

Proposal of a Methodology For Non-Formal Competences Certification

Domenico Falcone, Alessandro Silvestri, Cristina Cerbaso, Antonio Forcina, Gianpaolo Di Bona

Department of Civil and Mechanical Engineering,
University of Cassino and Southern Lazio,

Italy

silvestr@unicas.it

ABSTRACT

The work aims to present a methodology for certifying the competences acquired in non-formal contexts.

Given the absence of a framework to respect, but following the criteria established by the “Council Recommendation of 20th December 2012 on the validation of non-formal and informal learning” (2012/C 398/01), a model, called “ABC - Competence: Analysis, Balance and Certification of Competences”, has been developed. After the professional profile identification (i.e.: ESCO - European Skills/Competences, qualifications and Occupations classification), the model allows certifying the competence level acquired by the learner as a result of participation in a training course.

In the model definition it is significant:

- the identification of the trainer figure; he becomes the guarantor of contents and training methodologies choice and evaluates the actual acquisition of competences by the learner;
- the classification of competences (*knowledge/ability; hard/soft*);
- the identification of competence level, according to the European Qualifications Framework for lifelong learning.

Keywords: competence, non-formal, certification, balance

INTRODUCTION

The **model for non-formal competence certification** permits to evaluate and certify the competences acquired by learners of a vocational training course (CEDEFOP, 2009b).

Non-formal learning is different from formal learning because it takes place outside the formal school/vocational training/university system, through planned activities (e.g. with goals and timelines) involving some form of learning support, for example:

- programmes to impart work-skills, literacy and other basic skills for early school-leavers;
- in-company training;
- structured online learning;
- courses organised by civil society organisations for their members, their target group or the general public.

Instead, informal learning is not organised or structured in terms of goals, time or instruction. This covers skills acquired (sometimes unintentionally) through life and work experience, for example:

- project-management or IT skills acquired at work,
- languages and intercultural skills acquired during a stay abroad,
- IT skills acquired outside work,
- skills acquired through volunteering, cultural activities, sports, youth work and through activities at home (e.g. taking care of a child).

To develop a model for competence certification, you need to have a reference framework (Robinson, 2007), currently not yet defined, but it's possible to follow the criteria dictated by the "Council Recommendation of 20th December 2012 on the validation of non-formal and informal learning" (2012/C 398/01) (European Parliament; Council of the European Union; 2007; European Parliament; Council of the European Union; 2008; Council of The European Union, 2012)

The model for non-formal competence certification is applicable to different types of competence, both manual/operational/craft and organizational/managerial/intellectual.

In general, it is possible to differentiate between **Hard and Soft skills** (ISFOL, 2013).

Soft skills are personal attributes that enhance an individual's interactions, job performance and career prospects. Unlike hard skills, which are the technical requirements of a job and many other activities, soft skills relate to a person's ability to interact effectively with co-workers and customers and are broadly applicable both in and outside the workplace (*Spencer&Spencer* and *Goleman Emotional Intelligence* models).

Competence certification must enable you to recognize and evaluate the acquisition in an individual of theoretical knowledge and practical skills, both highly technical and related to a specific work context, and transversal and useful in different working contexts.

Competence certification allows obtaining a whole profile certification or part of it (Franceschetti, 2012).

A partial classification of profiles and skills is already used in the European job mobility portal EURES and PLOTEUS (EURES, 2013; PLOTEUS, 2013). It exists in many languages and currently contains thousands of skill descriptions and job titles. It will be updated and enriched with additional descriptions of occupations, skills/competences and qualifications to become an important part of ESCO (European Skills/Competences, qualifications and Occupations classification) (ESCO, 2011).

The professional profile definition also helps deepen understanding of labour market needs and connecting education/training outcomes with jobs (Westerhuis, 2011).

Competence Certification Process

Systematic validation mechanisms is an enhancement tool for the individual making clear which skills are available in the European workforce (UNIONCAMERE, 2013):

- facilitating a better match between skills and labour demand, addressing skills shortages in growing sectors;
- promoting better transferability of skills between companies and sectors;
- helping citizens move around the EU to study and work.

As previously mentioned, the competence is a structured set of knowledge (to know) and skills (to know how) to be used independently in work or study situations and in professional and personal development. Therefore, certify a professional profile (set of competences) means attest knowledge, skills or "*the ability to use knowledge and skills independently in real-life contexts*" (competence), depending on the profile characteristics.

Conceptually, a person could be skilful but not competent, in the sense of lacking the necessary theoretical knowledge in a particular field.

Wanting to restrict the certification of skills in non-formal learning contexts, the model for competence certification will aim the investigation, according to the specific course characteristics, of:

- theoretical concepts acquisition (*knowledge certification*);
- practical ability acquisition (*skills certification*);
- the joint acquisition of theoretical concepts and practical abilities, knowing how to use independently in work situations (*competence certification*).

