



# Fostering **creativity** and **creative thinking** as an innovation in higher education

## Fomento de creatividad y pensamiento creativo como innovación de la educación superior

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### Abstract

The promotion of capacities and skills in higher education alludes to transversal competencies associated with educational innovation in relation to improvement and commitment to it, which is recognized, in turn, as a process of change. Specifically, creativity and the characteristics of creative thinking such as originality, flexibility, fluency, and elaboration are based on the theory of divergent thinking. From the perspective of Murillo & Krichesky's (2012) model of educational innovation—with the phases of initiation, planning, implementation, planning and institutionalization—the objective of this text is to analyze how creativity and creative thinking have been promoted in order to observe to what extent these transversal competencies are being developed in higher education, which can contribute to studies in creative areas such as design. As a method, the documentary analysis technique was used to compile, analyze, and categorize research on the development of skills and abilities in higher education. Finally, the findings demonstrate problems in the development of these skills and the scarcity of innovation proposals or cases of successful institutionalization, highlighting the relevance of carrying out actions that promote these competencies in higher education.

**Keywords:** creativity, higher education, educational innovation

### Resumen

El fomento de capacidades y habilidades en la educación superior alude a competencias transversales asociadas a la innovación educativa en relación con la mejora y el compromiso por ésta, la cual es reconocida, a su vez, como un proceso de cambio. Específicamente, la creatividad y las características del pensamiento creativo como originalidad, flexibilidad, fluidez y elaboración tienen como referente la teoría del pensamiento divergente. Desde la perspectiva del modelo de innovación educativa de Murillo y Krichesky (2012)—con las fases de iniciación, planificación, implementación, planeación e institucionalización—, el objetivo de este texto es analizar cómo ha sido el impulso de la creatividad y el pensamiento creativo para observar hasta qué punto se vienen desarrollando estas competencias transversales en educación superior, lo cual pueda contribuir en los estudios de áreas creativas como el diseño. Como método se sigue la técnica de análisis documental dirigido a recopilar, analizar y categorizar las investigaciones sobre el desarrollo de capacidades y habilidades en la educación superior. Finalmente, los hallazgos manifiestan la expresión de problemas en el desarrollo de estas habilidades y la escasa cantidad de propuestas de innovación o casos de institucionalización exitosos, destacando la relevancia de realizar acciones que impulsen dichas competencias en educación superior.

**Palabras clave:** creatividad, educación superior, innovación educativa

## ◆ Introduction

Directing educational innovation actions that promote the development of creativity and creative thinking in higher education leads to the detection of a latent problem in the teaching-learning process. Attempting to train capable professionals in technological and creative matters, with knowledge in action and concepts such as generation of ideas and originality, takes second place because they are considered transversal competencies whose impulse is left to the teacher. Actions to strengthen thinking skills are linked to teaching strategies that confront capabilities and promote flexible projects, signifying a process of change.

Regarding the orientation of the improvement of higher education, the United Nations Educational, Scientific and Cultural Organization (Unesco, 2021) and the Organization for Economic Cooperation and Development (OECD, 2017) expose the need to seek new strategies for the training of professionals, ensuring that curricula have to be linked to labor demand. Although the teaching of the use of technology has been taken up as an important guide, it is recognized that thinking skills are linked to an implementation that requires being independent of these environments and having a balance with the resources used.

In addition to the ongoing transformations, the pandemic situation (COVID-19) has caused many businesses and jobs to disappear. Despite this, new employment opportunities are expected to develop based on technology, analytical and problem-solving skills. In this scenario, creative areas, such as design, have certain advantages, as remote work has become a common way to practice them. In this sense, higher education has seen the need to promote programs or actions that promote thinking skills, whose value is found in ideas or solutions presented (World Bank, 2021; Economic Commission for Latin America and the Caribbean [ECLAC], 2020). Thus, encouraging the development of transversal competencies as a process of change is the starting point of this work.

In this regard, it is noteworthy that several researches on transversal competencies (De Freitas & Almendra, 2021; Pilar & González, 2018) agree about the relevance of developing capacities and skills of idea

generation, decision making and thinking adequacy for different actions, considering that the use of technology or methodologies have been taught from different subjects, due to the fact that transversal competencies do not have one of their own.

