EXTENSION OF THE "6-3-5 TECHNIQUE" FOR INCORPORATING CREATIVITY, INNOVATION AND ENTREPRENEURSHIP COMPETENCES IN HIGHER EDUCATION

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Abstract

This article present the extended technique 6-3-5 for generating ideas. It has been called extended because it has been expanded to include issues related to innovation and entrepreneurship. In that way it can be applied to learning transversal competence of creativity, innovation and entrepreneurship. This competence correspond to one of the transversal competences identified by the Universitat Politècnica de València.

Keywords: Creativity, Innovation, Entrepreneurship, 6-3-5.

1 INTRODUCTION

Innovation, creativity and entrepreneurship deals with the mindsets and skills associated with creativity and innovation as well as the qualities and practices associated with successful entrepreneurship. It is necessary to consider how to apply these mindsets and skills in the organization/business [1].

Innovation has been a topic of considerable interest in the education sector for some time. Indeed, successful innovation depends upon the human creativity, knowledge, skills and talents that are fostered and developed, in large part, through education [2]. Innovation is becoming a requirement for competitive advantage in organizations. Therefore, it is an increasingly demanding and important aspect. Promoting the acquisition of innovation competence is one of the aspects to be solved [3]. Innovation has a special value for the survival and development of organizations, especially in a changing context. Developing innovation, creativity and entrepreneurship capacities in students enhances their skills.

Innovation, creativity and entrepreneurship is a complex know-how to be developed in higher education. This complex know-how must be specified in the design of new curriculums through the set of specific and transversal competencies that students should develop [4]:

- Specific competences belong to a specific area of knowledge (in a degree or master) and they are aimed at achieving a specific graduate profile.

- Transversal competences (also named generic competencies and transferable competencies) are generic and transferable in a wide variety of personal, social, academic and professional contexts throughout life. Therefore, they contribute to a fundamental part of the professional profile and educational profile in all the degrees. These competences include a set of cognitive and metacognitive skills, and, attitudinal and instrumental knowledge, which has a great value to the knowledge society.

Creativity, innovation and entrepreneurship correspond to a transversal competence.

2 PROBLEM IDENTIFICATION

In order to try to help the students to improve their skills in such competence different activities have been developed along years.

The most used activity is brainstorming (gathering a list of ideas spontaneously contributed by its members), but sometimes, specific barriers to creativity related to judgment (strong fear of failure in front of others; fear of a new idea is often manifested as criticism and sometimes harsh judgment, they think that no one will like the idea, or they are afraid of ridicule or the implications of possible failure), make difficult to develop these activities in the classroom.

In this sense Method 635 is a specific form of brainwriting [5]. It aims solving brainstorming problems like a creativity barriers as consequence of interpersonal conflicts or cultural status differences existing among the group members [6].

This activity is specifically oriented to improve creativity and ideas generation. However to tackle the whole competence, creativity, innovation and entrepreneurship is necessary to extend the method.

This paper presents the 6-3-5 extended method. The initial method has been extended in order to incorporate some key aspects related to innovation and creativity competences with the objective of being useful to assess the transversal competence of creativity, innovation and entrepreneurship. This is one of the competences identified by the Universitat Politècnica de València to be incorporated into curricula of students.

3   PROPOSAL METHOD

Extended 6-3-5 cover the following steps:

3.1   Select the problem and generate ideas

The first action to be done is to select the problem or innovation to be tackled, where they have to propose creativity ideas to solve it.

After that, the basic procedure underlying Method 635 is that **six** people develop and write down **three** ideas within a defined timeframe of **five** minutes before passing their ideas to the neighbor.

In the next step each team member has to evolve ideas based on the ones given through her/his predecessor. This can happen by modification of existing ideas or developing even new ideas inspired by the given ones.

This procedure is continued until each team member receives his initial sheet of ideas, which should happen after five rounds considering 6 participants.

This step is developed by groups along 30 minutes.

Suggestions: In this step is important to support the student in the process of generating ideas. Mental blocks must be removed. They need to seek opportunities, challenge assumptions, and think creatively.

