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## **RAPORT 06**

**Implementation of the FINECVET model to the formal and nonformal education** Wdrażanie modelu FINECVET w edukacji formalnej i pozaformalnej

## **RESULT 06 - REPORT**

### **ICT tool platform for the evaluation and actualisation the learning outcomes in the professions: Child Care Workers and Health Care Assistants**

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Projekt Erasmus+ „*Implementation of the FINECVET model to the formal and nonformal education*”

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Institute For Sustainable Technologies – National Research Institute, Poland

#### **In cooperation with:**

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## TABLE OF CONTENTS

1. Introduction .....	3
2. Development the draft of the ICT tool .....	4
3. Entering data from the base of descriptions of qualifications and units of learning outcomes for the occupations Child Care Worker and Health Care Assistant .....	12
4. Testing and verification of the ICT tool with participation of representatives of the partnership and the target group within the framework of a pilot implementation .....	13
5. Development the recommendations in the scope of programme offer for nonformal education in the profession: Child Care Workers and Health Care Assistants.....	14
6. Conclusions .....	14
7. References .....	14

## 1. INTRODUCTION

The report O6 - ICT tool platform for the evaluation and actualisation the learning outcomes in the professions: Child Care Workers and Health Care Assistants is a further result of the project *"Implementation of the FINECVET model to the formal and nonformal education TRANS-FINECVET"*. The institution which conducted the action was Institute for Sustainable Technologies - National Research Institute (ITeE-PIB).

To achieve the goal the actions have been taken the descriptions of which are included in this report.

Developed in the TRANS-ECVET project the ICT tool is an interactive web platform coupled with a database the task of which is to support management of learning outcomes in professions (occupations): "Child care worker" and "Heath care assistant".

The ICT tool provides support for processes of creation, update, and evaluation of qualifications and units of learning outcomes in terms of adaptation of learning offer to the needs of labour market and requirements of the ECVET system.

The point of reference for the developed ICT tool, were reports on comparative studies in three partner countries (Finland, Poland, Spain) that concerned:

- standards of professional competences for the two professions (result O1),
- ECVET systems that are used in the partner countries participating in the project (result O3),
- education programs for the specific professions (result O4),
- descriptions of qualifications and units of learning outcomes (result O5).

The ICT tool will be used by the project partners and target groups that are interested in developing of competences in professions "Child care worker" and "Health care assistant", especially teachers of vocational schools and training centers, students and staff, methodologists and professional advisors, institutions involved in developing qualifications, employers and those aged 50+, women returning to labour market, teachers at risk of losing their jobs.

## 2. Development the draft of the ICT tool

It was assumed that the developed tool would be a solution based on information technologies, and it would be possible to use it from generally available web browsers. Key elements of the IT tool are "qualifications", "units of learning outcomes" and "learning outcomes". These terms are consistent with the recommendations on "European Qualifications Framework for Lifelong Learning " (EQF) and "European Credit System for Vocational Education and Training" (ECVET) - Table 1.

Table 1.: Key terms used in the tool ICT

Notion	Definition	Definition by	
		EQF	ECVET
<b>Qualification</b>	Formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards. <i>In the project, the qualification is logically separated component of description of competence requirements for a profession</i>	X	X
<b>Unit of learning outcome</b>	Component of a qualification, consisting of a coherent set of knowledge, skills and competence that can be assessed and validated		X
<b>Learning outcomes</b>	Statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence.	X	X

Two operational terms have been defined, that determine in the ICT tool basis of its functionality, i.e.:

- Monitoring of requirements for qualifications separated from profession – Systematically carried out process of reviewing and updating base of qualifications developed in partnership, which are separated for given profession ("Child Care Worker" and "Health Care Assistant"), which consists of collection of units of learning outcomes and corresponding detailed learning outcomes;
- Evaluation of learning outcomes for qualifications separated from profession – self-assessment process (on input and output of the educational process) of learner (or employee) on achieved learning outcomes relevant to qualification separated in profession ("Child Care Worker" and "Health Care Assistant") and / or assessment of learner by teacher (or assessment of employee by supervisor) for the scope of achieved learning outcomes relevant to the qualification in the profession.

The basis for the implementation work was the model for update and evaluation of learning outcomes in professions "Child care worker" and "Health care assistant" (Fig. 1).