Thus, the actions that orient these competencies to creativity and creative thinking have been taken up again as a challenge in the face of constant changes and the need to adapt to the use of technology. Regarding strategies to strengthen creative thinking, the relevance of using mind maps as a solution to complex problems (presented by the teacher) that form a dialogue with the student and challenge him/her to generate original ideas is highlighted (Borodina, Sibgatullina & Gizatullina, 2019; Delgado, 2022).

Then, the development of transversal competencies in higher education has been strictly linked to the teacher or the student's innate abilities. However, other complements, such as feedback or peer collaboration, are also assimilated as ways of applying creativity or creative thinking, as they allow the development of a greater number of ideas, as occurs in the case of design. The process of change involves understanding theory and practice to base new proposals, developing an innovation process that behaves in a non-linear way. However, in the creative areas this is something that is lacking both in training and in professional practice, where intuition and creativity are chosen in advance before the substantiation of ideas and concepts supported by design methods in accordance with the reality and needs of the environment in which we live.

In accordance with the proposed objectives, educational innovation proposes to improve and consolidate changes. Thus, in the development of transversal competencies in higher education, there must be a clear justification that responds to certain needs and conditions of practicality and feasibility (Fernandez & Alcaraz, 2016; Zabalza, 2004). After specifying a series of stages, institutionalizing innovation implies commitment to it, although this is the most complicated thing to achieve.

When comparing innovation with a change process (Fullan, 2002), objectives are determined in terms of the improvement to be implemented. Noting that an innovation process is not linear but involves stages that can be adjusted to the needs of education, Murillo & Krichesky (2012) derive a five-phase model: the first stage, initiation, is a trigger for the process that focuses on the commitment of the people involved to reach an agreement. In the same stage is the diagnosis, with which demands are established and data are systematically collected, focusing on dimensions of development, quality, and adequacy (see Figure 1).

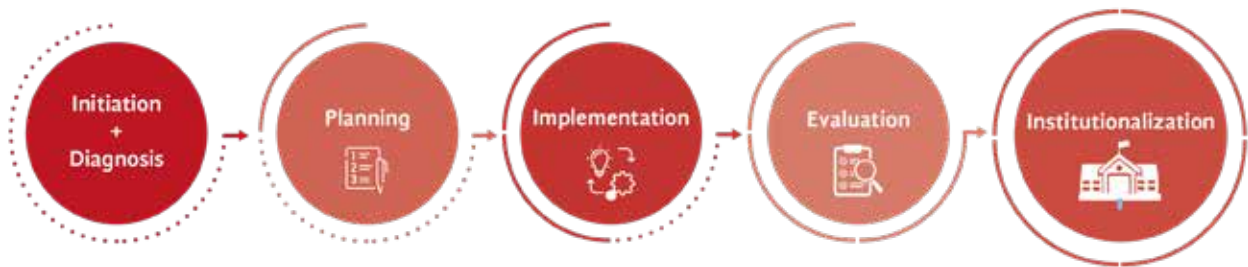


Figure 1. Phases and subclassifications of the model.

Source: Own elaboration based on the model of Murillo & Krichesky, 2012.

The second phase is known as planning and deals with well-founded, realistic, and clear proposals capable of setting out activities or strategies for change, with objectives being the main aspect to be addressed. From this stage comes implementation, i.e., the action of developing a program or activities based on objectives, which requires a balance between simplicity, flexibility, and adaptation. This is followed by evaluation, which is based on instruments that recognize the effects of the previous phase (either weaknesses or successes) to propose lines of action. Finally, institutionalization, also known as the culture of improvement, is in line with Zabalza's (2004) idea of commitment to improvement. This phase demands the elimination of tensions, also known as innovation rigidity (Fullan, 2002), and the support of the people involved to avoid setbacks.

The process of change that involves the development of transversal competencies in higher education seeks to improve the relationship between the university and the environment, in addition to promoting the student's capabilities and skills. Divided these between generic (oriented to all disciplines) and specific (focused only on one field), creativity and creative thinking stand out for the adequacy of teaching-learning, where the rapid detection of problems and the proposal of solutions are promoted (Palos, 1998; Tejeda, 2016).

From the theory, creativity is understood as the ability to develop things by making use of available resources, and is taken up from the product, the process, and the person (Santamaría & Sánchez, 2012). In this sense, the subject puts into practice flexible thinking to achieve a goal (Gardner, 1993; Shmukler, 1992; Yentzen, 2003). Although creativity is sometimes assumed to be an innate gift of the subject, in reality, multiple studies affirm that it can be triggered with strategies.

