PROJECTS-BASED TRAINING AND LEARNING EVALUATION[1]

"It is necessary to develop the question's pedagogy.
We are always listening to the answer's pedagogy.
Teachers answer questions students have not asked".
(FREIRE, 2017)

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Abstract

The core of this article is the evaluation as an integral part of project-basic training, and for this, it takes back basic concepts and those that theoretically support it. The reflection begins by defining what the training for projects is for the National Training Service of Colombia (Sena) in their different phases, to approach from there the steps defined for the evaluation process of training and the learner integration, finally outlining the challenges that in practice represent, for the instructor, its implementation.

Keywords: Project-basic training. Pedagogical strategies. Sena. Project method. Learning evaluation.

1. Introduction

The National Training Service (Sena)'s mission is established in Law 119 of 1994, in the following terms:

> [...] to fulfill the State's role of investing in the social and technical development of Colombian workers, offering and executing comprehensive professional training, for people's incorporation and development in productive activities that contribute to the country's social, economic and technological development (COLOMBIA, 1994, article 2).

In order to achieve this social responsibility, Sena should guide training programs for the development of the learners and workers' skills, similar situation to the competent personnel's certification meeting the productive sector's current and future needs; process necessarily mediated by the evaluation of learning as an essential

and inherent part of the training. An evaluation that should make it a priority to promote learning in its design and practice (MORENO OLIVOS, 2016).

Since the 1990s, Sena has been working on the strategy of project-based training in labor skills development scope. With the methodological strategy of project-basic training, the institution intends to transcend the merely formalist vision of the educational process and the administrative pressure by measuring the results, which in some cases do not know the possibilities of the learner's creativity (MORENO OLIVOS, 2016). It is proposed that learners acquire skills in a simulated productive environment, called "The training project", a meeting point between training and work, while at the same time seeking to promote an evaluation system for obtaining skills, which responds to the very dynamics of the knowledge construction within the process (AMORÓS, 2011).

2. Project-basic training

For Sena, project-basic training is:

> [...] a nuclear or agglutinative methodological strategy of a new training model, seeking to give a correct answer to the new demands that emerge of the socioeconomic changes caused by the globalization (SENA, 2007, p. 24).

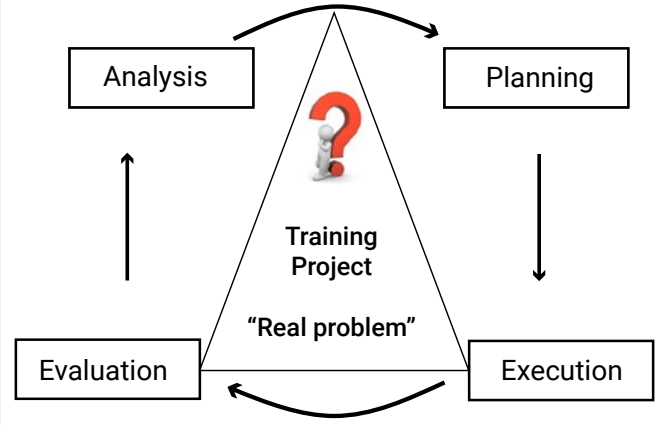
Thus, learning is part of the productive context of recognizing that competences are only measurable in action, from a perspective that is not only technical but also ethical and social (ZAPATA PÉREZ, 2017). This means that the learner not only develops the knowledge, skills, abilities and talents, but the combination of all these elements in a specific context, assuming from the ethical the responsibilities of acting.

The training project, as an excuse for learning, integrates the competences of a didactic structure, consistently with the productive process and the training in action, and breaks the dichotomy between theoretical and practical, when confronting the learner with a "real problem" allowing him/her to develop the capacity to understand, process, select, organize and transform knowledge, apply it to different situations and contexts due to the values and intentions of the personal or social projects themselves (MORENO OLIVOS, 2016).

The project-based training methodology allows then the creation of a mental structure for the problem solution, the own knowledge construction and the new demands recognition for the updating of the labor competencies from the productive processes.

