for development of draft occupational standards". It should be noted that level 5, which is under consideration here, fully corresponds to level 5 of the European Qualification Framework (EQF). The authors' concept of using the functional analysis discussed in the paper contains six stages and the technology developed to create functional maps for qualifications. The content analysis of Federal state educational standards (FGOS) of post-secondary non-tertiary education and occupational standards equivalent to level 4 and 5 of EQF are used to explore intersections and difference between approaches of two types of standards. Modelling of work functions for development of functional maps of qualifications and a method of expert evaluations with involvement of employers as experts are used in the paper.

Results and Discussion

Functional analysis is the main tool used to determine the essence of a particular occupation and labour actions to be performed. It contains a pro-

cedure of identifying vocational competencies and establishing boundaries between qualifications. Functional analysis is intended to ensure a detailed understanding of what an employee should do in their work. Eventually, it facilitates identification of the learning outcomes for an individual to obtain a qualification [4].

It is important to identify all the general work functions (primary level of detail) and specific work functions (secondary level of detail) and to establish relationships between them within the considered qualification. Results of the functional analysis can be presented in the form of a functional map, which implies the following actions.

1. Identifying and analysing regulatory documents that establish requirements for the considered qualification (Federal State Educational Standards and National Occupational Standards)

To begin with, it is necessary to select Federal State Educational Standards regarding the training area, for which functional analysis is needed. One as well may consider the Guidance for developing basic study programmes and supplementary study programmes, in which occupational standards are given a special focus [5].

The next step is to identify the relevant occupational standard for the considered qualification. The list of occupational standards can be found on the official website of the Ministry of Labour www.profstandart.rosmintrud.ru, which includes the register and content of occupational standards. When searching for the occupational standard, a team of developers should take into account that the qualification within a specific VET study programme may correspond to:

- one occupational standard that has the same or synonymous name with the programme;
- a part of an occupational standard (for example, one of the general work functions described in it);
- several occupational standards, each reflecting for instance, the specifics of an industry or describing one of the qualifications that can be obtained within the study programme;
- none of the occupational standards.

Therefore, when selecting occupational standards, one should provide answers to the following questions:

1.1. Which occupational area is the functional analysis being developed for (its purpose and title)?

1.2. Which level of qualification is to be achieved within the programme (in accordance with the order № 148n of the Russian Ministry of Labour)?

1.3. Is there an occupational standard, the title of which corresponds to that of the study programme (in the register of occupational standards)?

1.4. Are there occupational standards with different titles but containing requirements for the chosen qualification?

2. Identifying the type of occupation (the goal of the occupation – what for?)

Once the key goal of the occupation is clear, a team of developers can move on to the next stage, that is, determine what should happen in order to achieve the identified key goal (a set of functions, which are discrete components of the qualification, the ones necessary to achieve the key goal).

3. Dividing the qualification into general work functions

Proceeding from the content analysis of regulative, technical and other documentation, and taking into account the specifics of the occupation in accordance with the employers' requirements (what in general is to be done to achieve the goal?), one should split the qualification into general work functions.

To identify the components necessary to achieve the key goal, one should turn to the occupational standards, which have been previously selected, and analyse the general work functions for the considered level of qualification.

There can be no right or wrong solution in identifying the general work functions as well as specific work functions. In various industrial sectors and occupations, functional analysis can be performed in different ways. Yet, identification of work functions tends to follow one of the following models:

- **a linear model** that separates the stages involved and displays them sequentially, for example, “identify specifications”, “design”, “build”;
- **a cyclic model** that separates the stages involved, but returns them to the starting point, for example, “plan”, “do”, “control”;
- **a process model** that outlines various types of processes involved, for example, “bake”, “cook”, “fry”;
- **a product model** that outlines various types of products or materials, for example “bricks”, “cement”, “plaster”, “wood”, “site”, “online course”.

A model to be used for developing a functional map depends on how the activity is carried out in a particular occupation. For instance, in many industries, the cycle of “plan”, “do” and “control” has proven itself as a very sensible approach. In other industries, employees can perform only specific processes, for example, they solder, but do not weld, so it makes sense to conduct functional analysis in accordance with the process model. In other sectors, employees can only work with certain products or materials, for example, they serve cars, but not motorcycles, trucks, but not buses. The infor-

mation concerning the specifics of the occupation can be obtained from direct contact with the employers.

Yet, one should bear in mind that any model (or variation of the model) taken as a basis, must follow the logic of functional analysis “What is to be done to achieve the key goal of the occupation?”. Functional map developers should not blindly follow what employers tell them. The analysis should not only have relevance for a specific industry, but it also needs to make logical sense and follow the initially defined model.

4. Dividing each general work function into specific work functions

Recall that a work function is a set of actions, grouped together due to the common goal, tasks, product of labour, methods and techniques of labour that an employee must perform.