Creative thinking, on the other hand, is the ability to propose original results and its value is found in the result it produces for its objective (De Bono, 1999), it is linked to thinking and behaving creatively and with the combinations of ideas it can generate. From the theory of the Structure of Intellect of Guilford (1967), divergent production is linked to producing logical alternatives by means of the information obtained, where characteristics of originality, fluidity (quantity),

flexibility (adaptability) and elaboration (refinement) are distinguished (Guilford, 1967; Romo, 1987).

The fact that creative thinking tends to be related to creativity has caused confusion between concepts; the difference between them lies in the fact that the former has its value in the ideas, while the latter in the product achieved. In the field of creative areas, such as design, creativity and creative thinking tend to be considered equivalent; however, to develop from one or the other interstice leads to think, plan, create and solve problems on dissimilar scales, which impacts the nowadays so valued "innovation" in professional practice.

Due to the relevance of fostering capacities and skills, the purpose of this text is to determine how creativity and creative thinking have been promoted in higher education according to the stages of the change process, from an educational innovation perspective. This, according to González & Cruzat (2019), entails elements that seek to contribute towards a justified change or improvement, which is now emerging as a solution in the face of the constant evolution of society. When creativity is taken up again, the purpose of innovation is aimed at producing knowledge based on solving problems and formulating new objectives according to contexts and situations (Elisondo, 2015).

**Method** This is a study that follows a documentary methodology, which entails using data or information collected through existing research, whereby different types of articles are collected, consulted, and analyzed in an orderly manner to obtain the results (Cozby, 2005; Pimienta & De la Orden, 2017).

The purpose of this interpretive paradigm methodology is to relate data obtained from different sources to provide a systematic view. In this way, academic production related to creativity and creative thinking was identified, considering diverse scientific sources without applying restrictions with respect to journal types. The delimitation criteria were based on selecting research from the year 2014. National and international databases strictly related to higher education in Spanish and English were consulted.

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In correspondence with the first phase of the model, the subclassification is placed: identification of the problem and diagnosis, for which research (both documentary and methodological) that clearly indicated the need for innovation in terms of creativity and the creative were taken up. Following this, for the phase of objectives or proposals, studies were taken up where these were clearly stated. In the actions and programs stage, articles were taken up where models or activities were implemented to encourage innovation.

For the evaluation phase, we sought to identify research that compared and analyzed the viability of an established program (although not necessarily consolidated) without considering whether it had been positive or negative. Finally, in the institutionalization stage, established as a culture of improvement in the model, the idea of consolidation of change was taken up again, since no article had the term referred to here. The characteristics of each subclassification are shown in the following table:

Table 1. Phases and sub-classifications of the change process

Phase of the change process of change	Subclassification	Subject of analysis
<b>Initiation</b>	Identification of the problem or diagnosis	Research indicating a problem or need in terms of competencies and skills in higher education
<b>Planning</b>	Objectives and proposals	Documents with phases, stages, or objectives on the enhancement of creative thinking and creativity in higher education
<b>Implementation</b>	Actions for change	Articles where a specific methodology for developing an innovation project is implemented
<b>Evaluation</b>	Indicators, questionnaires, comparisons	Analysis of programs for the improvement of competences and skills that have already been implemented in higher education
<b>Institutionalization</b>	Consolidation of change	Studies on consolidated innovations in higher education

Source: Adapted from the model of Murillo & Krichesky, 2012.



Thus, a total of 56 articles were analyzed and distributed according to the phases of the Murillo & Krichesky (2012) model (see Table 2):

Table 2. Percentages and characteristics of the articles reviewed.

Phase of the model	Percentage of articles	Number of articles	Characteristics
Initiation	29%	16	Documentary review articles where diagnoses are made on the lack of innovation in higher education, but without proposing improvements
Planning	16%	9	Curricular development plans, subjects or proposals for innovation that have not been implemented
Implementation	21%	12	Studies on programs, workshops or subjects that have been tested or have been in operation for less than two years
Evaluation	20%	11	Methodological analysis and research on the results of programs or innovation proposals
Institutionalization	14%	8	Innovations (subjects) successfully implemented in higher education institutions

Source: Own elaboration.

