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## E. Competency-based training

# 35

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### **What is a national training system?**

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The answer should be divided into two parts: the first one offers a conceptual view of “training system” and the second one refers to competency-based training.

#### *The concept of: “system”*

The term system is often used in different areas such as that of vocational training. The most common way is through the promotion of institutional structures to which we refer to as “systems”.

The first reference we should look at when creating this kind of organisation is the theory of systems, according to which the effect obtained by means of the interaction among structured parts of a system implies that the whole is greater

According to the theory of systems, organisations are structures made up by components (sub-systems) with specialised duties and which work integrated in a harmonious way. This approach offers the grounds to explain the success or failure of an organisation due to, for instance, an inadequate interaction between parts.

In accordance with this theory, an organisation is a social system in charge of fulfilling a particular purpose. In order to do this, the organisation has several specialised bodies which are “systemically” integrated and which make up a collection capable of achieving better results than the ones that would be obtained by working separately.

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than the simple total number of parts. This effect is known as the holistic property or synergy.

For the supporters of this theory, systems are living things, machines, and in general any arrangement that complies with the above mentioned result known as holism or synergy.

During the 60s, the so-called Theory of systems was widely used in the field of theories of organisation. The theories about how organisations work were originated when Taylor and Fayol attempted to explain the fundamental principles that regulated business organisations and led them to a higher productivity thus creating the so-called Scientific Management.

In fact, a system represents a visible characteristic of how organisations work rather than a substantial concept. A systemic organisation is perfectly articulated; the antithesis of a hierarchical and segmented organisation where communications are slow and the structure is rigid. An organisation may be understood and managed as a system but creating a “system” in order to substitute it for an organisation is conceptually mistaken.

### *A national training system*

A vocational training system is an organisational arrangement in which several actors are combined with training offers which are coordinated as to their relevance, contents, level and quality; in such a way, as a whole, they achieve a greater effect in the development of labour abilities of workers than they would if they acted separately. We refer to a standardised system when the system agrees with the use of labour competency standards in order to set the grounds for the drawing up of programmes, training, assessment and certification.

Training systems do not necessarily imply the creation of new institutions; in fact, it represents a mechanism which joins, articulates and regulates the multiple offers and levels of quality that exist.

In this case, the State plays a fundamental role by becoming a promoter and facilitator of the rules of the game for the system and reserving the power for the definition of policies and guidelines before actually taking part in the implementation of actions. One of the main objectives of public administration is ensuring that the training market works adequately.<sup>1</sup>

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<sup>1</sup> Hassan, Abrar, *Evolución de los mercados de trabajo y la política de educación y formación*, CEDEFOP, in Revista de Formación Profesional, 1994.

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It is possible to distinguish three levels within a training system. The political level, represented by a management body; the executive level, made up by sectoral body representatives of production and services; and an operational level constituted by training institutions, certifying bodies and assessment centres.

A vocational training system needs a **management level** in charge of setting policies and defining scopes, priorities and resources allocation. This management level is usually a participation scenario in which workers, employers and the government establish the “rules of the game” which are later approved by legal standards. The management board establishes how the system is made up and the officers are in charge of training, assessing and certifying. The participation of the State is really desirable since it is an excellent opportunity to regulate aspects such as access, fairness, quality and transparency.

Its tasks are oriented to the creation of conditions and general rules regarding how the system works. The main prevailing objective should be improving competitiveness by training workers. This level usually becomes a Board of Directors with representatives from entrepreneurs, workers and the government.