When comparing VET federal state educational standards and occupational standards, one may find out the following:

- All the work functions are represented in the VET federal state educational standard. In this case, the functional map should be built in compliance with the allocated work functions, and units of learning outcomes should be developed according to the general work functions from the corresponding occupational standard(s), and, accordingly, to the activities described in the federal state educational standard;
- One or more of the considered work functions are not represented in the educational standard. In this case, a team of developers should develop units of learning outcomes according to the general work functions from the occupational standard(s), the list of functions being supplemented by that of vocational competencies described in the educational standard;
- The list of vocational competencies in the educational standard is much wider than that of work functions in the occupational standard(s) for the considered qualification. Therefore, the functional map should be built on the basis of vocational competencies from the educational standard, the list of functions being expanded by general universal skills from the educational standard and those recommended by the employers and VET practitioners.

5. Coordinating with the sector employers

A VET institution is obliged to update the main vocational study programmes annually (the scope of disciplines and professional modules established by the VET institution in the curriculum and/or the content of syllabi and professional modules, the programmes of production practice, ancillary materials, etc, so that they ensure implementation of the relevant educational technology), the employers’ demands being taken into account.

This coordination is to be carried out in two stages.

1. Distribution of questionnaires with a list of the study programme learning outcomes among the sector employers.

It is more efficient and expedient to collect the results of the survey personally, in order to find out from direct contact with the employers, what their specific expectations are.

2. Conduction of a focus group with several employers. By bringing representatives of the industry together and encouraging them to discuss the selected competencies (learning outcomes / work functions) it is usually possible to develop a list of commonly agreed titles and descriptions of functions, as well as to obtain the employers' common opinion as to the missing elements of the qualification.

6. Making a functional map in the form of a chart

Proceeding from the information obtained, it is possible to start developing a qualification functional map. Thus, vocational and universal skills (i. e., learning outcomes or work functions) as well as competencies proposed by the employers are grouped into units that correspond to general work functions.

Below you can see an example of a functional map designed for "Legislation and Social Protection" of level 5 EQF.

Case study. VET study programme "Legislation and Social Protection"

1. Identification and analysis of regulatory documents that establish requirements for the considered qualification (Federal State Educational Standards and National Occupational Standards)

Consider a VET study programme "Legislation and Social Protection". On the 26th of December 26, 2016 the Ministry of Education and Science of the Russian Federation approved the federal state educational standard of post-secondary vocational education and training for the VET study programme 40.02.01 **"Legislation and Social Protection"** with a regular term of study 3 years 10 months – for basic general education, and 2 years 10 months – for secondary general education.

Next, it is necessary to answer questions 1.1. – 1.4:

- The programme title is "Legislation and Social Protection".
- The qualification level is 5 (the qualification of a lawyer), which corresponds to the training of specialists in post-secondary vocational education.
- In our example, there is no corresponding occupational standard.
- Yes, there are parts of several occupational standards for this VET study programme in terms of skill level and requirements.

Thus, on the basis of the answers obtained, it is determined that certain parts of two occupational standards correspond to the chosen qualification:

1) "Specialist in organizing and establishing social payments", approved by the Ministry of Labour of Russia on the 28th of October, 2015 (hereinafter referred to as Occupational Standard № 1);

2) "Specialist in organizing the administration of insurance premiums", approved by the Ministry of Labour of Russia on the 28th of October, 2015 (hereinafter referred to as Occupational Standard № 2).

2. Identifying the type of occupation (the goal of occupation – what for?)

In order to determine what functions constitute the occupation of a lawyer in "Legislation and Social Protection", a team of developers should answer the question: "What for is the activity carried out?"

The VET federal state educational standard for the chosen VET study programme "Legislation and Social Protection" defines the field (type) of the occupational activity as **legislation regulation in social sphere; implementation of state obligations in pension provision, as well as state and municipal obligations in citizens' social protection**. This will be adopted as lawyer's key goal activities in "Legislation and Social Protection".

The VET federal state educational standard also identifies two types of activity for the considered qualification:

- Regulation of citizens' rights in the sphere of pension provision and social protection;
- Organizational management of social protection institutions and legal bodies of the Pension Fund of the Russian Federation.

3. Dividing the qualification into general work functions

Thus, for "Legislation and Social Protection" the following is obtained:

In the Occupational Standard № 1 we choose the information on the general work functions for level 5.

General Work Functions		
Code	Title	Level
A	Interacting with applicants on issues of granting social benefits	5

In the Occupational Standard № 2 we choose the information on the general work functions for level 5.

