FROM WORK TO TRAINING. CASE STUDY ON THE DESIGN OF A TRAINING STANDARD

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Abstract: *The approach of training based on competence has gained popularity as an alternative to the behaviourist approach, based on objectives and much closer to the taylorist conception on work. During the last decades, standards of professional activities have been designed using competences. These are competence, training and certification standards which highlight the relation between work and training and allow the personalisation of training and the mobility of workers. This article is to describe a training standard. Due to the fact that this instrument is not yet used in Romania, we present a mini-case study for the occupation of manufacturer-assembler of textile fabrics.*

Key words: *Competence, training standard, manufacturer assembler of textile fabrics.*

1. Introduction

In the last two decades of the former century, the educational approach based on competences has gained popularity as an alternative to the old behaviourist approach [8], [10].

In the numerous published papers, the definitions of 'competence', although similar, are not identical. They describe the types of situations which have to be mastered in order to obtain the expected results, considering the rules and limitations under the circumstances of the existence of some cognitive resources [20] or the possibility to act by combining 'savoir agir' (knowing how to act), vouloir agir (wanting to act), pouvoir agir (being able to act) [14].

Competences are potential resources used to manufacture a product or to complete a task, in a given organisational context, using the means provided by the company [22], [24]. The following are almost unanimously acknowledged as components of competence (i) knowledge (ii) abilities and (iii) attitudes, values or personal traits [24]. In the attitudes category, the responsibility and autonomy of the worker play a special part [28]. The two features make the difference between the mediocre worker and the excellent one, and were named 'competency' by some authors, in order to be differentiated from the superordinate and integrative term 'competence' [5], [25]. According to some opinions, 'competence' refers to the global mastery of a situation, but it remains unobserved, as in a 'black box', characterised as a 'strange attractor' [13], [12]. The competences defined as such have begun to be used in order to describe

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a job or a professional training, being thus integrated in the professional standard and in the competence standard [18].

The standard (in French *référenciel*), an instrument largely used in the Francophone countries, is a descriptive and normative document [7], situated between the real work, the prescribed work and the idealised work [15]. The standard gradually becomes the key element of the curricular architecture, of the planning and assessment in education and training [20]. The introduction of the standard has led to the substitution of the logic of pedagogy based on objectives, which was predominant in the first half of the 20th century, which was a product of behaviourist psychology and similar in approach to the taylorist conception on work [18].

The professional activity standard is the document which describes, based on work analysis, the activity conducted by an operator, in a given context. It associates the knowledge (K), skills (S) and attitudes, values and personality traits (A) to the professional activities and tasks. The standard was designed with the contribution of experts in a certain occupational field and of experts in work and organisational psychology. Based on the professional standard and using the didactic transposition, the competence standard, the red wire of Human Resources management, is designed [10], [21].

The training standard results from the competence standard. The training standard is the document which indicates the objectives and the contents to the trainers and learners alike, and it gives pedagogical instructions. The present training standards use learning outcomes and ECVET (European Credit system for Vocational Education and Training), aiming to strengthen the connection between the educational-training system and the work system [26].

The construction of standards reports itself to the professional didactics or to the various orientations regarding the professional activity, highlighting the coherence between training and the labour market, between theory and practice [16], [19]. The professional didactics focuses on the learner as an actor of his own training, analysing his own professional practice. The reflexive challenges enable the learner to acquire not only specific competences, but also to generate competences [2].

In the CO.PE project, conducted by the Politecnico Calzaturiero in Padova, Italy, in partnership with France, Romania and Spain, the elaboration of the professional activities standard, of the competence, certification and training standards by the partner teams aims at building a coherent transnational model, based on the professional didactics, using a common, articulate approach, which should allow the mobility of European citizens and the recognition of their qualifications, via the transparency of the training.

2. Objectives and methods

The aim of this article is to present the training standard as an instrument which connects work to training and to describe the procedures which define its essential elements. The used methods were the literature review, the study of the documents and the case study. Due to the fact that this instrument is not used in Romania, the current article presents an innovative case study for the occupation *manufacturer-assembler of textile fabrics*. The part of the training standards is completed in Romania by the occupational standard and the training programs, which offer some valuable information in the projecting, development and certification stages of the training.