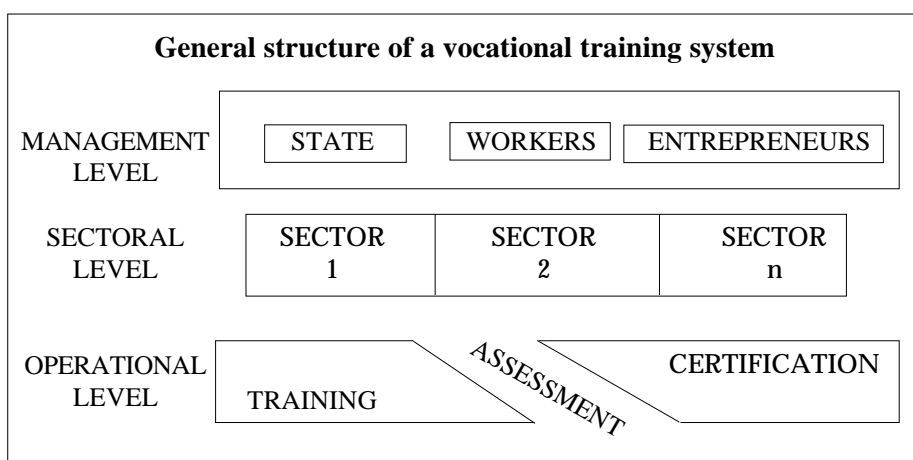
It is advisable that the management level is made up by the highest representatives from entrepreneurs (associations or chambers), workers (trade unions) and the government (ministries). This guarantees that it will still be oriented towards the creation of policy frameworks and consensus promotion.

The system also requires a sectoral level which should generally be involved in determining training needs, drawing up occupational descriptions which could later be developed as competency standards and coordinating training actions for a specific economic sector. This level is perfect for the participation of entrepreneurial chambers or associations and sectoral trade unions (for example, leather, footwear, plastic, paper, trade, building and hotel industry, etc.) as it results in a better organisation of the definition of competency, training and certification standards. A tripartite representation is also desirable; in this way, the interaction developed can approach the needs of specific economic sectors and/or particular geographic areas in a better way.

The bodies of the sectoral level define labour competency profiles for the specific occupations of each sector. These profiles become competency standards if they are adopted by common agreement for training, assessment and certification processes; they create a common language among entrepreneurs, workers and training institutions.

Activities for the identification of competencies are carried out under their coordination by means of the already existing systems (Functional Analysis, DACUM, AMOD, SCID). Therefore, they have the advantage of establishing the required competencies directly with the enterprises that belong to the corresponding occupational sector, and thus the standardisation process is developed.

In order to establish competencies in an appropriate way, this sectoral representation guarantees a greater participation of entrepreneurs and workers in occupational analysis and in the definition of training contents.



A third level is in charge of **operations**; three key activities for the system are carried out at this level: training, competency assessment and certification

The operational level has clearly defined inputs which are guaranteed by sectoral bodies, such as: competency standards, efficiency and quality indicators, methodologies of quality accreditation, clear certification criteria and a cost or price system which can be complemented with subsidies that may facilitate the access of groups at risk of exclusion.

The concept of certification is also shaped at the operational level; one of the main decisions in the design of systems refers to what can be certified and what is certified.<sup>2</sup> In general, training institutions give great importance to the recognition of competencies of workers; and that is in fact the main value given by participants since a clear competency certification system facilitates labour mobility and, therefore, employability.

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In fact, there is not a unique and better formula for the organisation of training institutionality. They all have in common the search for better quality, coverage and relevance; and of course, there are different ways of achieving such ideals. If we look at the institutionalisation carried out in different countries, which are many times taken as stimulating models, it is important to consider that such institutionality is the result of culturally accepted practices within the educational and training scope.<sup>3</sup>

It is also important to consider that recent reorganisations and worries about training systems are derived from national diagnoses which have revealed some of the following aspects:

- an increase in training offers of different quality and little coordination among themselves and with national objectives;
- an inappropriate relationship between the training offer and economic needs, expressed in the demand for trained workers;
- a loss or low level of competitiveness of the economy, often expressed in low levels of training and poor productivity performance;
- signs of exhaustion in training systems currently being used.

The orientation towards results of a training system is so crucial that certification should allow and encourage building up mechanisms in order to prove the competencies of workers, no matter how these were acquired. It is therefore possible to include self-learning processes, labour experience as a creator of competencies and flexibility in training actions.