General Work Functions		
Code	Title	Level
A	Recording the information on payers of insurance premiums for compulsory pension insurance and compulsory medical and social insurance	5

Next, it is necessary to compare the general work functions with the types of activity that are formulated in the VET federal state educational standard. Formulations of the requirements in educational and occupational standards may not formally coincide; when comparing those, a team of developers should pay attention to their meaning in order to determine the objective nature of correlation.

The analysis has shown that the general work functions from both occupational standards correspond to two types of activity fixed in the educational standard, but they are formulated too generally and require detailing:

Type of activity (VET federal state educational standard)	General work function (Occupational standard)
Regulation of citizens' rights in the sphere of pension provision and social protection	Interacting with applicants on issues of granting social benefits (№ 1)
Organizational management of social protection institutions and legal bodies of the Pension Fund of the Russian Federation	Recording the information on payers of insurance premiums for compulsory pension insurance and compulsory medical and social insurance (№ 2)

Due to the fact that the VET study programme "Legislation and Social Protection" does not have a single occupational standard that would cover all the general work functions necessary to train a lawyer in this field, a decision is made, given the key goal of the occupation, that the activities listed in the VET federal state educational standard should be supplemented by one more activity that would cover the general universal skills related to the learning outcomes: **Personal and professional development as a Lawyer in the sphere of social protection.**

As a result, we get three types of activities:

- Regulation of citizens' rights in the sphere of pension provision and social protection;
- Organizational management of social protection institutions and legal bodies of the Pension Fund of the Russian Federation;
- Personal and professional development as a Lawyer in the sphere of social protection.

These activities are formulated too generally, and do not allow us to interpret them as general work functions. Therefore, following the process model of functional analysis, it is decided that those activities should be identified as "groups of general work functions", each being further subdivided into several general work functions:

Group of General Work Functions (GGWF)	General Work Function (GWF)
GGWF 1. Regulation of citizens' rights in the sphere of pension provision and social protection	GWF 1.1. Consulting clients
	GWF 1.2. Managing documents and records
GGWF 2. Organizational management of social protection institutions and legal bodies of the Pension Fund of the Russian Federation	GWF 2.1. Resource management
	GWF 2.2. ICT support
	GWF 2.3. HR management
GGWF 3. Personal and professional development as a Lawyer in the sphere of social protection	GWF 3.1. Self-Management
	GWF 3.2. Professional development and adherence to business etiquette

Each general work function, in turn, is subdivided into specific work functions, which, in most cases, though not always and not completely are expanded in occupational standards for the appropriate qualification level and must correspond to those skills that a learner develops within a course of the training programme.

4. Dividing each general work function into specific work functions

For "Legislation and Social Protection", the following actions are to be taken.

To begin with, in the Standard № 1 information on work functions is selected, which includes components of the general work functions for the qualification level 5.

Work Functions		
Title	Code	Level (sublevel)
Receive and register applications and documents	A/01.5	5
Issue documents on social benefits	A/02.5	

Next, the same is done with the Standard № 2.

Work Functions		
Title	Code	Level (sublevel)
Register, re-register and cancel payers	A/01.5	5
Maintain the register of payers in the system of pension and health insurance	A/02.5	
Communicate with tax authorities and justice bodies within the registration procedure in the system of state off-budget funds	A/03.5	
Maintain the payers' personal files	A/04.5	
Inform payers about the order of registration	A/05.5	

As the result, the work functions established in the considered occupational standards for “Legislation and Social Protection” do not fully correspond to those vocational competencies fixed in the educational standard.

Vocational Competencies (VET federal state educational standard)	Work functions (National occupational standard)
VC 1.1. Carry out professional interpretation of normative legal acts concerning regulation of citizens' rights in the sphere of pension provision and social protection	–
VC 1.2. Work with clients on issues of pension provision and social protection	A/01.5 Receive and register applications and documents (№ 1)
VC 1.3. Analyse packages of documents for granting pensions, compensations, and other benefits, as well as for taking measures of social support and protection in relation to particular categories of citizens	A/02.5 Issue documents on social benefits (№ 1)
VC 1.4. Perform the procedures of granting, recalculation, transfer, indexation and correction of pensions and other social benefits by means of ICT	A/01.5 Register, re-register and cancel payers
VC 1.5. File and store documents belonging to the recipients of pensions, compensations and other social benefits	A/04.5 Maintain the payers' personal files (№ 2)
VC 1.6. Consult citizens and representatives of legal bodies on issues of pension provision and social protection	A/05.5 Inform payers about the order of registration (№ 2)
VC 2.1. Support the databases containing recipients of pensions, compensations and other social benefits	A/01.5 Register, re-register and cancel payers (№ 2)
	A/02.5 Maintain the register of payers in the system of pension and health insurance (№ 2)
	A/03.5 Interact with tax authorities and justice bodies within the registration procedure in the system of state off-budget funds (№ 2)
VC 2.2. Identify individuals in need of social protection, and keep a record of them by means of ICT	–

Thus, since there is no uniform occupational standard for the chosen qualification, and the existing two occupational standards do not fully cover those vocational competencies fixed in the educational standard, it is decided that the functional map should be built on the basis of vocational competencies taken from the educational standard, the list being expanded by universal competencies.