To the project-based training as pedagogical strategy, Sena responds to the planning of the steps highlighted in Figure 1.

Figura 1 - Steps in project-based training



Source: Own depiction.

The learner is located in a specific context to solve the problem, methodologically crossing the following steps:

- Analysis: At this stage the instructor presents the training project proposal designed by the team executing the training; the learner studies the problem, validates or adjusts the proposal and, with the instructor's monitoring, collects pertinent information that can bring it to solution, reviews possible alternatives, and selects the most viable.
- Planning: The learner, assisted by the instructor, carries out the planning of the activities to be developed and defines the work schedule, identifying the dates and resources for its management.
- Execution: The learner develops the planned activities with the guidance of the instructors' executing team.
- Evaluation and control: At this stage, learners and instructors carry out the reflection of the whole process, related to the revision of the objectives, the results achieved and the aspects to be improved in the future.

Through this course, it is intended to create in the learners enough skills to learn, but also to unlearn in a flexible way, according to the context changes and the complex situations' demands, which are not only to be understood, but also involve the mobilization of all their knowledge to be able to solve them in the best possible way, within the defined parameters and limitations imposed by the context of the training project (ZAPATA PÉREZ, 2017).

One of the project-based training benefits is the methodology for evaluating learning, hence the importance of reviewing the steps that must be taken to properly develop the process, while the model requires the integration of the learner and the permanent monitoring of the instructor to achieve within the training period, in coherence with the teaching-learning model, evaluate the learner's ability to analyze and seek solutions

in the procedure and not only the result of the recognized exercise in the training project. In the words of Fernández López (2017), not focusing the evaluation on the final score, but validating the method and guiding the learner during the process.

This situation allows a wide margin so that, from the educational practice, the instructor facilitates knowledge construction, encompassing the perspective of learning to know, learning to do, learning to live, learning to be (DELORS, 1996); in this sense, the evaluation of learning is a very important factor for the project-based training strategy, as it develops tools and techniques for monitoring, verifying and achieving skills.

3. Training evaluation

The evaluation process should be considered a central issue in the professional educator profile (MORENO OLIVOS, 2016). Evaluation is not the final moment of a process, and even if it were, it should be the beginning of a new, richer and more informed process (SANTOS GUERRA, 2002).

Traditionally, learning evaluation seeks to "measure" what is learned according to the "quantity" of knowledge, privileging anyhow the memory aspects. Here, evaluation has a privileged weight for most students, many of whom continue to learn for the evaluation (MORENO OLIVOS, 2016). From this perspective, evaluation constitutes an instrument of power, qualifying or disqualifying with a judgment of absolute value (Approved/Reproved), a view that with different nuances is maintained in the Colombian educational system, while certification remains one of the requirements to access the working field in many cases.

As the center of the training, the learner is the manager of his/her own learning process

Unlike this situation, in the strategy of project-based training, the evaluation is the result of observation, analysis, and evaluation of the evidence collected during the training project process transcending the memorial act, describing the degree of skills ownership, which will allow the learner to develop himself/herself in the labor and social context for the future. He/she is prepared to make decisions that can serve as support for lifelong learning (MORENO OLIVOS, 2016).

As the center of the training, the learner is the manager of his/her own learning process. The instructor acquires the mediator or facilitator character, and must assume the huge responsibility of evaluating the evidence based on the evaluation criteria established in the curriculum, which is structured according to the competencies defined by the productive sector.

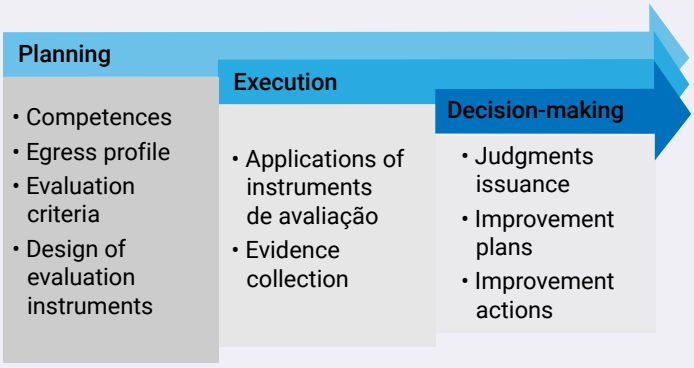
3.1 Evaluation steps

In order for the instructor to fulfill the huge commitment to evaluate, it was institutionally established a cycle or set of steps that must be performed to verify the evidence allowing the comprehensively assess whether the learner has achieved defined levels of knowledge, skills, attitudes, and values.