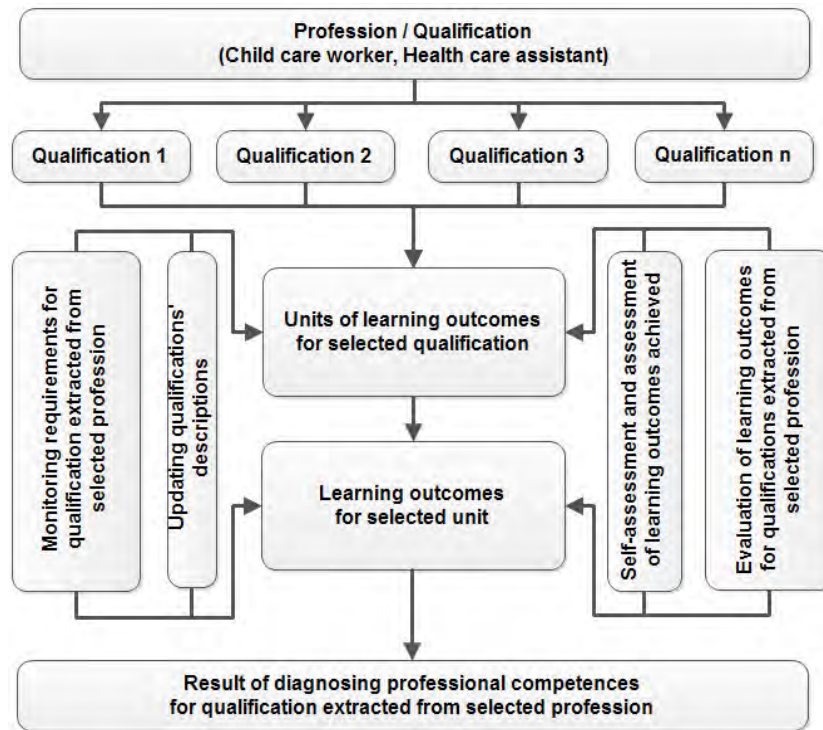


Fig. 1. Model for update and evaluation of learning outcomes in professions "Child care worker" and "Health care assistant"

Based on the analysis of the model the structural model of the ICT tool to update and evaluation of learning outcomes in professions "Child Care Worker" and "Health Care Assistant" was proposed, which is shown in Fig. 2.

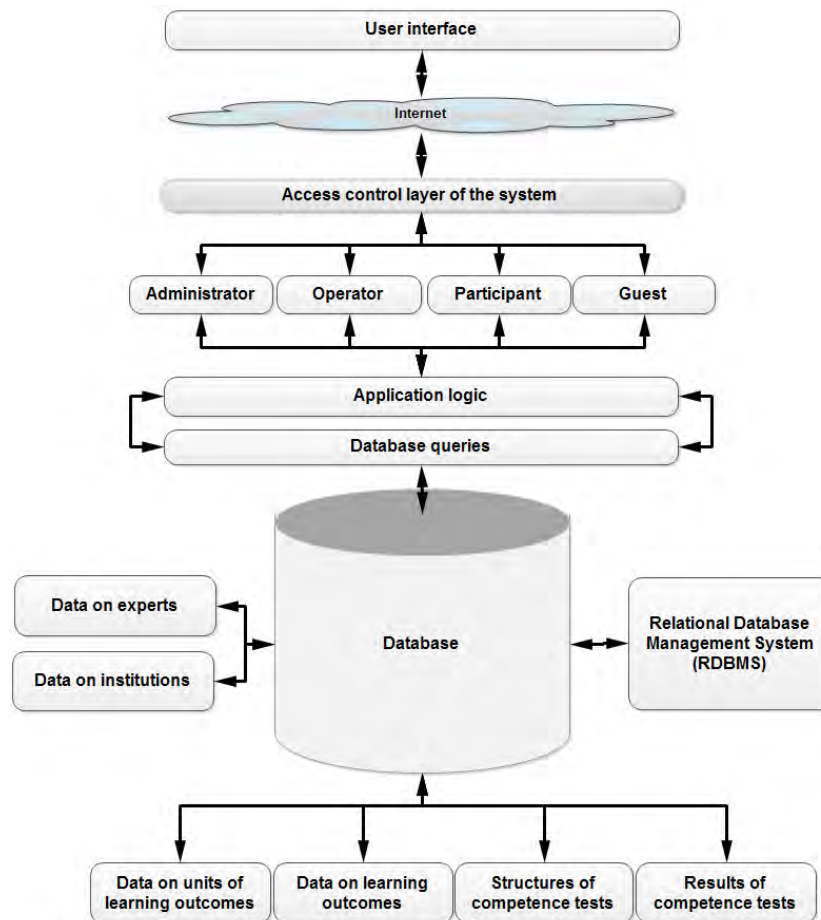


Fig. 2. Structural model of the ICT tool to update and evaluation of learning outcomes in professions „Child Care Worker” and „Heath Care Assistant”

The structural model of the ICT tool was the basis for implementation of individual components of the system.