Therefore, the following list of competencies (work functions / learning outcomes) is obtained for the qualification of a lawyer in “Legislation and Social Protection”:

- Carry out professional interpretation of normative legal acts concerning regulation of citizens’ rights in the sphere of pension provision and social protection (VC – 1.1);
- Receive clients on issues of pension provision and social protection (VC – 1.2);
- Analyse packages of documents for granting pensions, compensations, and other benefits, as well as for taking measures of social support and protection in relation to particular categories of citizens (VC – 1.3);
- Perform the procedures of granting, recalculation, transfer, indexation and correction of pensions and other social benefits by means of ICT (VC – 1.4);
- File and store documents belonging to the recipients of pensions, compensations and other social benefits (VC – 1.5);
- Consult citizens and representatives of legal bodies on issues of pension provision and social protection (VC – 1.6);
- Support the databases containing recipients of pensions, compensations and other social benefits (VC – 2.1);
- Identify individuals in need of social protection, and keep a record of them by means of ICT (VC – 2.2);
- Arrange and coordinate social work with the individuals, families and categories of citizens in need of social support and protection (VC – 2.3);
- Realise the essence and social significance of the profession, keep a permanent interest (UC-1);
- Organise one’s own activity; to choose standard methods and ways for professional tasks performance; to evaluate the efficiency and quality thereof (UC-2);
- Make decisions in regular and nonstandard situations; to bear responsibility for the outcomes of the decisions made (UC-3)
- Search and use the information necessary for efficient performance of professional tasks, professional and personal development (UC-4);

- Apply ICT in occupational activity (UC-5);
- Work in a team; communicate efficiently with colleagues, executives, and clients (UC-6);
- Bear responsibility for the work of team members (subordinates), as well as achievements and outcomes thereof (UC-7);
- Define independently the objectives of one's own professional and personal development, get oneself busy with self-education, plan one's own training (UC-8);
- Keep abreast of the constantly changing legislation system (UC-9);
- Observe the basics of a healthy lifestyle and labour protection requirements (UC-10);
- Adhere to business etiquette, psychological basics of communication and behavioural culture (UC-11);
- Demonstrate intolerance to corruption behaviour (UC-12).

This list of competencies (learning outcomes / work functions) should be further agreed with the employers, i.e. organizations, activity of which corresponds to the considered training programme. Given the feedback from the employers, the competencies (learning outcomes / work functions) should be specified and/or corrected and further integrated into units.

5. Coordinating with the sector employers

For "Legislation and Social Protection", a questionnaire containing questions for agreement might look as follows.

Learning Outcomes / Work Functions	Level of Importance		
	Very important	Less important	The least important
Carry out professional interpretation of normative legal acts concerning regulation of citizens' rights in the sphere of pension provision and social protection (VC – 1.1)			
Work with citizens on issues of pension provision and social protection (VC – 1.2)			
Analyse packages of documents for granting pensions, compensations, and other benefits, as well as for taking measures of social support and protection in relation to particular categories of citizens (VC – 1.3)			
Perform the procedures of granting, recalculation, transfer, indexation and correction of pensions and other social benefits by means of ICT (VC – 1.4)			
File and store documents belonging to the recipients of pensions, compensations and other social benefits (VC – 1.5)			
Consult citizens and representatives of legal bodies on issues of pension provision and social protection (VC – 1.6)			

Learning Outcomes / Work Functions	Level of Importance		
	Very important	Less important	The least important
Support databases containing recipients of pensions, compensations and other social benefits (VC – 2.1)			
Identify individuals in need of social protection and keep records of them by means of ICT (VC – 2.2)			
Arrange and coordinate social work with the individuals, families and categories of citizens in need of social support and protection (VC – 2.3)			
Realize the essence and social significance of the profession, keep a permanent interest(UC-1)			
Organise one's own activity; choose standard methods and ways for professional tasks performance; evaluate the efficiency and quality thereof (UC-2)			
Make decisions in regular and nonstandard situations; bear responsibility for the outcomes of the decisions made (UC-3)			
Search and use the information necessary for efficient performance of professional tasks, professional and personal development (UC-4)			
Apply ICT in occupational activity (UC-5)			
Work in a team; communicate efficiently with colleagues, executives, and clients (UC-6)			
Bear responsibility for the work of team members (subordinates), as well as achievements and outcomes thereof (UC-7)			
Define independently the objectives of one's own professional and personal development, get oneself busy with self-education, plan one's own training (UC-8)			
Keep abreast of the constantly changing legislation system (UC-9)			
Observe the basics of healthy lifestyle and labour protection requirements (UC-10)			
Adhere to business etiquette, psychological basics of communication and behavioural culture (UC-11)			
Demonstrate intolerance to corruption behaviour (UC-12)			
Learning Outcomes / Work functions, which are not listed but relevant for the considered qualification			
1.			
2.			
3.			
4.			