3. The training standard

The training standard presents the coherent assembly of the competences to be acquired, grouped in training units which are divided into modules, in order to make personalised learning possible. The training standard does not insist on the values, norms and attitudes which condition the high performances. Its existence reduces the indetermination of the training activity, which has been frequently brought into discussion [6], [23] and it implicitly smoothens the training process at national level [11], thus enabling the assessment stage and the professional mobility [10].

The training standard guides the training of the people who want to perform a certain job, being common to various categories of actors in the educational field [7]. Concision is a condition of its accessibility [9]. The overall structure and the manner of construction of the training units, including examples for the studied case are widely described and argumented in the following paragraphs.

3.1. Modulation

The key element of the training standard is the training module, which is associated to a learning process. As the main unit of the training standard, the module prefigures the learning experiences. The aim of the standard is to guide the training in a coherent, but flexible manner, coming up with a minimum of pedagogical and methodological features which should ensure the quality of training and certification, thus validating the mutual trust among the training centers in various geographic areas [11].

3.2. Structure

Although it is a prescriptive document, the structure of the training standard does not lack variations. Without being unanimously accepted, the following structure is, however, recommended: the first part presents the aims of the standard, the educational intentions, the list of the competences to be acquired and the matrix of the training objectives. The second part describes the training units under the shape of modules [9].

The mandatory elements, identifiable in any training unit, are: the connection with the competence units, the estimated time length, the knowledge and abilities lists, the assessment methods and their associated criteria. Even though it prescribes numerous elements which strengthen the training, the standard stays flexible, giving the trainers the freedom to decide on the means of training.

In some educational-training systems, the previously listed elements are joined by: details concerning the professional activities and the related tasks, the associated ECVET or ECTS credits and the initial and final assessment tests for a module. The standard is sometimes accompanied by pedagogical guides, useful to the trainers, but optional, such as: the logogram (the order of modules, dependent on the relationship of the newly-acquired knowledge with the pre-requisites), the pedagogical methods, and activity scenarios [9], [17].

In the standard we have designed, the structure of the modules is unique and it gives the identification data and the module description.

1. The identification data: are expressed by means of a code with which the module is identified, made of the training unit number and the number of the given module (for example: UF2 M4);

• the name of the module, expressed in words, as briefly as possible, so as to favour its retentivity;
• the connection with the targeted competence and implicitly with its certification;

2. The presentation of the module is done using the following information:
• the objective of the training and the pedagogical objectives, expressed via behaviour;
• the length (the total time-span of the training and the division of the classes in theoretical and practical activities);
• the professional key situation to which the module is associated. The assembly of key situations has to cover the whole occupation);
• the prerequisites, whose potential was signalled long ago (Bloom, 1976). The prerequisites for a certain module introduce an order in which the training should be done, but the flexible nature of modular organisation allows the come-back to a revision module or submodule, if this come-back is required by the learning needs;
• the learning outcomes-LO;
• the activities and tasks related to the targeted competence;
• the knowledge and skills which define the competence are briefly described, so as to be understood by the learners; they are related to the module objective and to a certain professional situation;
• the assessment methods (briefly presented for the summative assessment only, as oral, written or practical examinations) and the assessment criteria.

Although there are no precise indications regarding the time-span of a module, it is recommended that it stays 'reasonable': a short-time span would fragment the training and would make the assessment process difficult; a long time-span would make knowledge acquisition and assessment difficult and would harden the mobility and social recognition of the training. Some Canadian documents give more precise recommendations, indicating a 30-hour time-span as minimal and a 120 hour time-span as maximal for one module [9].

In the CO.PE project standard we have allotted a double number of hours to the practical activities, conducted in the assembly plant or in the company, as compared to the theoretical activities held inside a classroom, due to the fact that the main element of exercising the occupation of manufacturer-assembler of textile fabrics is being able to work with the fabrics.

The use of professional didactics, which entail video recordings of the activity, self-confrontation and cross-confrontation, alternance in training and training based on actual work [4] constitute strong arguments in favour of the longer time-span allotted to the practical activities.

The training standard which we have proposed includes pedagogical instructions limited to the type of training (classroom assembly plant or both). We believe it is not recommended to include the pedagogical methods in the training module, we have not suggested a particular order for the modules and we did not develop the assessment techniques either, all these aspects being the decision of the trainer.