### User Interface of ICT tool and access to database resources

One of the elements of the information system is a user interface that is designed for presentation of data in environment of web browsers. With the use of the user interface it is possible to perform following operations:

- registration and update (by users that are authorized for this) data on qualification requirements in selected professions,
- browse of data according to preset criteria,
- modification of selected static elements of the user interface,
- carry out competence tests and identification of training needs,
- print of data that are presented by web browser,
- registration of users (persons or institutions) that are interested in use of the ICT tool.

User Interface, which part is a menu provides access to individual system modules. Appearance of the user interface, as an example of the main screen of the ICT tool is shown in Fig. 3.

**Implementation of the FINECVET model to the formal and nonformal education**

Project: 2014-1-PL01-KA202-003355

**Competences catalogue**

Competences Catalogue is to enable contact between institutions interested in implementation of ICT tools, including institutions:

- which have already implemented ICT tools in "Child Care Worker" or "Health Care Assistant" professions and intend to expand existing directory;
- they intend to use the existing directory as a model for developing similar directory for other qualifications / skills and professions;
- which intend to conduct trainings in the area of the qualifications listed above, or use eg. only part of the competences catalogue;

Because the developed tool can also be used in other professions, therefore this directory will make it easier to reach the institutions that have already developed a database of qualifications for other professions.

No.	Occupation title	Qualification title
1	Health Care Assistant	Care for the elderly
2	Child Care Worker	Children's and youth care and education
3	Child Care Worker	Clinical nursing and care
4	Health Care Assistant	Clinical nursing and care
5	Child Care Worker	Nursing and care
6	Health Care Assistant	Nursing and care
7	Health Care Assistant	Rehabilitation support
8	Child Care Worker	Rehabilitation support
9	Health Care Assistant	Support and guidance of growth
10	Child Care Worker	Support and guidance of growth

Fig. 3. Main screen of the ICT tool to update and evaluation of learning outcomes in professions „Child Care Worker” and „Heath Care Assistant”

Another element of the system is Access Control Module. This module includes the possibility to handle multiple users at the same time. Users of the system are divided into four groups:

- Administrator - creates and manages structure and database objects;
- Operator - can enter and update data on competence requirements in selected professions, and conducts tests for these professions;
- Participant - person/institution that is interested in browsing and searching data stored in the system, as well as conducting competence tests;
- Guest (unregistered user) - person/institution that is interested in carrying out tests of competence in a limited range.

Main element of the system is a module of application logic by means of which functions associated with data processing are carried out. This module performs among other things processes of assessing competences of persons who operate the system. Another element of the system is a database. In the database of the system, data on units of learning outcomes and learning outcomes that are associated with professions "Child care worker" and "Health care assistant" are stored. In addition, there are also stored structures of competence tests, and results of tests, as well as data on institutions and experts that participate in development of the ICT tool.

### Monitoring and update of qualification descriptions

For the purpose of modification of qualifications for professions "Child care worker" and "Health care assistant", special structures were developed. With their use it is possible to determine importance of individual units of learning outcomes and learning outcomes in sheets for diagnosis of competences. These structures constitute questionnaires in which proposals for modification of units of learning outcomes and learning outcomes are assessed in order to decide if the proposed amendment should be approved and made available to persons who are interested in carrying out test of competences. Fragment of structure in form of questionnaire which is designed to modify descriptions of qualifications is shown in Table 2.