These three levels of a training system are coordinated and work with articulated objectives and plans. Their autonomy is given at an operational level by the joined definition of needs and actions. In any case, they work in environments where the rules and the quality, relevance and improvement of access conditions are known and clearly dealt with. In short, it is a setting where “everybody plays the same notes.”<sup>4</sup>

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<sup>2</sup> In fact, institutional structures will depend on the preferences of each country (for instance, regarding the separation of training from assessment).

<sup>3</sup> This part was developed based on: “Cuatro afirmaciones sobre certificación. Todas falsas”, *Cinterfor/ILO’s Bulletin*, N°153, 2002.

<sup>4</sup> Irigoien, María; Vargas, Fernando, *Competencia Laboral. Manual de conceptos, métodos y aplicaciones en el sector salud*, Montevideo, OPS-Cinterfor/ILO, 2002.

# 36

## How do competency standards relate to curriculum design?

### 36. How do competency standards relate to curriculum design?

The transposition process of occupational descriptions usually included in a competency standard in order to design a training curriculum is one of the areas that should be developed and until very recently they have little methodological references.

Competency standards are obviously fundamental in the drawing up of training curricula. However, the process of curriculum design based on competency standards is by no means a lineal or automatic process.

Among other things, the curriculum design of a particular programme does not need to “provide everything”; it should try to identify what is essential to develop the required competencies.<sup>5</sup> Some questions give great support to the curriculum design:

What competencies need to be developed? What knowledge should be applied? What skills should the person master? What attitudes should the person show?

A curriculum is usually –and we should say: necessarily– structured in modules. Competency-based training is mainly possible by means of modular organisation of curricula. The first attempts to link **competency units** and **training modules** actually took place in curriculum design. In general, this is the

By explicit curriculum we mean a deliberate group of learning opportunities offered to a person or a group of persons for a particular development. The hidden curriculum (implicit) is made up by the institutional atmosphere, the management style of the educational centre, human relationships.

Irigoin; Vargas (2002).

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first attempt of transposition that seems to be useful to develop, although experience shows that a competency unit may produce one or many modules. In any case, like in the competencies analysis, the term competency unit implies a meaningful labour result. In curriculum design, the module should make sense on its own and have the ability to be structured in association with others when building up a particular curriculum trail.

The term *module* aims at flexibility by means of the ability to combine one element with another, and at the same time maintain the independence by which it may exist on its own.

Irigoin (2002).

In general, all the components of a competency standard contribute with valuable information for the curriculum design. Although it is not possible to think of a direct link between competency units and modules or between competency elements and learning objectives, it is feasible, through a sensible analysis, to achieve training curricula taking into account the conditions of competency standards.

An aspect which requires special attention is that referred to the shaping up of attitudes and personal abilities such as the initiative, the willingness for cooperation, the creation of a positive working atmosphere, creativeness and problem-solving. These attitudes are usually created more by means of the educational strategies used than with the contents themselves. Remember the concept of hidden curriculum; it is very unlikely that the initiative ability is developed if no questions are asked, no problems are raised and if team work and the search for alternatives to different situations are not promoted throughout the training process.

The key issues underlying the creation of personal competencies are: pleasant and educational atmospheres, qualified and motivated teachers, problem-solving-based learning, the use of several pedagogical means and training techniques.

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### *Description of some methodologies of curriculum design*

Several methodologies will now be described, for instance those used by INEM, SENA, CONALEP, SENAI and finally the labour competencies programme which is being drawn up in Argentina.

According to the model of occupational vocational training from **INEM, Spain**,<sup>6</sup> this process is called “derivation of training contents based on vocational profiles”. The vocational profile has been defined by inputs such as: occupational analysis, an occupational future revision which ends up defining vocational areas and great groups of occupations related to a process or a productive activity with vocational contents in common.

Besides, for each occupation, a vocational profile is described by defining the occupation, the general competency for the occupation, its competency units, its vocational accomplishments (elements of competency), execution criteria and vocational abilities. These aspects are similar to the ones used by the English and Mexican system.

Based on this vocational profile, training contents are drawn up by establishing the necessary theoretical and practical professional knowledge for a competent performance of units. In order to do this, the unit of competency is taken as the grounds for the analysis and the following questions are answered.