The survey conducted has shown that employers agree with the entire list of the proposed learning outcomes, and to the number of positions being

added by a team of developers – “Plan and manage work of different departments within social protection institutions”. Denote it as EC-1.

7. Functional mapping

Aim: legislation regulation in social sphere; implementation of state obligations in pension provision, as well as state and municipal obligations in citizens’ social protection.

Group of General Work Functions (GGWF)	General Work Function (GWF)	Specific Work Function (WF)
1	2	3
GGWF 1. Regulation of citizens’ rights in the sphere of pension provision and social protection	GWF 1.1. Consulting clients	WF 1. Carry out professional interpretation of normative legal acts concerning regulation of citizens’ rights in the sphere of pension provision and social protection (VC – 1.1)
		WF 2. Receive clients on issues of pension provision and social protection (VC – 1.2)
		WF 3. Consult citizens and representatives of legal bodies on issues of pension provision and social protection (VC – 1.6)
	GWF 1.2. Managing documents and records	WF 4. Perform the procedures of granting, recalculation, transfer, indexation and correction of pensions and other social benefits by means of ICT (VC – 1.4)
		WF 5. File and store documents belonging to the recipients of pensions, compensations and other social benefits (VC – 1.5)
		WF 6. Analyse packages of documents for granting pensions, compensations, and other benefits, as well as for taking measures of social support and protection in relation to particular categories of citizens (VC – 1.3)
GGWF 2. Organizational management of social protection institutions and legal bodies of the Pension Fund of the Russian Federation	GWF 2.1. Resource management	WF 7. Support databases containing recipients of pensions, compensations and other social benefits (VC – 2.1)
		WF 8. Identify individuals in need of social protection and keep a record of them by means of ICT (VC – 2.2.)
		WF 9. Arrange and coordinate social work with the individuals, families and categories of citizens in need of social support and protection (VC – 2.3)
	GWF 2.2. ICT support	WF 10. Apply ICT in occupational activity (UC-5)
		WF 11. Keep abreast of the constantly changing legislation system (UC-9)
		WF 12. Search and use the information necessary for efficient performance of professional tasks, professional and personal development (UC-4)
	GWF 2.3. HR management	WF 16. Bear responsibility for the work of team members (subordinates), as well as achievements and outcomes thereof (UC-7)

1	2	3
GGWF 3. Personal and professional development as a Lawyer in the sphere of social protection		WF 17. Work in a team; communicate efficiently with colleagues, executives, and clients (UC-6)
		WF 18. Make decisions in regular and nonstandard situations; bear responsibility for the outcomes of the decisions made (UC-3)
		WF 19. Plan and manage work of different departments within social protection institutions (EC-1)
	GWF 3.1. Self-Management	WF 13. Organize one's own activity; choose standard methods and ways for professional tasks performance; evaluate the efficiency and quality thereof (UC-2)
		WF 14. Define independently the objectives of one's own professional and personal development, get one-self busy with self-education, plan one's own training (UC-8)
		WF 15. Observe the basics of a healthy lifestyle and labour protection requirements (UC-10)
	GWF 3.2. Professional development and adherence to business etiquette	WF 20. Demonstrate intolerance to corruption behaviour (UC-12)
		WF 21. Realise the essence and social significance of the profession, keep a permanent interest (UC-1)
		WF 22. Adhere to business etiquette, psychological basics of communication and behavioural culture (UC-11)

The abbreviations used stand for the following:

- UC = Universal Competence taken from the educational standard and approved by the employers;
- VC = Vocational Competency taken from the educational standard and approved by the employers;
- EC = Employers' Competency taken from the Employers' review.

Discussion and conclusions

The case illustrated the developed procedures in the current paper obviously do not cover all possible variants of functional mapping. The final result always depends on the scope of functional analysis, which, in its turn, depends on the specifics of the qualification and the work functions that should be accounted for. Thus, in order to ensure the work functions meet the employers' needs, a team of developers should not think of a functional map as of a static document. The analysis of the sector/occupation is to be constantly monitored and regularly updated. If properly maintained, it will provide a reliable background for those who develop and maintain national occupational standards, state educational standards and finally, VET study programmes.

The developed procedure of functional analysis and technology of creation of functional maps of qualifications are instruments for ensuring transparency of qualifications, which allows us to break VET study programmes into units of learning outcomes with the corresponding number of allocated ECVET points measuring its significance in the whole qualification. The procedure developed above is ready for implementation in Russian VET and has been successfully tested with several qualifications at level 4 and 5 of EQF such as welders, electricians, hotel managers, etc.