Table 2. Fragment of questionnaire, which is designed to modify descriptions of units of learning outcomes in profession of "Child care worker"

<b>Qualification 1</b>						
<b>CHILD CARE WORKER – Support and guidance of growth</b>						
<b>No.</b>	<b>Name of unit learning outcomes</b>	<b>Scale of assessment (points and description)</b>				
		Very important	Important	Fairly important	Unimportant	Not At all
		5	4	3	2	1
1.1.	Takes care of clients' safety and anticipates potential safety risks and dangerous situations					
1.2.	Acts in accordance with provisions and operating principles for well-being and safety at work					

Proposals for changes in the content of the competence questionnaires can be expressed only by users with specific rights granted by system administrator. This solution reduces changes in the questionnaires made by persons / institutions with insufficient knowledge of the issues.

After entering proposals for changes in the structures of qualifications by authorized persons or institutions, the process of voting on the introduced changes according to adopted five-point scale (5 - change very important, 4 - change important 3 - change fairly important, 2 - change unimportant, 1 - change will not be assessed) is carried out. After collecting results,



the indicators of significance for specified units of learning outcomes are calculated. The indicators are the basis for update the requirements in the field of education suitable for chosen qualification in particular profession. Equation, according to which the significance of proposed changes of qualifications descriptions is determined is shown below.

$$W = \frac{\sum_{i=1}^n (L_i * i)}{\sum_{i=1}^n L_i} \quad (1)$$

where:

$W$  – indicator of significance of modifications concerning unit of learning outcome or learning outcome;

$n$  – maximum value of assessment ( $n=5$ );

$i$  – value of assessment according to adopted scale, where  $i \in N_+ \wedge i \in \{1; n\}$ ;

$L_i$  – number of respondents who gave assessment  $i$ ;

It was assumed that the higher value of the significance indicator the greater should be chance to introduce permanent changes in the qualification descriptions. The significance indicator of questionnaire modifications is compared with defined threshold, after exceeding which the proposition of change is considered as important. This threshold is defined by system administrator. Eventually, which units of learning outcomes remain in description of given qualification, decides a team of experts for a particular profession, which in their decisions should take into account the significance indicator.

According to the same principles the process of modification of descriptions of learning outcomes for specific units of learning outcomes is carrying out. Decision to approve proposed changes in descriptions of learning outcomes is taken similarly as for descriptions of units of learning outcomes. In this case, the significance indicator refers to learning outcomes of selected unit of learning outcomes.

### **Method of evaluation of competences on the basis of analysis of learning outcomes achieved**

Competences related to professions "Child Care Worker" and "Health Care Assistant" are tested using questionnaires made available to persons via internet platform of the ICT tool. An example screen with questionnaire designed to examine competences that relate to units of learning outcomes for profession "Health Care Assistant" is shown in Fig. 4. This questionnaire in terms of structure is similar to questionnaires used to modify the structure of qualification descriptions. In the questionnaires designed to assess level of mastery of learning outcomes also introduced a five level evaluation scale, however, descriptions for individual scale values are different (5 - very good, 4 - good, 3 - moderately well, 2 - not very well, 1 - not at all). The questionnaires from the assumption are designed to conduct self-assessment by people interested in verification of competences. Self-assessment can be done at the "input" to system of education / training for specific qualification, as well as at the "output", i.e. when the education / training is finished. With the use of result of

competence tests at the two stages it is possible to estimate progression associated with growth achieved within education / training.

After filling out the questionnaire by a person who wants to check competences, the result of the evaluation is presented. The result is information on whether the person tested is competent to perform the job, which concerned the questionnaire, as well as it is a list of units of learning outcomes for which the person should fill knowledge gaps or improve skills.

**Erasmus+ COMPETENCE TESTING**

Project: 2014-1-PL01-KA202-003355

**Implementation of the FINECVET model to the formal and nonformal education**

Project: 2014-1-PL01-KA202-003355

**Employee's training needs (Evaluation) Qualification requirements for employee**

Occupation title: **Health Care Assistant**  
Qualification title: **Care for the elderly**

Occupation code: **JEK 5**

1.000 questions - 40000 points (24 7140150)

You are not logged in. Anonymous users possess limited access to questionnaires. The underneath questionnaire does not contain the following parts: 'Units of learning outcomes catalogue for Learning output units'

**How can you perform the following units of learning outcomes – assess**

No.	Units of learning outcomes	Very well	Well	Fairly well	Not well	Not at all
		5	4	3	2	1
<b>Unit</b>						
Unit-1	Abiding with the ethical principles and quality recommendations in the care for the elderly and develops care for the elderly	•	•	•	•	•
Unit-2	Planning, implementing and assessing the care of and services to the elderly, taking their resources and participation into account	•	•	•	•	•
Unit-3	Using his/her vocational interaction skills in working with the elderly and their families	•	•	•	•	•
Unit-4	Guiding and supporting the elderly in daily activities, adopting a rehabilitative approach	•	•	•	•	•