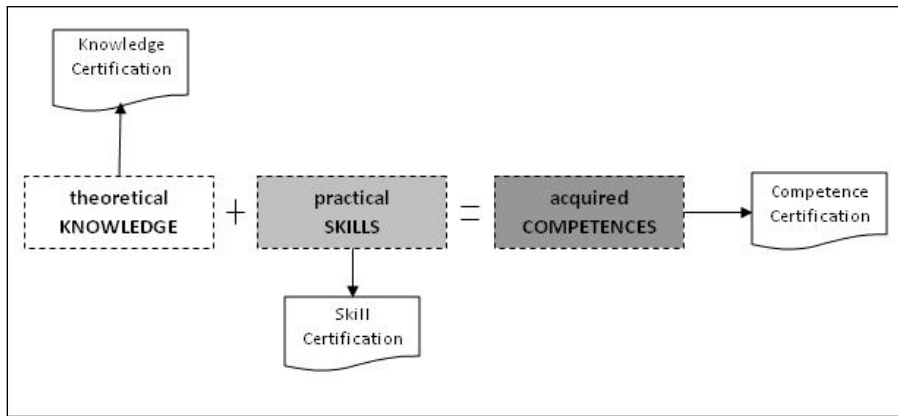


Fig. 1 – Certification process

“ABC-Competence” Model: Analysis/Balance/Certification of Knowledge/Skills/Competence

The proposed model, called ABC-Competence (Analysis/Balance/Certification of Competences) provides three possible investigations:

1. Certification of acquired competences:

Assessment of matching between the proven competences and the reference standard.

2. Balance of competences, input and output:

Assessment of the competence level growth as a result of participation in the course.

3. Training requirements, satisfied and to satisfy:

Evaluation of learners expectations and their satisfaction.

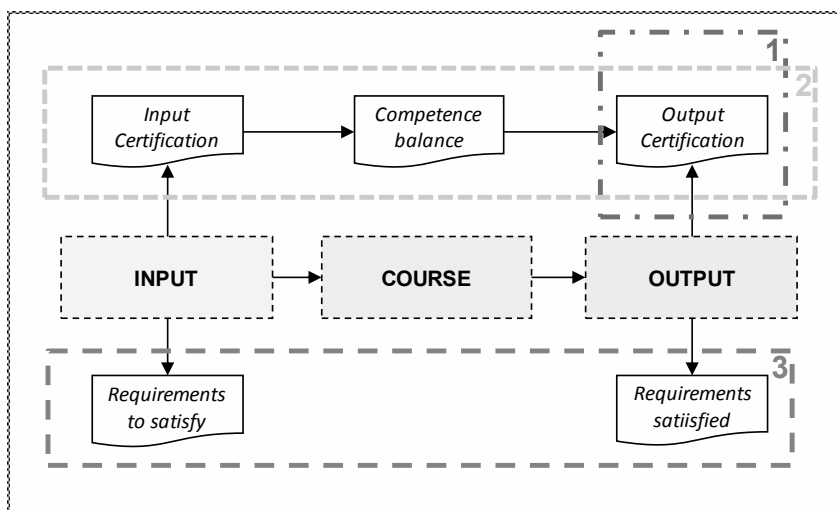


Fig. 2 – Certification model scheme

1. Certification of competence

The assessment of a candidate competences is based on the comparison between the proven skills and a reference standard.

If a conformity between the assessed competences and the reference exists, the certification process is successful and the learner can obtain a certificate of competence with evaluating the possessed level.

Therefore, the major difficulty for the competence certification is the definition of competence indicators (an element or a set of elements, able to report or provide information about property of a particular competence).

The set of indicators attributed to a competence defines distinctive and ascertainable criteria that make clear the competence acquisition, in reference to the application context.

On the basis of the Council Recommendation of 20th December 2012, cited above, each certification process takes place through the following four steps:

- **Identification:** phase aims to identify and define the competences amenable to a certifiable standard;
- **Documentation:** phase of evidence gathering and/or testing, aimed to document the competence possession
- **Evaluation:** phase of verification of competence possession (according to criteria and indicators referring to predefined standards) and assessment of the achieved level;
- **Certification:** phase which concludes the certification process. It consists in releasing standardized documents that certify the competences assessed, according to defined rules.

The following flowchart (Fig. 3) shows the activities to be performed within the different phases and related responsibilities.

