

IDENTIFICATION OF THE INITIAL LEVEL OF STUDENTS IN THE COMPETENCE "INNOVATION, CREATIVITY AND ENTREPRENEURSHIP"

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Abstract

It is difficult to identify the initial level of our students in transversal competences. It is necessary to identify the level of departure of each student in the competence in order to offering each student the set of activities that best facilitate the advance in this competence. A set of test/activities has been proposals to evaluate the initial level in Creativity, Innovation and Entrepreneurship competence. The test/activities that have been proposals for the competence allows the teachers to identify the different level of our students in an easy, early, fast and individual way.

Keywords: Innovation, Creativity, Entrepreneurship, Skill, Test.

1 INTRODUCTION

The student's skills to innovate, be creative and be entrepreneur are, in most cases, unknown to the teacher when he/she begins his/her teaching activity with a new group of students. In general, the initial level of a student in non-transversal competences (maths, physic...) can be known by the structure of the curricula previously studied. However, for transversal competences, this starting level is not easy to identify.

The proposal for the identification of the initial level of the students, as well as the difficulties and criteria followed for their development is presented here. The purpose is not to have a learning tool for the student, but rather as a tool for measuring the initial level of the student's competence.

2 OBJECTIVE

The general objective consists of identifying the students according to different levels in the competence "creativity, innovation and entrepreneurship", with the aim of defining different roadmaps that allow to improve their properly achievement of this competence.

3 METHODOLOGY

The project has been structured with the following set of tasks:

3.1 Designing a scale to identify levels of achievement of the competence

The scale design is a complex process that depends on the approach of the teacher (as designer of the scale) concerning the analysis of the transversal competence and on the nature of the competence itself. For example, the transversal competence "Lifelong Learning" has very different dimensions from the competence "Effective Communication", both because of the intrinsic characteristics of the competences and because of the subjective concerns of the teacher when defining dimensions and indicators.

In the case of the UPV transversal competence "Innovation, Creativity and Entrepreneurship" [1] the competence is approached as a process. Specifically, taking the descriptors of the definitions of innovation, creativity and entrepreneurship competence is defined as a process to be followed, it contains the following steps [2] :

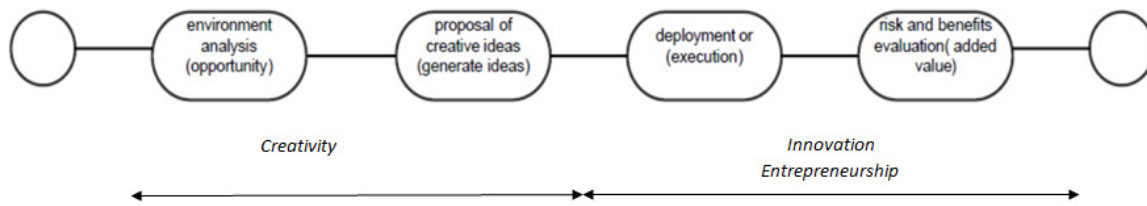


Figure 1. Process related to the competence of Innovation, Creativity and Entrepreneurship [2].

Four scenarios were analyzed for the design of the scale. The different categories on the scale from X to Y were still not established. (eg from 0 to 10, from 1 to 5, ...)

- 1 Evaluation of the competence (as a whole)
- 2 Independent evaluation for Creativity, Innovation and Entrepreneurship
- 3 Independent evaluation of X to Y individually for each element of the process (opportunity, generate ideas, execution, added value)

The global assessment of the competence as a whole was chosen following the scale defined in the rubric of our university. The main advantages were that it is not complex, and it is a well-known scale for the lecturers in our university.

Table 1. Operationalization of the competence of Innovation, Creativity and Entrepreneurship.

Variable	Dimension	Indicator	Item
Transversal Competence of Innovation, Creativity and Entrepreneurship	Environmental analysis (opportunities)	The student questions reality.	Categories: D. Not achieved C. Under development B. Good / suitable A. Excellent / exemplary
	Proposal of creative ideas (generate ideas)	The student contributes ideas.	
	Implementation (execution)	The student formally shapes the ideas.	
	Risk and benefit assessment (added value)	The student identifies results.	

3.2 Designing initial activities to pre-assessment creativity, innovation and entrepreneurship competences for each student

The design of an activity or activities for early identification of the student's level in the transversal competence "creativity, innovation and entrepreneurship" is a challenge due to the complexity of the competence, including related elements that can be addressed independently.

The deployment of the activity in the classroom also determines the design of the activity. Thus, we have considered:

- 1 Early identification. From a temporary point of view, the activity must be carried out in the first sessions of the subject. Thus, the teacher can react and act according to the results.
- 2 Duration of activity. The activity must not eliminate contents in the subject. Thus, the duration of the activity must be brief to modify minimally the planned teaching.
- 3 Identification of the students. From an individual or group perspective, the activity must be done individually. In this way, it is possible to know the results individually to be able to offer personalized proposals for each student.