Rys. 4. Screen of the ICT tool with questionnaire designed to examine competences relating to units of learning outcomes for the profession "Health Care Assistant"

The result is also information on need for educational training / courses in order to acquire specific competences. In order to determine the final result, the points for answers to all questions included in the questionnaire are summed up in the computer system. Then, coefficient of mastery of competences for profession is determined, according to equation (2).

$$S = \frac{\sum_{i=1}^m k_i}{m * n} * 100\% \quad (2)$$

where:

$S$  – coefficient of mastery of competencies for profession;

$n$  – maximum value of assessment ( $n=5$ );

$m$  – number of questions in questionnaire;

$i$  – order number of question in questionnaire;

$k_i$  - value of assessment for  $i$ -th question, where  $i \in N_+ \wedge i \in <1; n>$ ;

Reached the maximum number of points is information that person tested has full range of competences (coefficient of competences mastery  $S = 100\%$ ) related to the profession. It also means that person who is subjected to self-assessment, selected answer "Very well" for all items contained in questionnaire.

Adopted six levels of mastery of competences, which are shown in table 3.

Table 3. Levels of mastery of competences implemented in the ICT tool

Range of factor of competences mastery	Description
95% - 100%	Person mastered the competences very good, and does not have to complement them
90% – 94,99%	Person is competent, but may improve selected competences
85% - 89,99%	Person is competent, but should plan how to improve selected competences
80% - 84,99%	Person ceases to be competent and should complement competences
75% - 79,99%	Person in indicated range ceases to be competent and should immediately complete competences
< 75%	Person is not competent, and it is required to supplement competences.

People who are logged in the computer system (administrators, operators, participants) have access to more complete version of questionnaires in relation to persons / institutions not logged (guests), where in addition to questions that relate to units of learning outcomes, there are all learning outcomes included in individual units. Rules and scale of adopted levels for the coefficient of mastery of competencies for these questionnaires are the same as for questionnaires that contain only units of learning outcomes.

### **3. Entering data from base of qualification descriptions of units of learning outcomes for occupations Child Care Worker and Health Care Assistant to the ICT tool**

In order to provide required information to the database of the system, materials that included descriptions of units of learning outcomes and learning outcomes related to professions "Child Care Worker" and "Health Care Assistant" were prepared. The materials were translated into languages of partners that participated in the project, i.e., Finnish, Polish, Spanish, and English, which provided ability to use the ICT tool for a wide target recipients. Entries in English have been adopted in accordance with translation from Finnish language developed by the Finnish Ministry of Education.

Basis of qualification descriptions in the form of the database of units of learning outcomes and learning outcomes for professions "Child Care Worker" and "Health Care Assistant" was the Finnish model. From the model extracted structure associated with profession "Child Care Worker" that included such qualifications as: "Support and guidance of growth", "Nursing and care", "Rehabilitation support", "Children and youth care and education". From the model extracted also structure associated with profession "Health Care Assistant" that included such qualifications as: "Support and guidance of growth", "Nursing and care", "Rehabilitation support", "Clinical nursing and care", "Care for the elderly".

To the database of the ICT tool for profession "Child Care Worker" entered information concerning 60 units of learning outcomes, including:

- Support and guidance of growth – 13 units,
- Nursing and care – 16 units,
- Rehabilitation support – 14 units,
- Children and youth care and education – 17 units.

For this profession to the database also entered information concerning 163 learning outcomes, including:

- Support and guidance of growth – 34 outcomes,
- Nursing and care – 43 outcomes,
- Rehabilitation support – 28 outcomes,
- Children and youth care and education – 58 outcomes.

Similarly, for profession "Health Care Assistant" to the database of the ICT tool entered information concerning 72 units of learning outcomes, including:

- Support and guidance of growth – 13 units,
- Nursing and care – 16 units,
- Clinical nursing and care – 14 units,
- Rehabilitation support – 14 units,
- Care for the elderly – 15 units.

For this profession to the database also entered information concerning 249 learning outcomes, including:

- Support and guidance of growth - 46 outcomes,
- Nursing and care – 55 outcomes,
- Clinical nursing and care – 66 outcomes,
- Rehabilitation support – 33 outcomes,
- Care for the elderly – 49 outcomes.