When developing these different steps, the instructor makes the evaluation a continuous and parallel pedagogical act in the confrontation of standards and in the achievement of valuable work skills throughout the training process. This is where the learner can demonstrate the capabilities and abilities to understand and apply the skills, as well as the project's own result.

Figure 2 shows schematically the evaluation steps, separated by a purely explanatory purpose, since they are performed simultaneously with the activities carried out by the learners with the instructor's guidance during the whole training, from a pedagogical feedback to the teaching/learning process, to decision-making with the learner and continuous improvement.

Figura 2 - Evaluation steps



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3.1.1 Planning

The evaluation planning assumes a preponderant value and involves the revision and analysis of the elements of the curricular design and the instruments creation by the instructor. As an example, for a technology course in Graphic Development of architectural and engineering projects, the elements to be considered are the following:

- The technical and transversal competences for the case of the technologist in graphic development are: Measure, Develop digital presentation techniques, Express information about construction projects, Acquire, Organize resources, Promote appropriate interaction, Understand and produce texts in English.
- The egress profile: Defines the desired characteristics, starting from a holistic vision that facilitates the future graduated to compete in the labor market with a high professional level. In addition, with entrepreneurial conditions to create his/her own projects. In the case of the technologist, the egress profile becomes qualified human talent for developing construction projects with support to architects, engineers, and industrial designers, adding regulatory components

and technological advances, free citizens, with critical capacity, solidarity and entrepreneurs.

- Evaluation criteria: Are those indicating the achievement level that the learners must achieve during the training process, defined from the curricular design, for the learner to manage them, knowing in advance the clear and objective rules established by the techniques, criteria, moments and expected results of different knowledge comprising the competence: knowing, doing, being. These criteria are the reference for the instructor to objectively evaluate the advances in the competences acquisition besides being found in the design, for example. For the "Developing Digital Presentation Techniques in Construction Projects" technical competence, the criteria are:
    - Apply basic photography concepts for imaging. Identify and manage peripheral equipment and tools, use modeling, animation, rendering, image and video editing programs.
    - Apply color, brightness, lighting and textures to virtual 3D models to create scenes simulating real conditions.
    - Define timeline and sequence parameters in animation by using audio tracks in virtual presentations.
    - Use computer tools to display images and videos and configure print parameters according to advertising and sales criteria.
- Designing evaluation tools: It is the construction of tools allowing systematically collect the evidence and experiences of the learner during training, from the integration of knowledge, skills, abilities, attitudes and values in the productive context associated with the project, in such a way that the instructor can infer, under a reasonable and objective judgment and in training times, the coherence of the exit profile, the curriculum design and the learner achievements. In this sense, any instrument and actor are valid, once they provide information not only on quantity but also on progress quality. For the Technologist in Graphic Development, they are evidenced by a checklist in the assigned project final delivery, in a virtual model.

3.1.2 Execution step

Developing the evaluation requires the instruments implementation, depending not only of the advanced learning activity at the moment, but also of the knowledge the instructor has on his/her learners and it is where it can, from a proactive perspective, enrich the process. This is the margin on which the project method allows to develop a pedagogical dialogue and to build knowledge. To achieve this, it is important:

- Self-diagnosis: The learner begins his/her process with an amount of previous knowledge, experiences, interests, prejudices or beliefs of his/her cultural environment. However, it can incorporate new knowledge and this information is the starting point for the instructor to evaluate and adjust their interaction as

an agent, that activates them, from an open dialogue, and plan how to integrate it into the state of the art or discipline's technique or technology and the criteria established from the competences guiding the curricular design.