**Results** *Initiation: Detection of the problem to consider improvement.*

The results allow recognizing that initiating a process of change focused on creativity or creative thinking has been taken up as a transversal aspect; the relevance of encouraging the teaching of these capacities and skills is identified, due to the constant transformations faced by the people involved in education and the need to train professionals capable of generating ideas and adapting them to any environment (physical or temporal). From the theoretical point of view, this is related to Guilford's (1967) contributions on elements such as originality, flexibility, fluency, and elaboration. These aspects are highly demanded and demanded in the designer, who has the responsibility to provide innovative and even disruptive products that act as real solutions to problems in a highly

competitive environment. Therefore, the quality of teaching-learning becomes a central point. In this sense, the problem begins when there is a gap between what is taught in the curriculum and what is necessary to put these characteristics into practice.

Specifically, in the subcategory of problem detection, it has been pointed out that disciplines such as design, which are directly related to these competencies, lack a focus for their development, despite having specialized subjects for this. Thus, the absence of generation of original ideas and the tendency to limit themselves to ambiguities is identified (Logbo, 2017; Medina, 2018; Vázquez & Ruão, 2021). This has also been related to teaching, considered routine or repetitive, lacking an approach that encourages creativity and creative thinking. In addition to the situation of confinement due to the pandemic caused by COVID-19, the development of capacities and skills has taken a back seat to the adaptability to the situation, since it occupies a minimal curricular space in teaching. The problem begins when there is a lack of focus regarding techniques or strategies to implement an innovation perspective that transcends the classroom, which demands strengthening mental processes in training.

Here the diagnosis and actions that allow prioritizing areas with needs, collecting data in a systematic way or proposing ideas for change stand out. Thus, it was detected that the promotion of creativity and creative thinking involves a theoretical-practical relationship and a commitment on the part of the teacher to stimulate its development. For this reason, activities are proposed that encourage flexibility of thought, a climate that reinforces established ideas and specific times for each action.

The development of creative thinking requires actions according to emerging needs and associates its teaching with the capacity of each subject, without depending entirely on means or tools (Abarca & Márquez, 2019; Ramírez & Rincón, 2019; Zambrano, 2019). Innovation with respect to these capabilities and skills involves increasing interactions between environments and subjects, taking risks, and investing in generating constructive processes (Elisondo, 2015), enhancing interest in those involved and creating new experiences to generate proposals for change, making use of available resources.

The diagnosis, when related to the identification of the problem, responds to the absence of a clear approach to transversal competencies in higher education. Thus, the process of devising proposals for improvement begins, which considers tools, such as technology, to awaken capacities and skills without depending on external factors or situations that lead to the loss of originality of thought.

In the initiation phase, problems are identified in terms of creativity and creative thinking, which are associated with low innovative strategies or low levels of creativity (recognized through tests such as the Torrence



test to measure fluency, flexibility, originality and elaboration with figurative and verbal tests), as well as with a low ability to develop original or flexible ideas, all of which would mean a major problem for those who are about to graduate from university. While in the diagnostic phase, the problem is also given by the repetition of techniques in some disciplines, which would imply a retrospective in the process of change.

### ***Planning: Clear objectives and proposals***

Planning (Murillo & Krichesky, 2012) consists of defining steps for change, clarifying objectives and characteristics. It also must be grounded, participatory and realistic, in addition to specifying strategies, defining priorities, ordering actions and modes of evaluation. This is related to the perspective of Zabalza (2004), who explains how innovation must be complemented without improvisation, incorporating new knowledge and resources. When identifying objectives, a problem or absence must be recognized. Regarding the development of creativity and creative thinking, these are clear: a) to justify the relevance of transversal competencies and b) to direct innovation to boost capacities and skills. However, there is a deficit of proposals for improvement, since most of the literature is limited to identifying a problem without proposing a solution.

In the same vein, regarding teaching and learning in the areas of design, both the curriculum and the vision of the programs are still attached to the Bauhaus model, which, a century later, as Lupton & Miller (2002) point out, is still in force in university education in the different branches of design. This allows us to elucidate why a structure far from a transversal training is maintained, since it tries to promote innovation, but continues to be attached, to a greater extent, to innate creativity rather than to the building of logical-cognitive abilities and skills proper to creative thinking.

From the subclassification of objectives, aspects are taken up again to generate a change, promoting the development of critical and reflective thinking to complement creative thinking, with the support of activities and resorting to models, programs, or strategies to stimulate learning, without assimilating them as a burden to established schedules.