Thus, the final design of the proposal carries out the evaluation based on different tests / activities for each component of the competence:

A. Creativity: The Torrance Test [3] is widely used to evaluate creativity. Specifically, the task of circles and the divergent production of verbal type have been included to identify originality, elaboration, fluency and flexibility of ideas.

B. Innovation: The "General Innovation Skills Aptitude Test 2.0" [4]. The four pillars on which this test is based (Idea Generating Skills, Risk-Taking Skills, Relationship-Building Skills and Skills to transform ideas into products, processes or services) have been considered. The test includes a double analysis: 1) Students have to evaluate the skills that a professional in their field must have and, 2) Students have to evaluate their own current skills. The designed test evaluates 16 aspects (8 regarding the profession and 8 about themselves).

C. Entrepreneurship: "Test to assess entrepreneurial capacity" [5]. The test evaluates different elements of the entrepreneurial profile using 40 multiple choice questions. In this case, 10 questions that have been considered relevant to evaluate the level have been selected.

Thus, the activity / test designed meets the initial requirements:

- 1 Early identification. It does not require prior preparation.
- 2 Duration of the activity: It has a duration of less than 10 minutes so as not to overload.
- 3 Identification of the students: It is done individually to know the concrete level of each student.

It is important to keep in mind that the purpose of the activity is not to serve as a learning tool for the student, but to be useful as a tool for measuring the initial level of competence in the student.

As a result of the previous evaluation, we can identify the level of each student in the transversal competition. This allows the grouping of students by levels to be able to act in a particular way depending on the level in the competence. An example can be seen in more detail in the following graph where you work with a group of 50 students and a scale from A to D is used with respect to the initial level of the student in the competence. Each point represents a student:

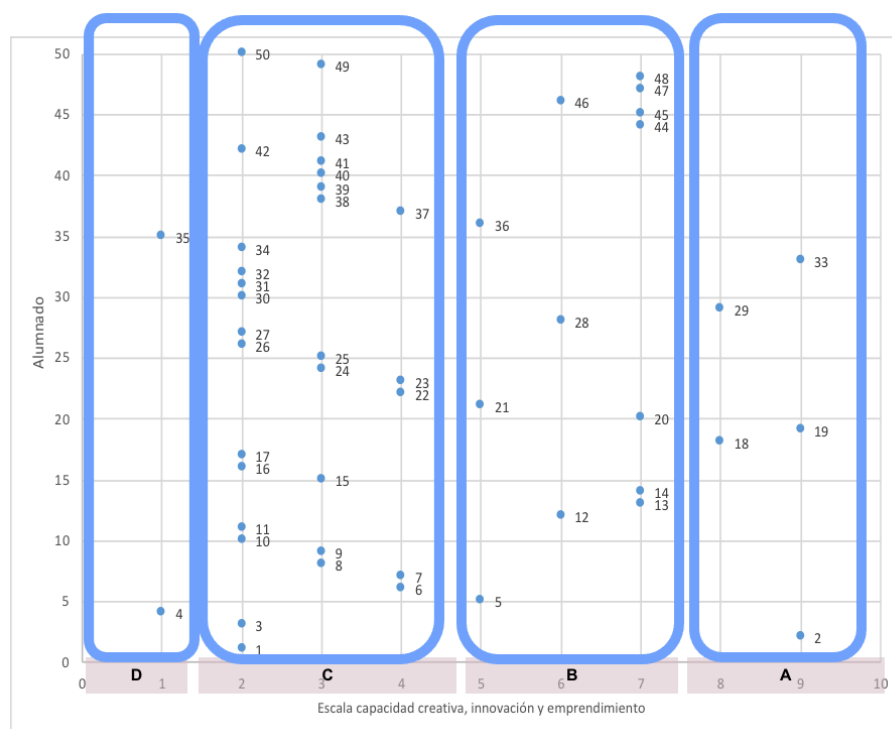


Figure 2. Level of the competence for each student.

3.3 Validation

The validation carried out consisted in a pilot evaluation of the activity designed to identify the initial level of the students. The pilot has been completed in two subjects obtaining answers from more than 100 students. For the treatment of the information a form was used in Google Forms where the students connected by computer or mobile. This pilot has allowed to introduce improvements in the initial proposed design.

4 CONCLUSIONS

The problem of approaching the particular needs of each student at the time of facing and developing the competence "creativity, innovation and entrepreneurship" has been addressed through the early identification of the student's level in the transversal competence.

The stages addressed for this purpose i) designing a scale to identify levels of achievement of the competence, and ii) assessing the initial level of each student in the transversal competence allow adapt the teaching-learning process to the different levels found in our classroom.

The early identification of the student's level in the transversal competence enables:

- To have a broad vision of the students in our classroom about the starting point at the competence.
- To identify clusters of students at the same level regarding the competence.
- To adapt the teaching-learning process according with these clusters.

The test/activities that have been proposals for Creativity, Innovation and Entrepreneurship allows the teachers to identify the different level of our students in an easy, early, fast and individual way.

Thus, this proposal incorporates the student as a key element in the teaching-learning process.

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