What does the worker need to **know** in order to establish the theoretical knowledge?

What does the worker need to **know how to do** in order to establish the practical knowledge?

How does the worker need to **know how to be and act** in order to specify the required attitudes and behaviours?

After that, training contents are structured in professional modules. In general, the relationship created between the module and the competency unit is such that one or more professional modules can correspond to a unit.

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### INEM. Professional module definition

It is the set of professional knowledge that when educationally structured:

- respond to an important stage in the working process;
- represent a major part of the learning process;
- are the basic units for assessment.

A professional module has got:

- a general objective;
- specific objectives;
- training contents for each of the specific objective.

Finally, the training pathways are established: a sequence of modules educationally organised, aiming to train for the performance of an occupation.

The experience of curricular transposition in Mexico can be shown by means of the proposal brought forward by **Colegio Nacional de Educación Profesional Técnica (CONALEP)** which drew up a method for the elaboration of training courses based on competency standards.<sup>7</sup>

The method was the result of a thorough analysis of other international experiences and several educational approaches. After establishing and comparing the needs to provide training based on real demands, and identifying and analysing the current labour competency standard for a particular occupational area, the method suggests outlining training modules according to competency units.

The general objective of the course can be defined by bringing it into line with the competency unit or even with elements of competency; this will depend on the level at which it is defined. Therefore, the objectives of the course are similar to the contents described in the corresponding competency unit.

Along the same lines, elements of competency are used as points of reference in order to establish the modules. The specific objectives of the course, the contents and the learning results are settled based on the analysis of the

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<sup>7</sup> CONOCER, *Análisis ocupacional y funcional del trabajo*, Madrid, IBERFOP-OEI, 1998.

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evidence of performance, performance criteria, the necessary knowledge and the field of application.

The curriculum design carried out by CONALEP can be described in the following steps:

- Definition of training needs of the production and service sector.
- Verification of the needs regarding the offer and training policies of CONALEP.
- Identification and revision of the Labour Competency Technical Standard (LCTS).
- Definition of the name of the course.
- Design of general objective.
- Design of contents and definition of modules and/or learning units.
- Definition of particular (or specific) objectives.
- Definition of specific objectives.
- Structuring of assessment criteria.
- Design of a descriptive letter.
- Acquisition or drawing up of educational material.
- Verification and proposal of equipment and/or adaptation.
- Definition of the characteristics of the candidate.
- Definition of the characteristics of the trainer.
- Execution of the training course.
- Assessment practices.
- Feedback process is carried out.

SENA, Colombia, sets the following steps in its Manual to design curricular structures and training modules for the development of competencies.<sup>8</sup>

- Interpret the points of reference for curricular design (units, elements of competency, level of qualification).
- Define an occupational profile (the exit profile of the worker-student).
- Define the curriculum structure. It should be made up by basic modules and by institutional policy, mainstreaming and specific training modules.

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SENA considers that each competency unit brings about one training module.

- Define entrance profile.
- Verify technically and methodologically the curriculum structure.
- Select module to be designed within the curriculum structure.
- Draw up the development diagram. It allows to observe the coherence between the working process and the training process.
- Define learning units. Every unit has a beginning and an end, with a complete meaning, since it expresses a sequence which is integrated in all the internal processes.
- Technical and methodological verification of learning units.
- Build up the knowledge chart for each learning unit. Concepts, theories, cognitive and practical procedures, attitudes and values related to the process (know how to do, learn and be).
- Settle learning results for each learning unit.
- Establish training procedure for each learning unit.
- Plan teaching-learning-assessment activities.
- Verify the process technically and methodologically.
- Define contents for teaching-learning-assessing activities.
- Settle assessment criteria.
- Define learning evidences.
- Select assessment techniques and instruments.
- Suggest methodological strategies.
- Define learning environments.
- Select and prescribe teaching materials and educational resources.
- Define training times.
- Define the trainer's profile.
- Verify each training module, both technically and methodologically.
- Present the design products to the Technical Committee of the Centre.
- Approve products.
- Revision and updating.