By creating a model that boosts these skills, the main objective is pursued of awakening the ability to generate ideas under characteristics of originality and flexibility, as well as that of communicating, redirecting, and implementing them, valuing the identification of the problem and the elaboration of thought (Carvalho, Fleith, & Almeida, 2021; Jiménez, 2019; Marko, Pikabea, Altuna, Eizagirre, & Perez, 2019). The definition of objectives makes it possible to be aware of the transversal competencies in higher education to, in this way, create a coherent proposal that is viable.

Proposals for innovations focused on these transversal competencies involve considering the environment (physical or temporal), institutional guidelines and personal representations, those involved in the process and didactic elements such as curriculum, study plans or methodologies. Therefore, it is relevant to adhere creativity to the curriculum and the graduate profile, through the following objectives: include specific subjects and tests to evaluate the progress achieved, train the teacher, and make use of technology to awaken competence and incorporate specialized classrooms (Navarro, 2020; Summo, Voisin & Téllez, 2016).

Unfortunately, only two researches were detected that unite objectives and innovation proposal, clarifying the absence of actions in favor of innovation. The first is Moreno (2014), who develops a proposal to foster creative thinking from areas such as design and technology, seeking to create a process that drives thinking skills in the discipline. It is developed in stages that involve the student (identification and research of the problem) in the creation of solution proposals and the teacher, on his side, in the support and feedback. Both would act in the construction of the prototype, testing and evaluation, communication and redesign or finalization. The purpose of these phases is to develop originality, flexibility, fluency and elaboration of thought, without neglecting aspects such as the tools used, or the method followed.

The second is Wu, Siswanto, Suyanto, Sampurno and Tan (2018), who propose the Creative Thinking Curriculum Infusion (CTCI) under the following objectives: understanding of the skill, definition of contents and functions, advantages of it in the labor field, development strategies, processes, and characteristics, as well as its relationship with creativity. In addition, they are committed to give courses on theories, strategies and teaching how to implement creativity and creative thinking both in the career and in daily life, taking up methods such as problem solving, use of digital tools and evaluation under the Torrance Test of Creative Thinking (TTCT).

The proposals identified are oriented to both the teacher and the student and give responsibility to both parties. In the case of teaching, constant training, well-equipped spaces, an open mind, and clear knowledge are proposed. As for learning, on the other hand, commitment and participation in the activities proposed to develop these transversal competencies is expected, not only with the aim of obtaining results, but also to develop something that can be consolidated.

### ***Implementation: Actions for change***

In the implementation phase (Murillo & Krichesky, 2012) ideas are tested and/or activities, models or programs are created to achieve the objectives of the change. This process usually follows a clear methodology and has testing (quantitative methodology) or groups (qualitative methodology) to observe results. The improvement action follows an

objective and a specific proposal that can be considered a test or a first approach to solving the problem. The articles coincide in similar processes by using theories that take up characteristics of creativity and creative thinking, as well as by addressing the subjects involved and suggesting actions at the end of the testing.

Among the actions for change, the implementation of the C-K Theory (C-K Theory) stands out, where "C" refers to concepts and "K" to knowledge in definition to new objects (Hatchuel, Le Masson, & Weil, 2018). The theory takes up the search for ideas, their refinement and structuring, to transform, verify and reorder them. By putting it into practice in university workshops, preliminary data are collected through expert opinions, we proceed to take up results and evaluate curricula (Hatchuel et al., 2018; Suacamram, 2019). Another outstanding action is to apply the CREATE Model (Sakon & Petsangsri, 2021) to create creative products by using technological tools and organizing a systematic teaching process, support, and feedback in each activity, as well as teaching theories and techniques considered creative.

These models have been implemented to boost creativity and creative thinking and have been tested in small groups in comparison with new subjects implemented from the curriculum. This gives the opportunity to identify the strengths or weaknesses of the innovation to refine the model or develop courses of action. By putting theories such as C-K into practice, it is expected to have better results in terms of skills development; however, it is important to highlight the relevance of testing in groups of different disciplines and with a larger number of participants.

Likewise, subjects focused on creativity and creative thinking have been implemented, with the aim of teaching how to develop these transversal competencies, to generate ideas and to understand creative blocks. An example of the methods used is Design Thinking, which has gained presence in the curricula for its reorientation of thinking and its tools to break creative blocks, by empathizing, defining, devising, prototyping, and evaluating a certain product. All the above is done with the aim of directing this thinking towards identifying and solving problems, especially in areas such as design, architecture or engineering (Brown, 2009; Gutiérrez, Torres, Biondi, Sarmiento, & Acuña, 2021; Latorre, Vázquez, Rodríguez, & Liesa, 2020; Martín, 2018).