In the long term, introduction of the research results into practice of creation and modernisation of VET study programmes will be a factor of increasing competitiveness of such programmes in national and international labour market and educational services. It should also be one of the main factors of increasing academic and professional mobility and for improving opportunities of lifelong learning.

References

1. Dremina M. A., Kopnov V. A., Golubeva T. A. ECVET Units of Learning Outcomes. *Rol' nacional'nyh kvalifikacionnyh ramok v reformirovanie vysshego obrazovaniya i SSPO. Sbornik nauchno-metodicheskikh statej = The Role of NQF in the reform of Higher Education and VET System. Collected Scientific-Methodological Writings*. Tashkent; 2017. p. 9–27. (In Russ.)
2. Alsharari N. M. Internationalization of the higher education system: An interpretive analysis. *International Journal of Educational Management*. 2018; 32 (3): 359–381.
3. Aksenova N. M., Golubeva T. A., Muravyeva A. A., Oleinikova O. N., Sartakova E. V. *Zachetnye edinicy v srednem professional'nom obrazovanii = Credits in VET*. Moscow: Publishing House Universitetskaya kniga; 2016. 156 p. (In Russ.)
4. Carroll G., Boutall T. Guide to developing national occupational standards: Revised June 2011. Retrieved 2018, from UK Commission for Employment and Skills [Internet]. [cited 2018 Apr 03]. Available from: <http://webarchive.nationalarchives.gov.uk/20140108130816/http://www.ukces.org.uk/assets/ukces/docs/supporting-docs/nos/nos-guide-for-%20developers-2011.pdf>
5. Guide to developing a sector qualification strategy including: functional mapping, a competence, skills & knowledge framework, a quality assurance process [Internet]. European Observatoire of Sport and Employment (EOSE) – EQF-Sports; 2007–2008 [cited 2018 Apr 03]. 31 p. Available from: <http://eose.org/wp-content/uploads/2007/01/Guide-LLL-Strategy-EN.pdf>
6. Kopnov V., Papaloizou L. RUECVET: Piloting ECVET to the national VET system of Russia and Uzbekistan. *The ECVET Magazine* [Internet]. 2018 [cited 2018 May 03]: 31: 14–17. Available from: http://www.ecvet-secretariat.eu/en/system/files/magazines/en/ecvet_mag_31.pdf
7. Spöttl G. Permeability between VET and higher education – a way of human resource development. *European Journal of Training and Development*. 2013 May; Vol. 37, Issue 5: 454–471.

8. Mansfield B., Schmidt H. Linking vocational education and training standards and employment requirements – An international manual [Internet]. Turin: European Training foundation; 2001 [cited 2018 Apr 03]. 90 p. Available from: [http://www.etf.europa.eu/pubmgmt.nsf/\(getAttachment\)/1B0D23E77876D6F7C12571FE00473D6B/\\$File/NOTE6UAEET.pdf](http://www.etf.europa.eu/pubmgmt.nsf/(getAttachment)/1B0D23E77876D6F7C12571FE00473D6B/$File/NOTE6UAEET.pdf)
9. Krichewsky L. Les dispositifs de validation et de reconnaissance des compétences acquises dans le cadre d'une mobilité: un révélateur de l'internationalisation du système de formation professionnelle en Allemagne. *Journal Int Mobil.* 2016; 4 (1): 75–90.
10. Pilz M., Li J., Canning R., Minty S. Modularisation approaches in Initial Vocational Education: evidence for policy convergence in Europe? *Journal of Vocational Education and Training* [Internet]. 2016 [cited 2018 Apr 03]. Available from: <https://doi.org/10.1080/13636820.2017.1392994>; <http://www.cedefop.europa.eu/en/publications-and-resources/publications/5556>
11. de Paor C. Supporting change in VET: Teachers' professional development and ECVET learner mobility. *Empirical Research in Vocational Education and Training* [Internet]. 2018 [cited 2018 Apr 03]; 10 (1): 1. Available from: <https://doi.org/10.1186/s40461-017-0062-3>
12. Defining, writing and applying learning outcomes: A European handbook [Internet]. Luxembourg: Publications Office, 2017 [cited 2018 Apr 03]. Available from: <http://dx.doi.org/10.2801/566770>
13. Mansfield B., Schmidt H. Svyaz' mezhdu standartami professional'nogo obrazovaniya, obucheniya i trebovaniyami rabochego mesta. Mezhdunarodnoe rukovodstvo = Linking vocational education and training standards and employment requirements: An international manual. Minsk; 2001. 93 p. (In Russ.)
14. Almeida C. Liviu Moldovan. Mobile learning methodology for European trainers and VET systems quality improvement. *Procedia Technology.* 2014; 12: 646–653.
15. Riela A., Tichkiewitcha S., Stolfab J., Stolfab S., Kreiner Ch., Messnarzd R., Rodic M. Industry-academia cooperation to empower automotive engineering designers. *Procedia CIRP.* 2016; 50: 739–744.
16. Savaa S., Borcaa C., Danciu L. Models of quality assurance in evaluation and validation of competencies, for an easier access to higher education *Procedia. Social and Behavioral Sciences.* 2014; 142: 176–182.
17. Kovácsa Z., Pató B. Jobs and Competency Requirements in Supply Chains. *Procedia Social and Behavioral Sciences.* 2014; 109: 83–91.
18. Konovalova Y. Functional analysis as a tool for determining learning outcomes in the design of modular-competence educational programs. *Obrazovanie i nauka = The Education and Science Journal.* 2008; № 1 (49): 27–35. (In Russ.)
19. Oleynikova O. N., Muravyeva A. A., Konovalova Y. V. Analiz potrebnosti v umeniyah = Analysis of the need for skills. Moscow: Publishing House Alfa-M; 2005. 142 p. (In Russ.)
20. Professional'nye standarty kak osnova podgotovki konkurentosposobnyh rabotnikov = Occupational standards as a basis for the preparation of competitive workers. Moscow: Publishing House Alfa-M; 2007. 160 p. (In Russ.)