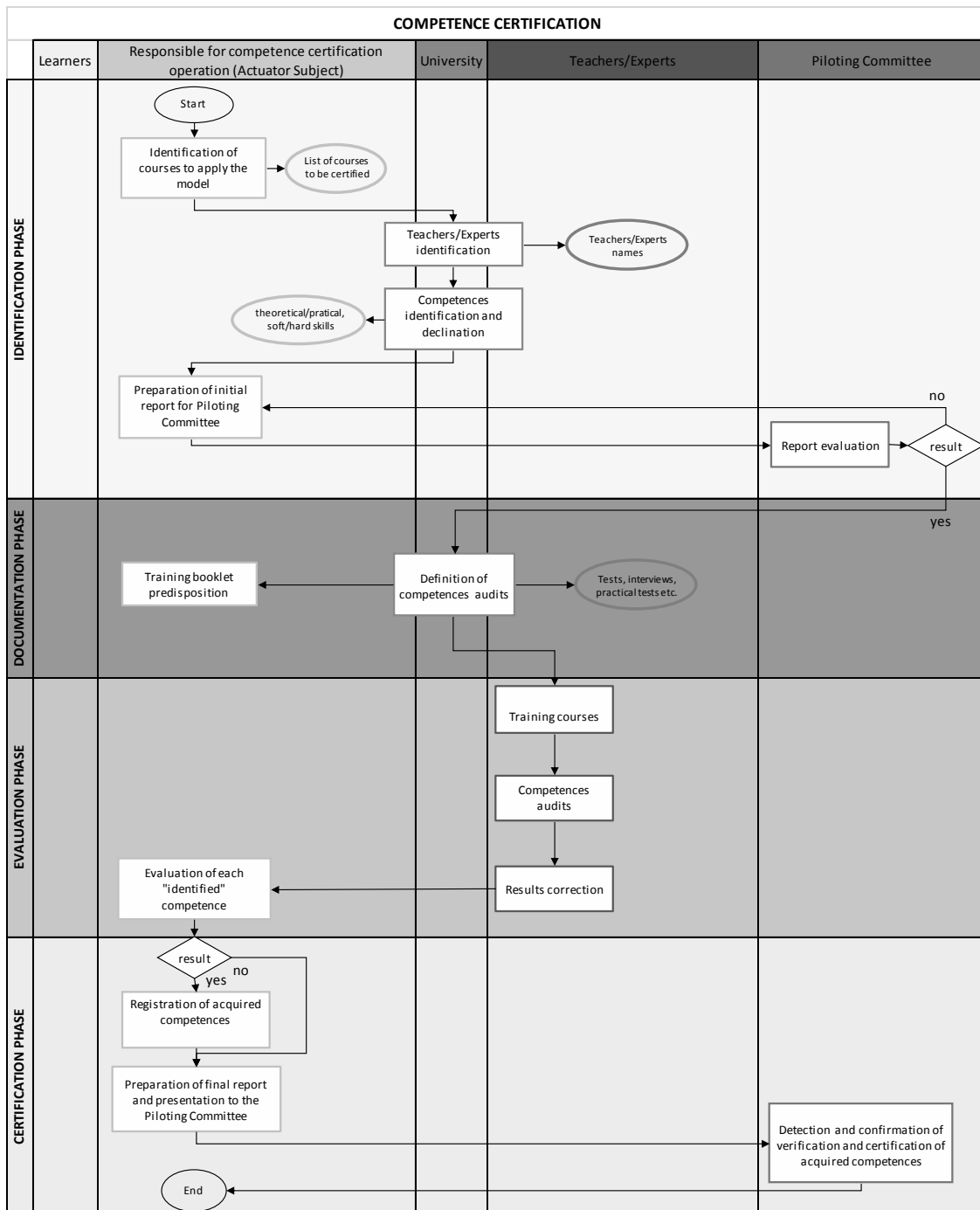


Fig. 3 - Flowchart of skills certification (phases-activities-responsibilities)

Given the absence of a framework to evaluate the acquired competences, it becomes essential entrusting the non-formal education and, consequently, its effectiveness evaluation, to experienced trainers in the professional profile that you intend to form.

Furthermore, only “an authorised body confirms that an individual has acquired learning outcomes (knowledge, skills and competences) measured against a relevant standard” (*Council Recommendation of 20th December 2012 on the validation of non-formal and informal learning*) (UNESCO, 2011).

Therefore, the qualified teacher becomes the guarantor of contents and training methodologies and evaluates the actual acquisition of competences by the learner (Dreyfus et al., 1980).

The trainer qualification (as in other areas, such as Health and Safety at Work) is based on his documented and provable previous experience.

To qualify the teaching staff, you can refer to the guidelines for the European Social Fund 2007-2013 reporting, which identify three levels of teaching:

Group A: requires at least ten years of experience and includes university professors, senior researchers (research managers, early researchers), business executives, entrepreneurs, industry experts and professionals;

Group B: requires a minimum of three years of experience and includes university researchers, industry experts and professionals;

Group C: includes university researchers, industry experts and professionals with less than three years of experience.

The University will ensure that trainers have the necessary technical and professional requirements (Teachers of Group A, B or C).

The presence of such expert figures will produce a training course adequate to the profile to be formed and, consequently, will certify the acquisition of specific skills, whether theoretical/practical (*knowledge/ability*), technical/transversal (*hard/soft skills*).

In order to base the competence assessment on correct and reliable data, expert trainers, supported by the University, will adopt an audit (questionnaire, test, interview, practice test etc.), opportunely defined.

For example, if the chosen tool is the questionnaire, a question with three answers (only one correct), for every two hours of training, will be prepared by the teacher, who will have also to provide information about the question characteristics:

- **Valence: theoretical / practical** (assessment of knowledge or ability, respectively);

- **Nature: transversal / technical** (assessment of soft or hard skills, respectively).

The criteria to be satisfied in order to demonstrate the competence, will be implicitly defined by the definition of the questions. Obviously, they are inextricably linked to the course content.

In particular, soft skills are generally grouped into four main macro-categories (Personal, Relational, Cognitive and Organizational), instead, technical ones will be identified according to the professional profile considered.