4. The design of the training standard

The analysis of the competence matrix for the occupation 'manufacturer-assembler of textile fabrics', specialised in protective equipment, indicates the fact that some competences are shared with other occupations (competences 1-5 from table 1) while others are specific to the occupation itself (competences 6-9 from table 1).

4.1. The shares of the competence units

In order to design the training standard, the introduction of the training units is necessary, because the training units project the acquisition of competences at global level. Due to the fact that the training duration may vary from one educational-training system to another, we have established the importance of each competence in completing the professional activity and the medium difficulty of its acquisition according to the experts, using a similar method to the one proposed by the COMINTER project (http://www. tg4transparency. com/project).

Table 1

The importance of competences in the occupation curriculum according to the shares attributed by experts

Competences	Shares given by experts (E)						Importance of competence
	E1	E2	E3	E4	E5	E6	
1. Teamwork	4	5	4	4	4	4	4.10
2. Interactive communication at the workplace	5	5	5	5	4	5	4.80
3. Planning of one's own activity	4	4	5	4	4	4	4.10
4. Respecting the Health and Safety at work norms	3	4	3	4	4	4	3.40
5. Maintainance and repairing of the sewing and the overcasting machine and of the sewing devices	4	5	5	5	4	5	4.70
6. The sewing of the work equipment	32	25	23	26	28	30	27.50
7. The overcast of the component parts of the product in different production stages	6	7	8	10	9	7	7.83
8. Performing the assembly operation	31	30	32	28	30	30	30.46
9. Finishing and preparing the product for Quality control submission	10	15	15	14	13	11	12.97
Total	100	100	100	100	100	100	**100**

In order to avoid bias, we have used the method of consulting the expert-trainers and the occupational experts. Each expert was asked to evaluate the importance of each competence in the occupational field, in percentages, so that the total sum of percentages be 100. The average of the shares attributed by the experts has thus become the share of the given competence in the occupational field.

The operationalisation of the concept 'the importance of a competence' in the analysed occupation was conducted in the in the following manner: the repeat rate of the activities corresponding to the analysed competence, the time-span of activities during a determined period (one day, one week), the impact of these activation on the technological process or on the final result.

The importance of each competence in the performance of the occupation was pondered with the EQF (European Qualification Frame), a complex factor which may be operationalised as follows:
- the complexity of knowledge and abilities which need to be acquired;
- the impact of the competence for the progress on other levels of the EQF;

- the level of responsibility and autonomy needed in performing the occupation, the workload required by the acquisition of the competence.

As shown in table 1, the average of the relative importance was multiplied by 2 (competence unit 5 *maintainance and repairing of the sewing machine, overcasting machine, and of the sewing devices)* or 3, for the other competence units; these numbers represent the EQF levels, already established in the competence standard. The new rounded-up data are presented in table 2. Using the classification factor of every competence, we have established the training hours and ECVET credits needed.

4.2. The Establishment of the training time-span and of the ECVET credits

The number of training hours was obtained reported to the total of 720 hours, present in the Romanian educational system for level 3 (table 2). The level of the occupation and of each competence was already established in the competence standard.

The ECVET credits are established based on the level of classification of each competence and depending on various criteria. For the first criterion experts in the occupational field were consulted, whereas for the other two criteria we have consulted the training experts. These criteria are: the complexity of learning imposed by the formation of competences and the relative importance of the targeted criteria for the labourmarket and for the access to higher levels of certification.

The ECVET credit allotion procedure reports itself to formal learning and considers the fact that 60 credits are given for the acquisitions obtained during a year of study, having a length of 800 to 1200 hours, and they are distributed to the competence units (table 2.).

4.3. The relationship between the competence units and the training units

The manner of transition from the competence units to the training units is variable in practice, various solutions being possible: (i) two-way correspondence between the competence units and the training units and (ii) the reunion of various competences in a training unit or the allotion of more training units for a single competence. The option for a solution or the other is not free from subjectivity, one relevant criteria seeming to be the unity which results from the training objectives and the connection to a key professional situation.