3.2   Individual Ideas selection

This step is individually developed along 15 minutes. Each student has a sheet with 18 ideas. These ideas are individually reviewed and five ideas are selected for each student according to different criteria.

Suggestions: In this step is important to guide the students in the criteria to be used to select the ideas. Different criteria can be applied, such as: the most original idea, the lower risk involved, the most urgent, the one that brings more benefit, the one that brings the most value (economic, trademark, etc.).

3.3   Team Ideas selection

The six students of each group share their proposal of ideas selected and they reach an agreement and select top five ideas.

Suggestions: At this point is necessary to guide the students in two aspects: 1) communication and 2) agreement.

Communication refers to work successfully in a small group. Students need to be able to communicate clearly on different levels, they need to explain their own ideas, express their feelings in an open but non-intimidating way, listen carefully to others, and ask questions to clarify their doubts.

Agreement refers to select ideas/solutions to feasible options.

3.4 Action Plan

Finally based on the criteria defined by each group, one of the ideas will be implemented, so the group proposes an action plan for implementing the selected idea.

Suggestions: At this point students can propose different aspects related to the process of planning, design, engineering, prototyping, and testing the results to be obtained, sometimes can include manufacturing, distribution, branding, marketing, and sales.

3.5 Value analysis

It indicates the value of the proposed innovation.

Suggestions: To balance the innovation students need a clear picture of how their proposals face risk and offer added value. They can use different tools, such as: risk matrix and R-W-W.

Risk Matrix: The risk matrix employs a scoring system and calibration of risk to help estimate the probability of success or failure for each innovation based on how big a stretch it is for the target audience of the innovation. An innovation's position on the matrix is determined by its score on a range of factors.

R-W-W (real-win-worth it): The Real-Win-Worth screen is a tool to use in the early stages of the innovation process to test the viability of ideas for new products or services. It is also useful at stage gates throughout the development process to confirm the value of the innovation project or to support its termination. At its highest level, the R-W-W screen consists of six fundamental questions: Is the market real? Is the product real? Can the product be competitive? Can our company be competitive? Will the product be profitable at an acceptable risk level? Does launching the product make strategic sense?

Our proposal is not only center into de product development, so the R-W-W must be adapted to any innovation idea, not only product, but also process, organization structures, etc.

Figure 1 R-W-W questions adapted.

3.6 Debate

Pooling and sharing main ideas and difficulties encountered among all the groups.

Suggestions: This is an important part of the method where the students have the opportunity of sharing their proposals, so it is important to take into account that the lecturer have to let others do the talking, hold them accountable for listening and let them help each other listen, with the objective of having and active listening among the students.

Table 1 635 and Extended 635 steps. Rationale and Relationships.

Description	Competence tackled	Technique	
Problem Identification	Seeking opportunities, Creativity	6-3-5	Extended 6-3-5
Generate Ideas	Ideas Generation, Creativity	6-3-5	Extended 6-3-5
Individual Idea selection	Critical Thinking		Extended 6-3-5
Team Idea selection	Critical Thinking, Team Work		Extended 6-3-5
Action Plan	Entrepreneurship		Extended 6-3-5
Value analysis	Innovation		Extended 6-3-5
Debate	Team Work, Effective Communication		Extended 6-3-5

4   CONCLUSIONS

This paper proposes a method of complementing the given Method 635 by means of further steps in order to incorporate innovation and entrepreneurship in the activity to be develop.

Through the application of the proposed method, the students are surprised by their ability to raise new ideas, at first they doubted to complete all rounds. The debate comes at the end of the activity is as important as the process.

This activity not only pay attention to the generation of ideas, but also in the implementation and analysis value of these ideas, thus cover the transversal competence of creativity, innovation and entrepreneurship.

Some advantages drawbacks have been identified:

Advantages: it is easy to understand and use, the innovative potential of the group grows, all participants remain active and involved (which does not happen in a brainstorming session), premature discussions are avoided (may have a negative effect on the group), any useful idea is systematically developed later, and the author of the idea can be identified.

Drawbacks: some participants may have problems describing their ideas concisely (so the idea maybe is not clear to others participants), some participants may feel pressured by the deadline of 5 minutes.

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