The question structure could be as follows:

Scheme of question

	QUESTION:	VALENCE:	NATURE:
1 question with 3 answers (only one correct), per every 2 hours of training	<ul style="list-style-type: none"> ○ Answer 1 ○ Answer 2 ○ Answer 3 	<ul style="list-style-type: none"> <input type="checkbox"/> Theoretical (<i>knowledge</i>) <input type="checkbox"/> Practical (<i>ability</i>) 	<ul style="list-style-type: none"> <input type="checkbox"/> Transversal (<i>soft skills</i>)* <input type="checkbox"/> Technical (<i>hard skills</i>)**

Choose the investigated COMPETENCE:

*

PERSONAL: awareness of strengths and weaknesses, target orientation, manage their own emotions and behaviors, stress management.

RELATIONAL: listening skills, social skills and empathy, communication skills, persuasiveness and influencing skills;

COGNITIVE: analysis and synthesis skills, problem solving, logical and / or mathematical reasoning, creativity;

ORGANIZATIONAL: planning skills, time management, control ability, flexibility.

**

TECHNICAL/PROFESSIONAL SKILL (PROFILE) _____

Example of question for the assessment of a transversal knowledge:

1 question with 3 answers (only one correct), per every 2 hours of training	QUESTION:	VALENCE:	NATURE:
	What is 2+2?	X Theoretical (knowledge)	X Transversal (soft skills)*
	<input type="radio"/> 3	<input type="checkbox"/> Practical (ability)	<input type="checkbox"/> Technical (hard skills)**
	<input type="radio"/> 4		
	<input type="radio"/> 5		

X * COGNITIVE: logical and / or mathematical reasoning

Example of question for the assessment of a transversal ability:

1 question with 3 answers (only one correct), per every 2 hours of training	QUESTION:	VALENCE:	NATURE:
	If two children have two sandwiches each, how many sandwiches together?	<input type="checkbox"/> Theoretical (knowledge)	X Transversal (soft skills)*
	<input type="radio"/> 3	X Practical (ability)	<input type="checkbox"/> Technical (hard skills)**
	<input type="radio"/> 4		
	<input type="radio"/> 5		

X * COGNITIVE: logical and / or mathematical reasoning

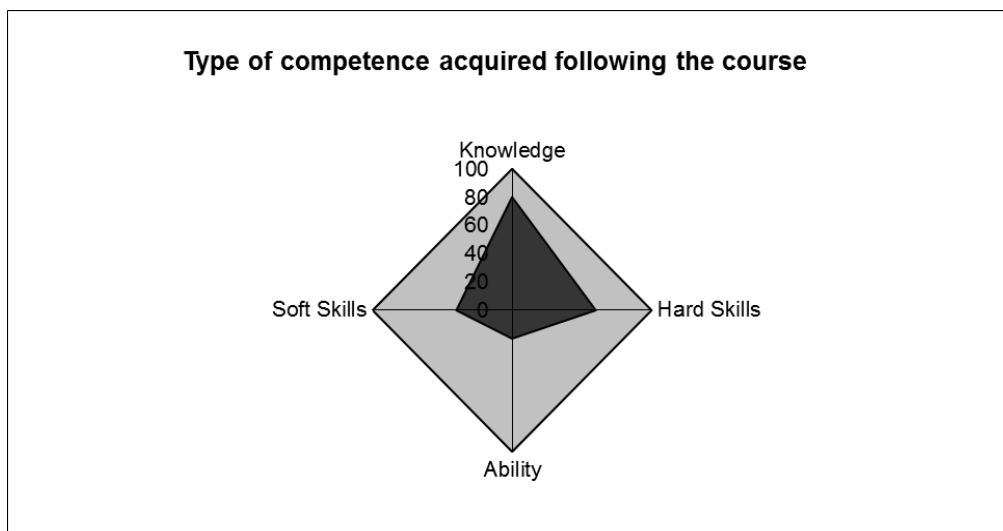
The choice of the questions allows defining the region of competence investigated, valence (knowledge / ability) and nature (soft / hard skills); then, by analyzing the answers given by each learner, it will be possible to value his level of possession.

For the choice of the possession levels, we referred to the descriptors of the *European Qualifications Framework* for lifelong learning (EQF) (European Commission, 2008a; European Commission, 2008b). According to this framework, we can establish 8 levels, related to the learning outcomes and to the possession of knowledge, skills and competences. The rating scale suggests the levels and ratings listed below:

- **Excellent (score 9-10):**
critical and in-depth knowledge of the topics, commendable competence level.
- **Outstanding (score 8-9):**
extensive knowledge of the topics, very good competence level.
- **Good (score 7-8):**
satisfactory knowledge of the topics, discrete / good competence level.
- **Average (score 6-7):**
essential knowledge of the topics, just enough competence level.
- **Mediocre (score 5-6):**
fragmentary knowledge of the topics, modest competence level.
- **Insufficient (score 3-4):**
incomplete knowledge of the topics, level of competence not sufficient.
- **Poor (score 2-3):**
very sketchy knowledge of the topics, grossly inadequate competence level.
- **Null (score 0-2):**
no knowledge of the subjects, competence level very low or nil.