- The instructor's recognition of learning styles; this is how the learner appropriates meaningful knowledge as a single individual and is responsible for managing the "learning to learn" process, enhancing his/her professional and personal development.
- The organization of assertive work teams favoring social interaction during learning and constructive criticism, for skills development and the experience of ethical principles and social values with an ethical aspect, demanding the collaborative skills development for the most appropriate solution to the problems that arise.
- The integration of information technologies as one of the sources knowledge, which evolve and change so quickly, shows that accumulation is not important, since they are available, but rather the development of skills for its transfer to other contexts (MORENO OLIVOS, 2016).

Evaluation is part of the ongoing dialogue between the learner and the instructor, who, through properly planned instruments, collects objective evidence of the expected achievements, respecting individualities and learning rhythms, to give feedback to the process.

Thus understood, the evaluation allows:

- To the learner, in a timely manner, recognize error as another knowledge source, evaluating not only what he/she learns, but also how it is learned, his/her strengths and weaknesses to address new situations in the future.

Evaluation is part of the ongoing dialogue between the learner and the instructor

- To the instructor, enough autonomy to soften in each specific case his/her actions according to the learning styles and the context of the knowledge construction.

3.1.3 Decision-making

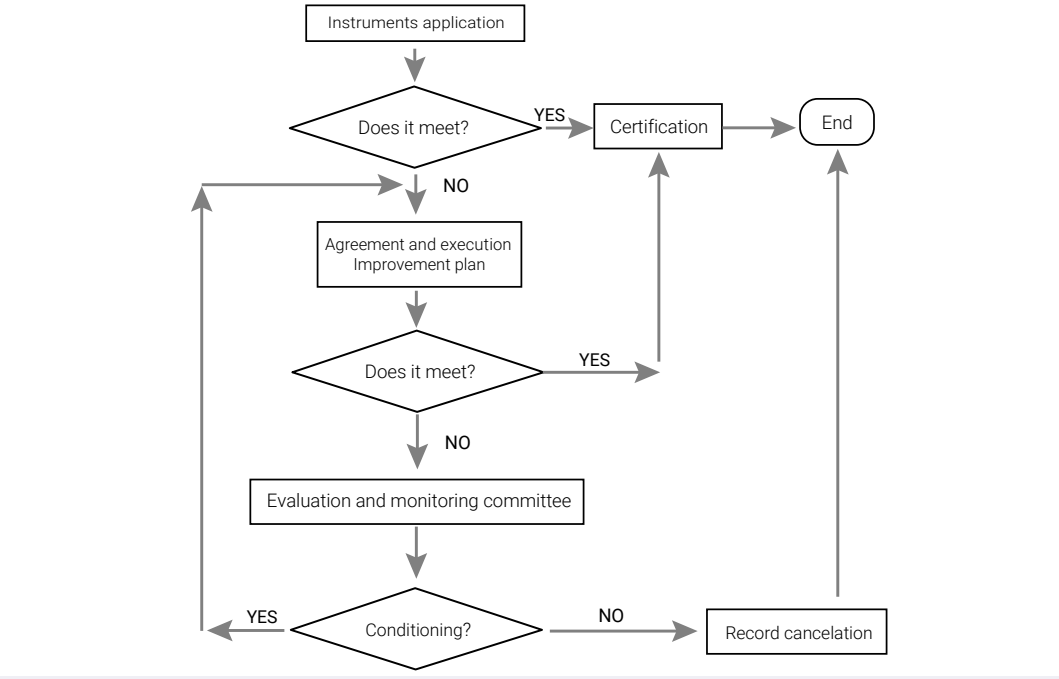
Decision-making, as indicated in Figure 2, involves the judgments issuance, improvement plans with each learner and improvement actions for the training process of other groups, allowing feedback to implement creative actions within the learning outcomes found, stimulating then strengths and neutralize the difficulties that arise.

When the learner does not achieve the expected results, the situation must be analyzed once it constitutes a failure and, as such, is described in the following terms:

> Failures are those actions or omissions that alter the normal training development, the coexistence in the educational community, the academic performance of the Learner or his/her classmates, and which, when they arise, give rise to the need for a punishment and/or educational measure (SENA, 2012, Article 23).