Information for the database of the ICT tool have been developed by all partners of the project, where process of entering data into the computer system was carried out by the Institute for Sustainable Technologies.

#### **4. Testing and verification of the ICT tool with participation of representatives of the partnership and the target group within the framework of a pilot implementation**

Testing of the ICT tool was conducted with participation of the partners and a select group of users, which made it possible to identify problems associated with its functionality. Tests of the system with participation of users having different levels of rights allowed stating what could potentially impede work with the system, and which modules need to be changed.

Assessment covered all functional modules of the tool:

- Form for registration of institutions and experts („Participation”);
- Competences catalogue;
- Set of competence tests („Competences tests”);
- Institutions catalogue;
- Experts catalogue;
- Glossary of terms;
- Contact information („Contact”).

The verification process took place according to the following schedule:

- verification of linguistic correctness;
- verification of compliance of units of learning outcomes included in the database with assumptions;
- verification of functioning of competence tests for occupations and qualifications included in the project;
- verification of data on cooperating institutions included in the database;
- verification of contact information correctness;

The testing process was carried out on the basis of data resources, that included qualifications in professions "Child Care Worker" and "Health Care Assistant". Persons involved in the testing process, depending on their rights, were performing tasks required to operate the designed system. Various actions were carried out in online mode under control of system administrator. Linguistic correctness of data entered has been also checked, in order to detect any mistakes that might appear at the stage of entering. Each partner has tested the ICT tool in accordance with established assumptions. In total, the partners have tested established in the project the number of people.

As a result of the work collected feedback from the project partners that contained a list of recognized problems and range of recommended modifications concerning user interface and functionality of the system. The pilot took, part 84 people.

The list of collected remarks is shown below:

- *"In my opinion the project is very important to both the client and the workers. It makes the work safe and easy";*
- *"Written guideline for the questioner was not very well instructed, it raise many questions in the students minds. Some the questions in the same forms are written twice. Forms are not seems to be very understandable or logical in that way, (almost everybody thinks that he or she is competent in all fields mentioned in the forms). I did not really catch the idea behind the questioner";*
- *"It is very important to always put all the skills one has when dealing with support and guidance of growth and getting along with the co-workers for better results. And for the well-being of the clients or patients in different aspects. It helped me to know my weakness and strength";*
- *"The linguistic correctness is excellent. The questions are very clear and addresses the correct points. The aim of the questionnaire is very confusing & not really useful for us who are not in the field (but might be useful for people who are already in the field)";*
- *"In my opinion I think there is always a need to use proper materials for learning basis, but I don't recommend early childhood using technology for kids. Instead make kids to hear through radio or television instead of laptop and computers or mobile. Always be attentive in early childhood development. These are places I should improve for myself to be better in job-learning";*
- *"In my own opinion I think this tool is good and it will be of help in the future but I think the only disadvantages it will have is the language barrier";*
- *"I think it would not be advisable for students to take responsibility of his or her learning and assess own vocational development there must be some to be of guide";*
- *"It makes us confused. But it's a good idea to improve our skills and an opportunities to learn more in a different way. I found this particular project very interesting. It aims to harmonize common working methods and evaluation within the European Union. Competence and reliable tools in working in the care sector. It also provides a platform for the member countries to share a common educational curriculum in the studies of child care issues that meets the required standards set by the European Union. I think it also makes it easier for citizens of member countries to easily work comfortably in each country";*
- *"Well, I will comment on the falling areas, firstly the level of understanding of the test was good. The exercise is in great details about the competence of need for the profession to have a common curricula. This would further strengthen the European educational system";*
- *"The questions are well constructed and easy to understand. They are to the point and evaluate individual learning and skills. However the questionnaire does not seem to consider the fact that answers are collected from a wide range of workers with varying age, education background and work experiences. Perhaps it would also be*

good to include in a part as to what kind of formal education and what sort of work the worker has done in the past so as to relate to the answers produced”;