In line with the European Qualifications Framework (EQF), all Member States are in the process of developing National Qualification Frameworks (NQFs), which describe qualifications in terms of learning outcomes (CEDEFOP, 2013a; ISTAT, 2009; Coles, 2007).

The distribution of questions among the different types of skills investigated, can be summarized through a Radar graph, which allows us to delineate the region of the skills acquired thanks to the course (Fig. 4).

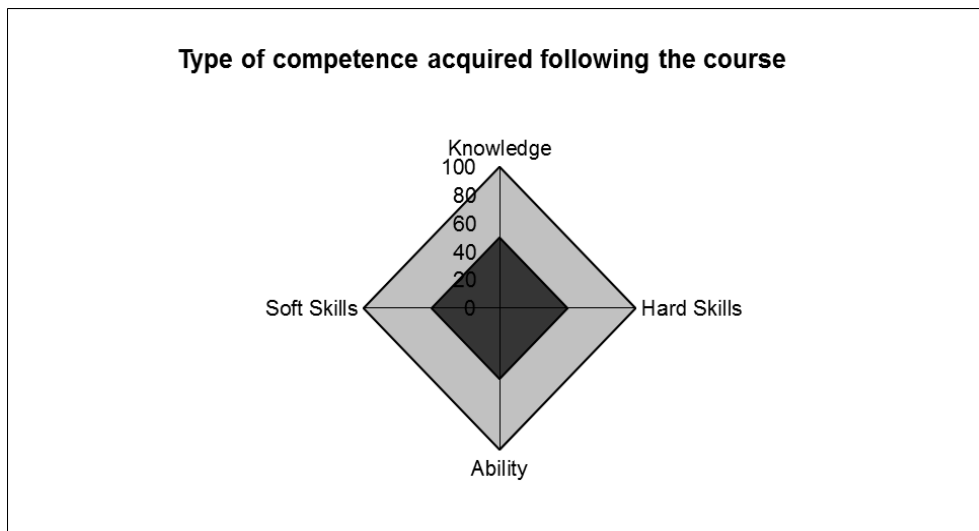


Question type	% total	% questions
Knowledge	100%	80%
Ability		20%
Hard Skills	100%	60%
Soft Skills		40%

Fig. 4 – Definition of the region of competence investigated

The darker polygon indicates how many questions compared to the total (clearer polygon), refer to knowledge rather than ability or hard skills rather than soft skills.

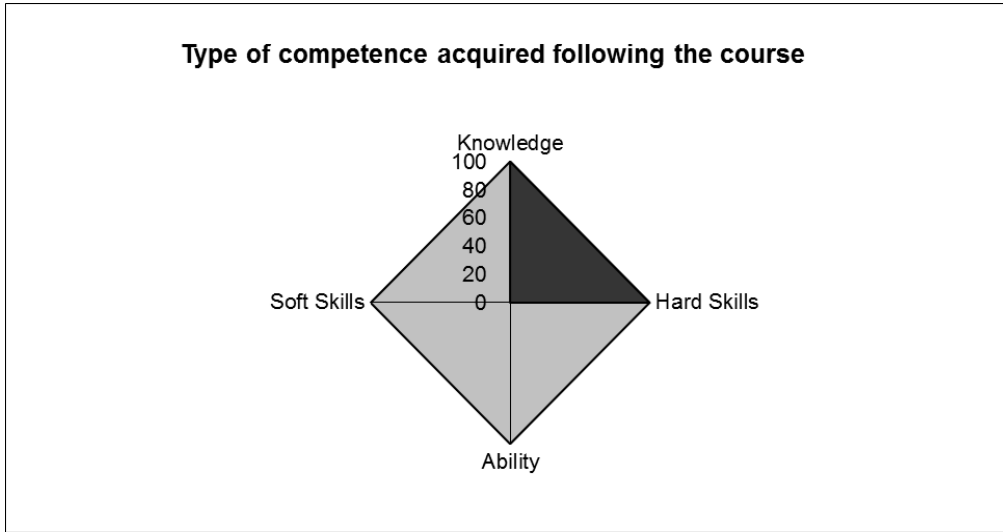
For example, in the case of questions half and half theoretical and practical, rather than half and half transversal and technical, the radar graph will be as follows (Fig. 5).



Question type	% total	% questions
Knowledge	100%	50%
Ability		50%
Hard Skills	100%	50%
Soft Skills		50%

Fig. 5 – Example of Representation 50-50, theoretical-practical and transversal-technical