4.4. Learning outcomes

The wording of learning objectives allows the transition from the training based on content (what is taught) to the learning focused on results (what the students know, understand and are able to do at the end of the module)

The literature recommends the wording of 2 to 6 learning outcomes for every training unit and up to 25 outcomes for a whole program. When wording an outcome, one should use only one action verb and come up with a easy to understand statement.

The classic taxonomies [1], [3] are a valuable asset. The learning outcomes are connected to the evaluation criteria, via two types of correspondence (i) one-to-one between result and criterion and (ii) various criteria for every result. It is also possible to combine knowledge and abilities in the same evaluation criterion. The learning outcomes are also connected to the ECVET credits. These are numerical

representations of the relative values of the training units reported to the qualification as well as of the total value of learning outcomes for the entire qualification. The ECVET system gives credits to the qualifications, not to the educational and training programs. In the awarding of the ECVET credits for qualifications, the convention according to which 60 points are given to the expected learning outcomes of a whole Vocational Education and Training (VET) year is used.

The competence classification factor, established in report with the EQF level   Table 2

Competences	Importance of the competence	EQF level	Classification factor	ECVET		Duration
				Percentage values	Rounded-up score	
1. Teamwork	4.10	3	12.30	4.17	3	30
2 Interactive communication at the workplace	4.80	3	14.40	4.86	3	35
3. Planning of one's own activity	4.10	3	12.30	4.17	3	30
4. Respecting the Health and Safety at work norms	3.40	3	10.20	3.47	2	25
5. Maintainance and repairing of the sewing and the overcasting machine and of the sewing devices	4.80	2	9.60	3.19	2	23
6. The sewing of the work equipment	27.50	3	82.50	27.92	17	201
7. The overcast of the component parts of the product in different production stages	7.83	3	23.49	8.06	5	58
8 Performing the assembly operation	30.46	3	91.38	30.97	17	223
9. Finishing and preparing the product for Quality control submission	12.97	3	38.92	13.19	8	95
Totals	**100**	-	-	**100**	**60 credits**	**720 hours**

5. The training manner for the occupation of manufacturer-assembler of textile fabrics

In Romania, the standards are partially replaced either by the occupational standard which offers some useful information in the training and certification stages for a certain occupation, or by the scales 1 and 2, used in higher education [27].

In the design of the standard presented in the current article, we have opted for seven training units, which are slightly different from the competence units.

The arguments brought in favour of our solution are derived from the learning logic and from the way of performing at the workplace. Therefore, the competences *teamwork* (UC1) and *interactive communication at the workplace* (UC2) were introduced in the same training unit. They do not correspond to any specific

professional activities, being integrated and not easily separable one from the other. As far as the practise of communication skills during training is concerned, this seems easier to practice in situations close to the real context, therefore interated to the inter-personal and group interaction.

The componence unit *maintainance and repairing of the sewing and overcasting machine and of the sewing devices* (UC5) was not dealt with in an independent training unit.This competence seems easier to acquire if distributed to the training units 4, 5 and 6, thus avoiding the interference of knowledge and abilities. Furthermore, the manipulation of a device or machine would not have been possible without executing the activities for which thet were designed.

After the settling of the training units, of their individual duration and after the allotting of the ECVET credits, the component modules for every training unit were designed. The entire module set constitutes the training standard, to which we have added, for a better understanding, the description of the occupation, as was done in other previous studies [9]. Table 3 presents a training module, UF5-M1 (*the overcast of the components*), elaborated in the project CO.PE.

Module UF5-M1 (Overcast of components)   Table 3

Training unit UF5	ECVET Overcast		5 credits
UF5-M1 The overcast of the components	58 hours		5 ECVET credits
Connection to the CU	CU7 Overcast of components		
Module presentation			
Training objective	The acquisition of the overcast competence, in different stages, of the components to be assembled, using the adequate overcasting technique, the thread and needles fit for the type of fabric, in order to ensure the durability of the treads and give the final product a pleasant aspect.		
Learning objectives	At the end of the module, the students will be capable to: • briefly describe the structure of the overcasting machine • briefly explain its functioning • apply the overcasting machine maintainance instruction • identify functioning issues of the overcasting machine • find simple solutions to fix the functioning issues • prepare the components and fabrics needed in the overcasting process in different stages of the assembly • touch up the outline of the components if necessary • correctly apply the overcasting procedures and the decoration techniques • respect the health and safety issues when touching up the components and overcasting		
Means of training	20 hours in the classroom / training centre	38 hours in the assembly plant, using professional didactics	
Professional situation	The overcast of the component parts of the product in different stages of its assembly, using the overcasting machine		
Prerequisites	Elementary sewing skills Health and safety at work norms Work planning skills		