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In 2002, **SENAI, Brazil**, developed a methodology for the elaboration of competency-based curriculum design,<sup>9</sup> and they were careful to make it different from the curricular design based on occupational profiles. According to SENAI, occupational profiles traditionally describe the tasks assigned to a job position, directly indicating the contents and learning processes. On the other hand, competency-based vocational profiles are focused on the results that the worker must show in a productive activity and it is not attached to a specific professional situation since it considers the ability of transferring from one situation to another. Therefore, the vocational profile must have a forward-looking view, which incorporates a prospective dimension from an educational point of view.<sup>10</sup> In Brazil, the curricular design in vocational education should preferably be in modules, according to the legal regulations of vocational education.<sup>11</sup>

Curriculum design consists in understanding the training offer which should foster the development of competencies that make up a vocational profile. It has to do with decoding information from the labour world into the educational world by pedagogically translating the competencies of the vocational profile.  
SENAI, 2002.

The design is elaborated based on the vocational profile established by the participation of a Sectoral Technical Committee and by means of a Functional Analysis methodology. The vocational profile is the description of the accomplishments that a worker should be able to obtain and it is integrated by the required competency units and by the working context.

The methodology used in order to develop a curricular design covers the following stages:

- Analysis of a vocational qualification profile: in its structure, the competency units and types of competencies (basic, specific and management) covered by it. This provides important information regarding the number and types of modules to be suggested for design as well as the definition of curricular units.
- Definition of the modules that would be part of the training offer: Considering two types of modules: basic and specific. The basic module has no

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<sup>9</sup> SENAI, *Metodologia de Elaboração de Desenho Curricular Baseado em Competências*, Brasília, 2002.

<sup>10</sup> SENAI, *op. cit.*

<sup>11</sup> Federal Decree 2.208/97 that regulates vocational education.

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final effects regarding labour insertion, it aims to develop basic competencies –technical and scientific foundations– and therefore it is a prerequisite for specific modules. Specific modules are defined according to the job opportunities that cater for the vocational profile. These job opportunities make such modules likely to have a final effect according to the occupational opportunity it may be.

- Definition of curricular units regarding modules. They are pedagogical units which build up the curriculum; they are made up by coherent and meaningful sets of knowledge, skills and vocational attitudes; they are independent in terms of training and assessment throughout the learning process. Curricular units of specific modules are suggested based on competency units, taking into account specific and management competencies. Every competency unit is associated with one or more than one curricular units according to their degree of complexity. It is suggested, that if possible, the name of each curricular unit should be associated with the name of competency unit.
- Internal organisation of curricular units: It covers the definition of a) educational objectives, which are described by a verb, as well as the contents of each objective. Both general and specific educational objectives cater for the structure of vocational profile in competency units and elements of competency, respectively; b) assessment criteria, which determine the boundaries for the verification of the scope of the objectives and which are defined according to the learning process dynamics and the performance criteria that are part of the vocational profile; c) training contents of curricular units, in which it is important to formulate educational strategies that may lead to the development of management competencies; d) educational methodologies and strategies to be adopted which might include modalities such as distance-learning, in-company training, alternation and one-to-one learning methodologies; e) teaching resources; f) educational environments; g) equipment, machines, tools and instruments; and h) timetables.
- Organisation of the training schedule: that is, the sequence of development suggested by the set of modules related to a vocational qualification, which, in an educational order, train people to apply a particular qualification. The curricular units can be taken separately and, if necessary, the schedule must define its relationship and sequence.
- Elaboration of the course plan, which includes the foundations and objectives, entrance requirements, exit profile, curricular organisation, valida-

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tion criteria of experience-acquired knowledge, assessment criteria of the course and description of the certification offered.

- **Quality control:** It is done in the long-term, it consists in guaranteeing that each stage is developed according to the methodology. The curricular design is presented before the Sectoral Technical Committee for them to study it and make any remarks.