It is important to point out that, due to Sena's nature and, in line with vocational skills training, failures are classified as academic and disciplinary, once not only the technical component is enough, but also the attitudinal component is necessary to guarantee the training integrality and the learner competence; this is why, after applying the instructor's teaching strategies, the learner has the right to develop improvement plans according to the procedure described in Figure 3.

Figura 3 - Evaluation steps



Source: Own depiction.

An improvement plan for training:

> It is a measure adopted to define training actions, after exhausting instructor's educational strategies and learner's initiatives... assigns agreed actions between the Learner and the Instructor or the Academic Coordinator, formulated during the training program performance to ensure the achievement of learning outcomes (SENA, 2012, Article 27).

If the combined actions are not satisfied and, aiming at respecting due process, the learner regulation establishes the procedure for the imposing educational measures and/or punishment, whose most severe level is the cancellation of the academic record and whose meaning cannot be understood in a different way, because the learner failed to demonstrate the acquisition of skills and therefore cannot be certified; i.e., he/she does not present the output profile, the learning outcomes in the context proposed by the project and the achievements of the learner in the appointed time for the training.

4. Learner's Integration

As pointed out by Sena's regulation, the learner is the manager of his/her own learning process and is in permanent communication with the instructor, making the evaluation a moment for the procedures review and adequacy, which, from a pedagogical point of view, benefits the integrating elements of learning in real time, from motivation and goal setting to the analysis of achievements and difficulties (FERNÁNDEZ LÓPEZ, 2017).

Around these strategies and integrating learner, instructor and group, the simultaneous use of hetero-evaluation, self-evatuation, and peer evaluation are validated as tools to collect evidence:

- Through hetero-evaluation, the instructor continuously collects evidence of the training process, such as learning styles, responsibilities, autonomy, group integration, mistakes, successes and achievements to establish the learner's corrective and progressive transference of the responsibility of managing his/her learning process.
- Co-evaluation or peer evaluation for training purposes throughout the process, which is accomplished through the advances' presentation and socialization, allowing feedback to the group in two ways, reinforcing in the learners the acceptance of the other, in an environment of tolerance and constructive criticism (MORENO OLIVOS, 2016).
- With self-evaluation, learner can, in a unique, critical and conscious way, review his/her successes and failures based on knowledge and recognition of concepts, principles and performance validation of his/her learning and that will be the support in a world where skills change with the use of technology and specific performance conditions.

Learning is an active, permanent, continuous and individual process demonstrating the methodology, the learner's progress, the learning environment and the different participants, in which hetero-evaluation, self-evaluation and co-evaluation are activities composing the didactic structure for preparing the learner as the central axis of his/her own learning process (FERNÁNDEZ LÓPEZ, 2017).

5. Final considerations

The backbone of the teaching/learning processes at Sena's training is the learner, and that is why it is committed to the promotion of an evaluation system for skills realization under the strategy of project-based training, in which the very training dynamics allows the knowledge construction.

Evaluation, as an integral part of the teaching/learning process in project-based training at Sena, is an essential activity of the instructors' pedagogical action, who value in the process all the elements inherent in learning, integrating technical

knowledge with learner behavior, to fulfill a transforming function, which allows him/her to play its active role in the knowledge construction and in the skills acquisition.

It should be a process that leads to an ongoing reflection on what has been said, the review of the instructor's profile, his/her pedagogical skills, the understanding of the training model, the project-based training strategy and its capacity and creativity to reach the training objective: being the mediator who favors learning about teaching, for learners to have the initiative and autonomy to develop their lifelong skills, under the premise of learning to learn, learning to do, and learning to be, as integral subjects conquering self-realization and contribute to the social, economic and technological development claimed by the country, which is precisely the Sena's mission as an entity of integral vocational education and free of state character.

Note

[1] This article has the accompaniment of the National School of Instructors "Rodolfo Martinez Tono", from the Directorate of Training of the National Training Service (Sena) of Colombia.

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