Activity and tasks	
The overcast of the component parts of the product in different stages of its assembly	
S1 Selection of the overcast components for every stage	
S2 Adjustment of the components to be overcast	
S3 The overcasting of all components	
Competences and subcompetences	
UC 7 The overcast	
UC71. Selection of the overcast components for every stage	
UC72 Adjustment of the components to be overcast	
UC73 The overcasting of all components	

Knowledge	Details (selection)
The overcasting machine, structure and functioning	Structure and functioning of the overcasting machine Accesories of the overcasting machine Types of needles and threads used for overcasting Maintainance of the overcasting machine Functioning issues of the overcasting machine
The overcasting as a phase of the technological confectioning process	Relations between overcasting and other activities Order of the overcasting of components
Preparation of the necessary components and fabrics	the right outline of the components to be overcast Tables comparing the seaming of fabrics, the needles and the thread
Overcasting techniques	Overcasting procedures Decoration techniques using beads, piping, folds, etc. Overcast quality assurance
Health and Safety at work norms	Health and safety at work issues in the touch-up of components and in the overcasting process

Abilities	
Touching-up of the components to be overcast	Order of the overcasting of components Touch-up of the components to be overcast
Application of the overcasting procedures	Execution of various types of overcasting Decoration techniques using beads, piping, folds

Summative evaluation methods		
Methods	**Assessment via oral and written examination**	**Practical evaluation (evaluation of the process and of the product)**
Evaluation Criteria	1. Description of all component parts of the overcasting machine 2. Brief explanation of the functioning manner of the overcasting machine 3. Description of the main maintainance techniques for the overcasting machine 4. Identification of the functioning issues of the overcasting machine 5. Fixing the functioning issues of the overcasting machine 6. Identification of the necessary round-ups of a component before being overcast 7. The description of some simple sewing techniques 8. The comparing of the thread, needles, seam in order to decide the type of seam 9. The description of the overcasting techniques 10. Application of the quality norms in the execution of the overcast	1. Preparation of the machine and accessories 2. The correct application of the maintainance procedures of the overcasting machine 3. The selection of the thread and needles according to the type of fabric and to the model to be executed 4. Execution of the test seam 5. The correct execution of the necessary cuts in order to round-up the components 6. The correct execution of various overcasting types 7. The precise overcasting of the entire outline of the chosen components for a certain stage 8. The execution of the decoration procedures 9. The final check of the overcasting seam of the components.

6. The validation of the training standard

A good training standard is coherent, pertinent, applicable and feasible [9]. The validation of the training standard can be done by using the method of consulting the experts, with groups of expert trainers and experts of a particular occupational field who have participated in the work analysis. The coherence, the pertinent nature and the applicability of the standard can be assessed. The assessment of the pertinent nature will be done with the intervention of experts in the given occupational field and will use criteria such as: the relevance of professional situations for the main targeted competence, the adequacy of knowledge and abilities, and the adequacy of the evaluation criteria. The assessment of coherence falls under the responsibility of the trainers and it targets, the allotion of hours for theoretical and practical activities, the adequacy of methods and of the evaluation criteria.

7. Conclusions

The perspective of training based on competences has gained popularity as an alternative to the behaviourist perspective. Although there is no unanimous defition of 'competences', most specialists agree on the fact that knowledge, abilities and attitudes are all part of 'competence'. Various types of standards which establish connections between the labourmarket and training were elaborated based on the competence perspective, thus reducing the criticism resulting from various perspectives.

Due to the fact that Romania does not officially use the training standard, although it exists as a product of some projects, we have presented the design method and have exemplified via the description of a module specific for the training of manufacturer-assembler for textile fabrics, specialised on protective equipment.

On long term, the training standard could contribute to a better efficacy of the educational-training system in Romania and in the partner countries, offering a coherent transnational model, built on the basis of recent indicators in the European space: EQF, L.O. and ECVET.

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