The **Programa de Formación y Certificación de Competencias Laborales in Argentina**<sup>12</sup> (Training and Labour Competencies Certification Programme of Argentina) elaborated a methodology of curricular design; its objective was developing the abilities that allow for a competent performance at work. The curriculum design includes four components:

1. A reference framework made up by the description of characteristics of the productive context and the professional role as well as the theoretical definitions of the authors regarding the design.
2. The integrating abilities that are developed throughout the training process, that is “the training intention” of the corresponding curriculum design. These are the basis for assessment and accreditation of learning.
3. The curriculum structure, set in modules.
4. The course load for each module and the complete curriculum.

Competency-based curriculum design is by definition a modular design; this establishes the necessary flexibility to allow progressive learning, to admit the recognition of acquired competencies in every-day practices and to facilitate the mobility within a continuing training.

This experience regards the module as an autonomous unit which is meaningful on its own and is articulated with the other modules that are part of the design. Training objectives of each module are related to the units and elements of competency and these can be analysed separately.

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<sup>12</sup> The programme was financed by IADB/MIF and covered experiences from the following sectors: metal, food, motor vehicle and printing industry.

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### 37. What are the challenges posed by labour competencies to vocational training?

Unlike the traditionally academicist<sup>13</sup> orientation that many training programmes may have, competency-based training programmes should have the following characteristics:

- Approach labour performance and not course contents.
- Improve the importance of what is learnt.
- Avoid traditional division of academicist programmes.
- Facilitate the integration of contents applicable to work.
- Generate learning applicable to complex situations.
- Foster individuals' autonomy.
- Change teachers' role into a learning facilitator mode.

Mertens<sup>14</sup> mentioned some of the characteristics proposed for competency-based training programmes:

- Carefully identified, verified and well-known competencies.
- Training oriented to the development of each competency and an individual assessment for each competency.
- Assessment considers the knowledge, attitudes and performance as main sources of evidence.
- Students progress at their own pace along the programme.
- Training is as individualised as possible.
- There is a strong emphasis on results.
- It requires workers' participation in the elaboration of learning strategies.
- Learning experiences are oriented by continuous feedback.

**What are the challenges posed by labour competencies to vocational training?**

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<sup>13</sup> It refers to the orientation that focuses on contents of theory or technical subjects without articulating these and without considering its application in the labour world.

<sup>14</sup> Mertens, Leonard, *Competencia Laboral: Sistemas, surgimiento y modelos*, Montevideo, Cinterfor/ILO, 1997.

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For instance, SENAI believes that there is a need to change from the qualification approach, which implies orderly and systematically imparting skills, manual abilities and applied knowledge for the performance of prescribed tasks at specific job positions, to a broader approach which promotes competency and favours versatility.

In Chile,<sup>15</sup> within the framework of the Chile Califica Programme a team from the Ministry of Education elaborated a guide for the design of schedules within the scope of technical secondary education. Here, the vocational profile, the information which exemplifies employment dynamics as well as the productive development trends of each sector are considered as inputs of curriculum design. The methodology is modular in order to facilitate the integration of different components of competency (knowledge, skills and attitudes) and to foster the curricular articulation with other training levels and methods.

The final objective of curriculum design is to reach a particular exit profile understood as the set of abilities that a graduate should hold when completing a plan of studies that may allow him to obtain a degree (of middle or superior level) identified by means of required competencies.

In short, the generation of competencies by training programmes demands changing their educational strategies, their curricular approaches and the traditional role given to the teacher and the student; it implies the use of a great variety of learning materials combined with the orientation of learning towards problem solving rather than to the repetition of contents.

Traditional means of educational management, based on a group as a unit and as the grounds for the planning of actions and courses, are being challenged so that they allow an individual management of the advances accomplished by students and their easy re-entrance into programmes that should be modular and open.

Competency-based training implies that the orientation of programmes aims at the development of abilities which may be applicable to a wide range of labour situations involved in the environment of an occupation. The modular aspect of this kind of training gives the chance to manage it with a greater flexibility, it allows for the recognition of experience and the training in modules of immediate application at work which, since they are interconnected, may facilitate the progress of a worker in completing a training pathway.

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<sup>15</sup> Chile Califica, *Diseño de itinerarios de formación técnica. Documento de Trabajo*, Santiago, 2004.