During the pandemic, Sanz & Montes (2021) implemented a project to boost creativity through technology, as well as capabilities and content sharing in the communication area of a Madrid university. Since it had two phases (creation and result), it was flexible. As a result, word games, creation of texts and poems through association were used to develop a script for an audiovisual piece. In this way, the teacher participated by supervising the stages of the project and giving feedback to his students to obtain a result. This type of project is expected to complement

face-to-face teaching or even become an individual subject, as traditional practices are virtualized.

The implementation phase makes it clear that an attempt has been made to develop educational innovations related to creativity and creative thinking, either as a workshop, methodology or subject, where the teacher acts as a key character in the process. During the implementation of the strategies, it is also possible to recognize slow situations or those that do not come to fruition, since they imply developing a proposal and having a certain commitment; however, in some cases these projects are not approved in the evaluation.

### ***Evaluation: Assessment of educational innovation***

Evaluation (Murillo & Krichesky, 2012) assesses whether the objectives set out in the first phases of the model have been achieved, as well as the procedures and consequent effects. Indicators must be determined, and it must be emphasized that the results may or may not be quantitative. For this reason, different instruments are often used, such as questionnaires, surveys or document analysis, reports or focus groups (in the case of a qualitative study).

When evaluating the actions implemented, the results are not always positive, but this provides an opportunity for improvement. When focusing on creativity and creative thinking, the evaluations are diverse, as they depend on the type of study and the subjects involved, but they take up a program and determine how much influence it had on them. Although examples of implemented actions were found, more evaluations of the current state of capacities and skills in higher education students were detected, all of which remained in the diagnostic phase without developing any proposal.

In the search for methods considered innovative, such as design-based learning or jigsaw cooperative learning, we found results of conformity, since they are related to the development of ideas and the construction of creative thinking. Likewise, a greater approach to problem solving, increased confidence (but not awareness), lack of knowledge of one's own abilities and weaknesses, and a slight favoring of creative thinking were found by highlighting that, although it is possible to trigger it through this strategy, it is only in a minimal way (Perangin, Sinaga & Syahputra, 2019; Rodriguez, 2014).

The development of creativity and creative thinking also involves recognizing the lack of awareness in project development, as teachers request results and/or rapid project development without considering alternatives or creative approaches. The strategies implemented have been limited to models or workshops, from which only ephemeral results have been obtained. In the case of design, the teaching-learning that takes place in the classroom is generally linked to the development of

fictitious projects, with fictitious clients, without a precise strategy or methodology for project development or expected results. This makes it difficult to achieve innovative dynamics and results.

During the pandemic, studies were developed on new forms of teaching and their relationship with the promotion of thinking skills. For example, when evaluating the virtual classroom learning environment (VCLE) in Thailand, which was expected to use digital tools to create ideas, an increase in the development of creative thinking in areas such as engineering, science or mathematics was found (Wannapiroon & Pimdee, 2022). In Spain, on the other hand, similar tools were implemented to provide access to a virtual gallery, building a space that fostered creativity and the union between disciplines of fine arts and communication (Meléndez & Sedeño, 2021), obtaining as a result greater teacher-student collaboration, flexibility in the situation and positive opinions to generate similar proposals.

Thus, the evaluation of workshops and interventions to promote creativity and creative thinking in various programs resulted in an increase in these transversal competencies, by giving greater freedom in decision-making, as well as changes in perspectives and the development of proposals under criteria of originality, flexibility, fluidity, and elaboration. Likewise, by encouraging peer support, efficient results were found in terms of the development of creative thinking, teamwork, and the development of original ideas in different disciplines (Catarino, Vasco, Lopes, Silva, & Morais, 2019; Rodríguez, Pérez, Núñez, Baños, & Carrió, 2019).

The use of technology has also been essential when assessing innovations, since, in changing situations, these transversal competencies have been excluded to adapt to the practicality required by time, needs of teachers and/or students. Therefore, when evaluating, it is also detected that making use of new practices stimulates capacities and skills of those involved in higher education, highlighting aspects such as problem solving or the rapid generation of ideas when developing a project.