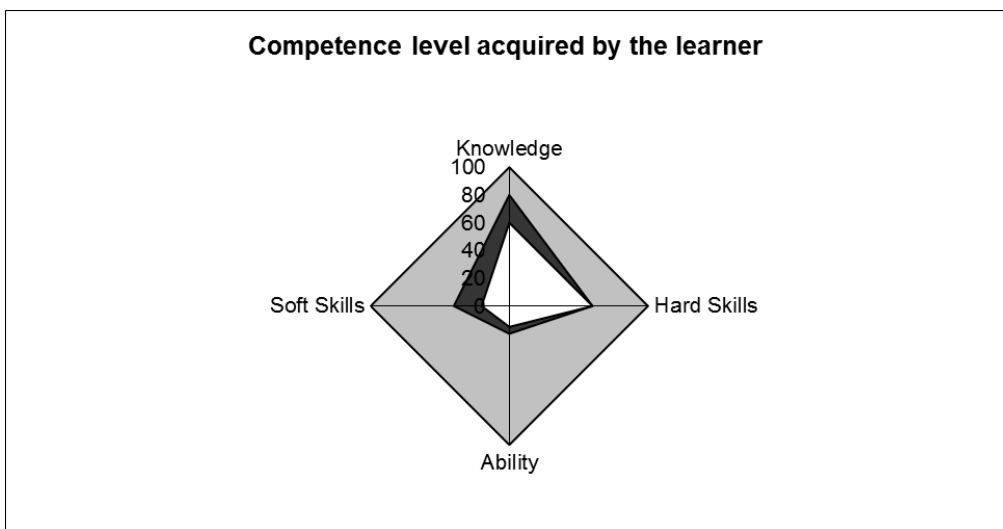
Instead, in the case of questions only theoretical and technical, we have the following representation:



<i>Question type</i>	<i>total</i>	<i>%</i>	<i>% questions</i>
Knowledge	00%	1 %	100
Ability			0%
Hard Skills	00%	1 %	100
Soft Skills			0%

Fig. 6 – Example of representation only theoretical and practical questions

In the same way, it is possible to represent the level of skill possessed / acquired by each learner (Fig. 7).



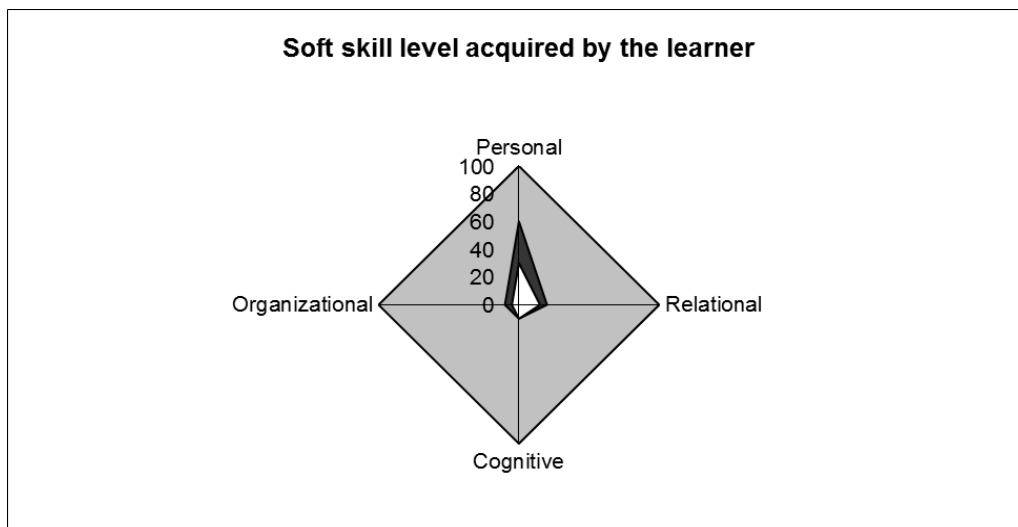
Question type	% total	% questions	gained level
Knowledge	100%	80%	6
Skills		20%	6
Hard Skills	100%	60%	8
Soft Skills		40%	4

Fig. 7 – Representation of the level of skill possessed / acquired by the learner

The innermost polygon (white color) indicates the level of skills possessed / acquired by the learner, referring to the competence region of the course (darker polygon), calculated on the basis of the correct answers for the different types of investigated skills. If all answers are correct, the white polygon overlaps the darker one.

Obviously, thanks to the information about the question type, provided by the teachers, it is possible to make a more detailed assessment and proceed to the **certification of specific skills**, to be included in the certificate which will be issued to the learner.

You can, for example, evaluate and represent which types of soft skills are investigated and owned by the learner (Fig. 8).



Soft Skill type	% total	% questions	gained level
Personal	100%	60%	4
Relational		20%	6
Cognitive		10%	6
Organizational		10%	8

Fig. 8 – Representation of the soft skill level possessed /acquired by the learner

The same analysis can be done for technical skills, related to the particular professional course.

In fact, the type (valence and nature) of questions to be asked, can either be chosen by the teacher both defined in the design phase to force the contents towards the development of specific skills.

2. Balance of input and output competences

A further aspect of the assessment could investigate the growth concerning learner knowledge/skills/competence level, as a result of attending a specific course.

For this purpose, the questionnaire introduced in the previous paragraph should be made before starting the course and administered in both at the beginning and at the end.

By the collected results, the effectiveness of the training in competences increase and, consequently, the value of the trained person will be monitored.

The possibility of evaluating the competence increasing, will obviously depend on the specific course duration.

In the case of short courses, less than 40 hours, it's expected a single check at the end of the training.

In the case of long courses, exceeding 40 hours, it will be possible to evaluate the growth, for example, through the administration of two questionnaires, at the beginning and at end of the course, achieving an "in and out" competence balance.