Список использованных источников

1. Дремина М. А., Копнов В. А., Голубева Т. А. Единицы результатов обучения ECVET // Роль национальных квалификационных рамок в реформирование высшего образования и ССПО: сборник научно-методических статей. Ташкент, 2017. С. 9–27.
2. Alsharari N. M. Internationalization of the higher education system: an interpretive analysis. *International Journal of Educational Management*. 2018. Vol. 32 (3). P. 359–381.
3. Аксенова Н. М., Голубева Т. А., Муравьева А. А., Олейникова О. Н., Сартакова Е. В. Зачетные единицы в среднем профессиональном образовании. Москва: Университетская книга, 2016. 156 с.
4. Carroll G., Boutall T. Guide to developing national occupational standards: Revised June 2011. Retrieved 2018, from UK Commission for Employment and Skills. Available from: <http://webarchive.nationalarchives.gov.uk/20140108130816/http://www.ukces.org.uk/assets/ukces/docs/supporting-docs/nos/nos-guide-for-%20developers-2011.pdf> (дата обращения: 03.04.2018)
5. Guide to developing a sector qualification strategy including: functional mapping, a competence, skills & knowledge framework, a quality assurance process. European Observatoire of Sport and Employment (EOSE) – EQF-Sports; 2007–2008. 31 p. Available from: <http://eose.org/wp-content/uploads/2007/01/Guide-LLL-Strategy-EN.pdf> (дата обращения: 03.04.2018)
6. Kopnov V., Papaloizou L. RUECVET: Piloting ECVET to the national VET system of Russia and Uzbekistan. *The ECVET Magazine*. 2018. № 31. P. 14–17. Available from: http://www.ecvet-secretariat.eu/en/system/files/magazines/en/ecvet_mag_31.pdf (дата обращения: 03.05.2018)
7. Spöttl G. Permeability between VET and higher education – a way of human resource development. *European Journal of Training and Development*. 2013, May. Vol. 37, Issue 5. P. 454–471.
8. Mansfield B., Schmidt H. Linking vocational education and training standards and employment requirements – An international manual. Turin: European Training foundation, 2001. 90 p. Available from: [http://www.etf.europa.eu/pubmgmt.nsf/\(getAttachment\)/1B0D23E77876D6F7C12571FE00473D6B/\\$File/NOTE6UAEET.pdf](http://www.etf.europa.eu/pubmgmt.nsf/(getAttachment)/1B0D23E77876D6F7C12571FE00473D6B/$File/NOTE6UAEET.pdf) (дата обращения: 03.04.2018)
9. Krichewsky L. Les dispositifs de validation et de reconnaissance des compétences acquises dans le cadre d'une mobilité: un révélateur de l'internationalisation du système de formation professionnelle en Allemagne. *Journal Int Mobil*. 2016. № 4 (1). P. 75–90.
10. Pilz M., Li J., Canning R., Minty S. Modularisation approaches in Initial Vocational Education: evidence for policy convergence in Europe? *Journal of Vocational Education and Training*. 2016. Available from: <https://doi.org/10.1080/13636820.2017.1392994>; <http://www.cedefop.europa.eu/en/publications-and-resources/publications/5556> (дата обращения: 03.04.2018)
11. de Paor C. Supporting change in VET: Teachers' professional development and ECVET learner mobility. *Empirical Research in Vocational Education*

and Training. 2018. № 10 (1). P. 1. Режим доступа: <https://doi.org/10.1186/s40461-017-0062-3> (дата обращения: 03.04.2018)

12. Defining, writing and applying learning outcomes: A European handbook. Luxembourg: Publications Office, 2017. Available from: <http://dx.doi.org/10.2801/566770> (дата обращения: 03.04.2018)

13. Мэнсфилд Б., Шмидт Х. Связь между стандартами профессионального образования, обучения и требованиями рабочего места: международное руководство. Минск, 2001. 93 с.