***Institutionalization: Consolidating innovation implies more than solutions.***

Institutionalization corresponds to the moment when the improvement is considered something "natural" or completely adapted in its objective (the institution, actions related to teaching and learning, among others). In view of this, it is necessary to investigate whether the subjects involved consider the process effective and the effects it has caused on their practices, which is mostly associated with a commitment (Zabalza, 2004), as opposed to the actions applied that generate setbacks. The commitment for this stage can be considered the most difficult since few proposals have been institutionalized in terms of creativity or creative thinking. The articles reviewed indicate that implementing changes

(such as subjects, programs, or strategies) takes time and that it is relevant to continue investigating new proposals, without allowing innovations to get lost in the routine.

Despite improvement efforts, proposals are not always considered successful and demand reorientation. Chanal (2019) notes that, when implementing a program to develop creativity in a French university, it failed in its early stages, as students opted for other subjects or activities. Understanding this, the program was reoriented to the teacher and gained greater popularity, as innovation became a platform that incentivizes teaching, granting sessions to stimulate skills and bring them to the classroom, which was considered as a bottom-up institutionalization process, i.e., an action that begins at the initiative of the faculty. Cases like this provide an opportunity to recognize the tensions or obstacles to developing creativity and creative thinking in higher education. As in the previous example, different unsuccessful programs went from being almost eliminated to reorienting their objectives, which led to starting the cycle again.

Unlike the previous case, cases of successful institutionalization are found in two Spanish universities: in the first, Creative Thinking subjects were implemented to detonate skills through a flexible process to stimulate the interest of young people to propitiate new ideas (Sivera, 2016). In five years, the results have been considered effective in terms of competencies and skills developed, in addition to the fact that participants showed satisfaction after the course. In the second case, strategies have been detected, such as project-based learning (PBL) or design thinking (Design Thinking), which demonstrate how actions to foster creative thinking have been successfully institutionalized (González, 2014).

For their part, in America, three cases of successful institutionalization were found by Puccio & Lohiser (2020): at Suny Buffalo State, in the United States, and Sheridan College, in Canada, where programs, workshops or courses have been implemented to develop creativity and creative thinking using knowledge about theories, models and methodologies such as Design Thinking, as well as an evaluation and a creative attitude. UNAB, in Colombia, has also successfully implemented a program involving teachers and students who create habits to promote creativity, press to evaluate environments that develop this capacity, carry out projects and take up models to detonate it.

Finally, in the Netherlands, certain universities apply the Brainnovation Six Step Cycle of Creativity (Ritter, Crijns & Biekens, 2020) which, with a duration of two semesters and of a mandatory nature, is adjusted to students with different backgrounds and combines knowledge with practice (for example, connecting ideas with incubation or illumination models). The program is developed in six steps (emphasizing understanding the problem and focusing on the solution) and uses four tools:



simplifying, differentiating, visualizing and labeling the problem, which is assigned by the teacher and demands to be challenging or difficult to answer.

Considering that several programs or subjects have been successfully institutionalized in universities, it is relevant to understand the processes they put into practice to develop an improvement in our universities. In this way, new proposals could be created with greater probability of success in other institutions or disciplines of all areas, since not only those related to art demand a correct use of creativity or creative thinking, but also engineering and other sciences require original and flexible thinking. Although institutionalization takes more time and faces different obstacles, it is also gratifying to recognize that efforts have been made to improve the capacities and skills of teachers and students. Currently, faced with a scenario in which hybrid or virtual modalities have been experienced, the development of transversal competencies demands new approaches to adapt to these challenging environments.

## Discussion

From an educational innovation perspective, programs, courses, workshops, subjects, or methodologies have been proposed to promote creativity and creative thinking in higher education. In the initiation phase, there have been detected absences of practices that detonate capacities and skills in the university, when the latter, following a process of change, demands structural actions that boost teaching strategies and sustain an evaluation (Fullan, 2002) to ensure successful institutionalization.

In the diagnostic stage, on the other hand, low levels of creativity focused on students have been found, which could be due to factors such as giving more value to the product than to the development of ideas, lack of time to develop them, dependence on tools derived from technology, or prioritizing the opinion of third parties instead of developing an original solution (Yentzen, 2003). Far from being negative points, these results provide an opportunity to consider how skills can be encouraged from different environments or situations. Then, the real problem lies in the fact that transversal competencies occupy a minimal curricular space (Tejeda, 2016) compared to other subjects.

This can be verified by scrutinizing the curricula of Design programs both in most Mexican universities and in other countries, where the curriculum and teaching is based on the workshop system; study-learning based, according to Tovey (2015), on doings, that is, on practice, with little interest in research.