The questions will be similar for both tests, so you can really evaluate the effectiveness of training activities. It will be changed the order and wording of the questions and some will be even redundant, so you can verify the effective knowledge of the answer by the learner.

3. Competence analysis

In order to analyse the most important training deficiencies perceived by the learner, will be necessary to provide questions, aimed at understanding the training needs satisfied and those to be met.

- Ex ante: the learner in self-assessment can determine how much he expects that the course is relevant to his studies or how much he believes it useful for his career;
- Ex post: the learner, still in self-assessment, can determine how much the course has corresponded to his expectations and how will be (if measured immediately after the course) or was (if assessed after time from the end of the course) useful to his work.

Competence Certification Module

The certification process must be completed with the declaration of competences possessed by the learner, also according to the principles of transparency and comparability promoted by the European Union (CEDEFOP, 2005; CEDEFOP, 2009a; CEDEFOP, 2013b; CEDEFOP, 2013c).

The proposed certification module will be similar to the one established by the Italian Ministry of University and Research for the certification of basic competences in the major cultural areas (Language, Mathematics, Science-Technology, History-Social).

The certificate will list the competences acquired by the learner, in terms of knowledge and skills, divided into technical and transversal ones.

In order to monitor the professional growth of the learner, will be set up a training booklet, containing information about all the courses attended and the achieved results, including details of tested and certified competences.

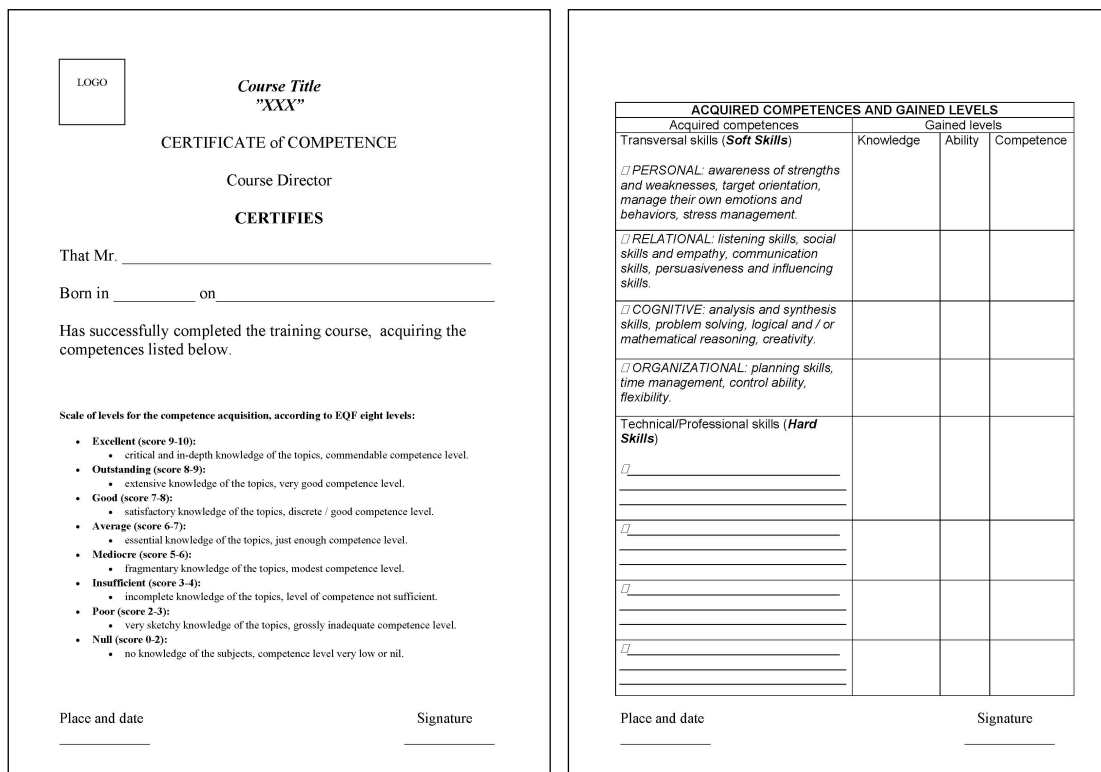


Fig. 9 – Fac-simile of Certificate for Training Booklet

RESULTS AND FUTURE DEVELOPMENTS

The simplicity of the proposed methodology ensures easy application in different educational contexts. In particular, its implementation is taking place in some training courses carried out by Confindustria Perform Srl, part of Fondimpresa 2012.

The expected results will then be analysed in order to understand potentialities and limitations of the ABC-Competence model.

The generality of the methodology allows adapting it to the current evolution of the European regulatory framework.

CONCLUSIONS

In the present work a methodology for certification of competences acquired in non-formal contexts is proposed, in a framework constantly evolving.

The "ABC-Competence" model, after identifying professional profile (set of competences) to be investigated, permits to certify the level of competence achieved thanks to the participation in a training course.

Three different certifications of acquired competences are proposed, depending on the survey you want to lead (Analysis / Balance / Certification); a possible certification module, based on the EQF levels has been also presented.