- *“In my opinion the questionnaire will only evaluate labour competencies in the region but not evaluate how learning and how much of experiences or lack of experiences has made the competencies different in different workers”;*
- *“It’s about knowing the competency of our individual skills, ethics, and values in child care related works. It’s also based on improving the assessments of the qualities of childcare workers in mentioned countries. The questionnaire basically trying to know my level in care giving situation with my clients”;*
- *“The questionnaire is too long to be completed. The questionnaire is boring! The questionnaire is meant for those already in the field or retired persons and has less focus on students. As a suggestion you can make it more interesting and a learning tool by including learning materials and personal test for students other than being just a questionnaire seeking answers only like a traffic police”;*
- *“I consider that test came a little earlier thus it didn’t cover our full developed potential. There are a lot of responsibilities and tasks that we can’t performed at this level of our education. I believe that this test would be more suitable for second year students. I have no remarks regarding test’s linguistic correctness or clarity. I enjoy working this test due to the fact that now I have a basic idea what are going to be my duties in a future. Greetings for Poland and Spain”;*
- *“Children needs all the love and care from parent and teachers to grow into a good adult. Generally I feel it a good self-evaluation tool. It is help one to reflect on the student’s abilities. It is also helpful in that the student is given an opportunity to clearly see where he or she needs to improve. The question were well praise and to the point covering all area of competences”;*
- *“The test has been very useful. Through this test I could know various parameters which are important for a child care worker to work on. It gave me an idea on the areas I have to improve on to be a competent and a qualified child care worker. These kind of tests should be there to improve the child and healthcare system”;*
- *“In my own opinion the competence test is generalized enough to cover all the competencies/qualifications needed for supporting the growth and development of a child. It embodies work ethics, values, aims and knowledge beyond the basic needs of the client”;*
- *“I think almost everything in the question was equally important for it will always depend on the situation at hand and thus need for being flexible and creative. Most importantly is to do accordingly to the law and take into consideration, children’s safety”;*
- *“The competency test was an eye opener in that personal evaluation was good and also a good tool in better understanding on personal development skills such as listening skills, team skills, observation skills. Test also enabled new learning and new challenges”;*
- *“As for me, all the questions on that test are quite good. They are all related on how we are going to interact and act with the clients. It actually helps me think about how important our clients should be in our life”;*

- *“The competency test was far too long and the sentences at times difficult to understand. I would have needed better instructions on how to do the assessment”;*
- *“The layout of the pages is pretty. I was able to understand all the words and concepts, although it was a little confusing to find the right competency test links at first. You should have a good basic knowledge of practical nurse education before you could do the assessment. That’s why I can’t recommend it to those who don’t know anything about the field of practical nursing”;*
- *“I wondered why this should be done? How can it help me/what motivates me in doing the competency test? I would have needed more instructions on page”;*

Collected at this stage of tests results were the basis for introduction of changes in the information system in the field of:

- modification of descriptions that explain the tests and the results of competence tests,
- functions of administrator, operator and participant,
- functionality of the system on monitoring (updates) and evaluation of competences.

After making necessary changes mentioned above, the application was again made available on a Web server in ITeE - PIB at: <http://trans-finecvet.eu/service/en/>.

## **5. Development the recommendations in the scope of programme offer for nonformal education in the profession: Child Care Workers and Health Care Assistants**

It is recommended to introduce also the descriptions of qualifications to formal and non-formal education practice. The developed base, together with the ICT tool may contribute to the improvement of the quality of education and, undoubtedly, facilitate the learning process and checking the competences of the students. The base for the descriptions of the qualifications may be utilized as a certain type of standard for development of the similar base for other qualifications/competences and professions. It may be also employed in development of curricula in non-formal education.

The mentioned base will be useful for the persons who intend to undertake education in the described professions in order to check their so-far possessed competences.

## **6. Conclusions**

The design and implementation work focused on development of the information system that represents an innovative tool to support management and development of human resources in two professions "Child Care Worker" and "Health Care Assistant". In particular the ICT tool provides support processes of creation, update and evaluation of qualification descriptions and units of learning outcomes in terms of adjusting educational offer to labour market needs and requirements of the ECVET system. It should be noted that in the market of educational services there is no such solutions, which on the one hand constitute a



knowledge base of required by employers learning outcomes in selected professions, on the other hand give opportunity to interact with actual competencies of students, graduates and candidates for employment or employees that operate in the labour market. This is particularly important for knowledge management in enterprises, including planning and development of vocational training programs for staff.

Performed the verification tests made it possible to improve the ICT tool designed to meet the needs of potential users. Thanks to this it is possible to carry out wide implementation of the ICT tool to the practice of formal and non-formal education.

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