14. Almeida C. Liviu Moldovan. Mobile learning methodology for European trainers and VET systems quality improvement. *Procedia Technology*. 2014, № 12. P. 646–653.

15. Riela A., Tichkiewitcha S., Stolfab J., Stolfab S., Kreiner Ch., Messnarzd R., Rodic M. Industry-academia cooperation to empower automotive engineering designers. *Procedia CIRP*. 2016. № 50. P. 739–744.

16. Savaa S., Borcaa C., Danciu L. Models of quality assurance in evaluation and validation of competencies, for an easier access to higher education *Procedia. Social and Behavioral Sciences*. 2014; 142: 176–182.

17. Kovácsa Z., Pató B. Jobs and Competency Requirements in Supply Chains. *Procedia Social and Behavioral Sciences*. 2014. № 109. P. 83–91.

18. Коновалова Ю. В. Профессиональные стандарты как основа разработки структуры и содержания стандартов профессионального образования и модульных образовательных программ // *Образование и наука*. 2008. № 1 (49). P. 27–35.

19. Олейникова О. Н., Муравьева А. А., Коновалова Ю. В. Анализ потребности в умениях: методическое пособие. Москва: Альфа-М, 2005. 142 с.

20. Профессиональные стандарты как основа подготовки конкурентоспособных работников: методическое пособие. Москва: Альфа-М, 2007. 160 с.

Information about the authors:

Vitaly A. Kopnov – Doctor of Engineering, Professor, Advisor, Russian State Vocational Pedagogical University, Yekaterinburg, Russia. E-mail: vitalij.kopnov@rsvpu.ru

Olga V. Shmurygina – Candidate of Philosophical Sciences, Associate Professor, Department of Law, Russian State Vocational Pedagogical University, Yekaterinburg, Russia. E-mail: shmur-olga@yandex.ru

Maria A. Dremina – Candidate of Sociological Sciences, Associate Professor, Department of Management, Russian State Vocational Pedagogical University, Yekaterinburg, Russia. E-mail: mdryomina@yandex.ru

Dina E. Shchipanova – Candidate of Psychological Sciences, Associate Professor, Department of Education Psychology and Professional Development, Russian State Vocational Pedagogical University, Yekaterinburg, Russia. E-mail: dina_evg@mail.ru

Louiza Papaloizou – Project Manager, Intercollege European Office, Intercollege, Nicosia, Cyprus. E-mail: papaloizou.l@intercollege.ac.cy

Patriks Morevs – Head of Foreign Affairs Department, Liepaja University, Liepaja, Latvia. E-mail: acentrs@liepu.lv

Received 21.01.2018; accepted for publication 16.05.2018.

The authors have read and approved the final manuscript.

Информация об авторах:

Копнов Виталий Анатольевич – доктор технических наук, профессор, советник ректора Российского государственного профессионально-педагогического университета, Екатеринбург, Россия. E-mail: vitalij.kopnov@rsvpu.ru

Шмурыгина Ольга Владимировна – кандидат философских наук, доцент кафедры права Российского государственного профессионально-педагогического университета, Екатеринбург, Россия. E-mail: shmur-olga@yandex.ru

Дремина Мария Анатольевна – кандидат социологических наук, доцент кафедры менеджмента Российского государственного профессионально-педагогического университета, Екатеринбург, Россия. E-mail: mdryomina@yandex.ru

Щипанова Дина Евгеньевна – кандидат психологических наук, доцент кафедры психологии образования и профессионального развития Российского государственного профессионально-педагогического университета, Екатеринбург, Россия. E-mail: dina_evg@mail.ru

Луиза Папалуиза – проектный менеджер Европейского офиса Интерколледжа, Никосия, Кипр. E-mail: papaloizou.l@intercollege.ac.cy

Яна Орфанидоу – заместитель руководителя департамента гостеприимства, туризма и спортивного менеджмента Бизнес-школы Университета Никосии, Никосия, Кипр. E-mail: orphanidou.y@unic.ac.cy

Патрик Морев – руководитель международного отдела Университета Лиепая, Лиепая, Латвия. E-mail: acentrs@liepu.lv

Статья поступила в редакцию 21.01.2018; принята в печать 16.05.2018.

Авторы прочитали и одобрили окончательный вариант рукописи.