The development of specific competences (theoretical and practical, rather than transversal and technical), can be followed through the creation of a special training booklet, which the learner must take care to update.

REFERENCES

CEDEFOP (2005) - [European Centre for the Development of Vocational Training. European reference levels for education and training: promoting credit transfer and mutual trust.](#)

http://www.cedefop.europa.eu/en/Files/5146_EN.PDF [accessed 17.11.2013].

CEDEFOP (2009a) - [European Centre for the Development of Vocational Training. The shift to learning outcomes: policies and practices in Europe.](#)

<http://www.cedefop.europa.eu/EN/publications/12900.aspx> [accessed 18.11.2012].

CEDEFOP (2009b) - [European Centre for the Development of Vocational Training](#). *European guidelines for validating non-formal and informal learning*.

<http://www.cedefop.europa.eu/EN/publications/12900.aspx> [accessed 18.11.2012].

CEDEFOP (2013a) - [European Centre for the Development of Vocational Training](#). *Analysis and Overview of NQF level descriptors in European countries*.

http://www.cedefop.europa.eu/EN/Files/6119_en.pdf [accessed 17.11.2013].

CEDEFOP (2013b) - [European Centre for the Development of Vocational Training](#). *Roads to recovery: three skill and labour market scenarios for 2025*.

<http://www.cedefop.europa.eu/EN/publications/21513.aspx> [accessed 17.11.2013].

CEDEFOP (2013c) - [European Centre for the Development of Vocational Training](#). *Quantifying skill needs in Europe Occupational skills profiles: methodology and application*.

http://www.cedefop.europa.eu/EN/Files/5530_en.pdf [accessed 18.11.2013].

Coles, M. (2007). *Qualification frameworks in Europe: platforms for collaboration, integration and reform*. Conference: Making the European learning area a reality. Munich. 3-5 June 2007.

Council of The European Union (2012) - *Recommendation of 20 December 2012 on Validation of non-formal and informal learning (2012/C 398/01)* - Official Journal of the European Union 22.12.2012.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2012:398:0001:0005:EN:PDF> [accessed 10.11.2013].

[Dreyfus, Stuart E.; Dreyfus, Hubert L.](#) (February, 1980). *A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition*. Washington, DC: Storming Media. 13th of June, 2010.

ESCO (2011) - European Skills/Competences, qualifications and Occupations. *The vision behind ESCO*. <http://ec.europa.eu/social/main.jsp?catId=1042&langId=en> [accessed 12.11.2013].

[EURES \(2013\) - The European Job Mobility Portal](#). <https://ec.europa.eu/eures/> [accessed 27.11.2013].

European Commission (2008a). *The European qualifications framework for lifelong learning (EQF)*.

http://ec.europa.eu/education/policies/educ/eqf/eqf08_en.pdf [accessed 20.11.2013].

European Commission (2008b). *NACE Rev. 2.: statistical classification of economic activities in the European Community*. Eurostat methodologies and working papers.

http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF [accessed 20.11.2013].

European Parliament; Council of the European Union (2007). *Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning*. Official Journal of the European Union, L 394, 30.12.2006, pp. 10-18.

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:EN:PDF> [accessed 20.11.2013].

European Parliament; Council of the European Union (2008). *Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European qualifications framework for lifelong learning*. Official Journal of the European Union, C 111, 6.5.2008, pp. 1-7.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:111:0001:0007:EN:PDF> [accessed 20.11.2013].

Franceschetti, M. (2012). *Indagine campionaria sulle professioni: Isfol-Istat: seconda edizione [Sample survey of occupations: Isfol-Istat: second edition]*. Roma: Isfol.

ISFOL (2013) - Italian Ministry of Labour and Social Affairs. *Transversal skills: Survey on occupations*. <http://professionioccupazione.isfol.it/> [accessed 12.11.2013].

ISTAT (2009). *L'indagine sulle professioni, anno 2007: contenuti, metodologia e organizzazione [Survey of occupations 2007: contents, methodology and organisation]*. Rome: ISTAT – Istituto Nazionale di Statistica. Metodi e Norme; 42.

http://www.istat.it/it/files/2011/03/mn0942_indagine_sulle_professioni_20071.pdf [accessed 30.10.2013].

PLOTEUS (2013) - Portal on Learning Opportunities throughout the European Space.

<http://ec.europa.eu/ploteus> [accessed 27.11.2013].

Robinson, M. A., Sparrow, P. R., Clegg, C., & Birdi, K. (2007). *Forecasting future competency requirements: A three-phase methodology*. *Personnel Review*, 36(1), 65–90.

UNESCO (2011) - *Final Report, International Conference of States to Examine and Adopt Amendments to the 1983 Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and the Pacific*. Tokyo, 25-26 November 2011.

UNIONCAMERE (2013) - *Employer surveys: Excelsior system for employment and skills needs*.

<http://excelsior.unioncamere.net> [accessed 12.11.2013].

Westerhuis, A. (2011). *The meaning of competence*. In: Brockman, M. et al. (eds). *Knowledge, skills and competence in the European labour market: what's in a vocational qualification?* Abingdon: Routledge, pp. 68-84.