The planning stage resorts to raising clear objectives to consider a proposal for change. When researching improvement processes on creativity and creative thinking, an absence of documents or strategies that pro-

pose an innovation was detected, and the few that linked objectives with proposals presented some ambiguity as to the actions to be implemented. These only mentioned that the student should adapt to the actions and have a participative attitude in the programs, while the teacher should be willing to support the development of the project, being a key factor in aspects such as feedback and evaluation, all of which is associated with the definition of roles and functions of those involved in leading an innovation process.

According to the analysis, when implementing change actions, workshops or courses have been used to promote the generation of ideas under the criteria of originality, fluency, flexibility and elaboration proposed by Guilford (1967). These characteristics are also associated with creativity in developing the final product. The implemented programs present coincidences in terms of techniques to awaken capacities and skills using methodologies such as Design Thinking, project-based learning, mind maps and constant feedback.

From the evaluation phase, instruments are used to analyze the results of these actions, where certain programs have shown weaknesses or have been cancelled. When evaluating the workshops or courses proposed to encourage creativity and creative thinking, positive results have been found regarding the development of ideas, problem solving and collaborative work, making this a key to stimulate transversal competencies in higher education.

As for the negative results, there has been resistance on the part of teachers to change their strategies or their lack of knowledge of them, as well as a lack of interest in enrolling in courses that would mean, according to the data, an increase in work. The evaluation rescues and values the results obtained and inspires future projects; in this way, new processes of change have begun in several institutions.

Institutionalization takes up these actions, considered educational innovations by some universities, where success has depended on a commitment (Murillo & Krichesky, 2012; Zabalza, 2004) by considering the dimensions and needs of those involved. These changes, determined by courses or subjects to foster transversal competencies, have to be constantly reviewed, as well as creative practices should be implemented, constructive criticism should be encouraged (Tejeda, 2016) and non-linear processes (which cause rigidity in the thinking of each subject) should be used.

**Conclusions** The study allowed recognizing in the literature the use of few theoretical components regarding creativity and creative thinking, since only contributions from various theories are taken up, among which the structure of the intellect or divergent thinking stand out. This could be considered

a limitation, as well as the small number of innovation proposals or successful cases of institutionalization.

Although research in English and Spanish is taken up, which could be a bias in the search for results, the fact is that it provides the opportunity to find weaknesses in the transversality of the articles identified. As part of future lines of action, it is proposed to describe strategies or innovations implemented during (and after) the pandemic to encourage skills and abilities in the university, to determine how to teach how to develop original and flexible ideas, and to analyze the role of technology in the current state of creativity and creative thinking in the teaching-learning process.

On the other hand, the stages of the change process helped to understand the current state of the promotion of creativity and creative thinking in higher education, where each institution has its own procedure to reach improvements; however, bottom-up innovations were also highlighted, where actions driven by the teacher's initiative become institutionalized based on established objectives and the support of those involved. This action refers not only to putting a strategy, program, or methodology into practice, but also to the commitment to maintain it and follow up on the results obtained.

In the attempt to foster creativity and creative thinking, strategies such as mind maps have been taken up again in some universities, when the cases of institutionalization considered successful developed a complete scheme of programs based on theory and practice to promote the generation of original ideas, whose value lies in the quantity of ideas produced (fluency) and the actions taken to perfect them and bring them to completion (elaboration).

Regarding creative areas, such as design, there is little openness to move away from the traditional models that have governed teaching-learning since the first design schools in Europe, relying on curricula that promote creativity over aspects such as research, complex analysis in project development, diligent use of design methods, among other aspects, as well as little interest in training the teaching staff. In addition, the faculty seems to choose to maintain the status quo in the face of this dilemma, which leads to train professionals who are far from acting as true agents of change and innovation in the social environment.

Empirically, creativity is associated with the ability to create new things, while theoretically it is based on the quality of the final product; thus, it is expected that the individual is able to develop ideas or goods that are useful for the environment where he/she works. The process of teaching creativity is possible when the teacher understands the association of this capacity with creative thinking, that is, with the ability to formulate new conceptions of ideas; in this way, by developing divergence

and, therefore, original ideas, the final product can generate more value for the stated objective.

Throughout the stages of the model, problems have been identified in terms of capabilities and skills since the diagnoses show unfavorable results in this regard and few proposals have been found that explicitly detail the stages or objectives for implementing a strategy or a program that leads to change.

Although multiple actions have been implemented to promote transversal competencies in higher education, the success achieved lies in the interventions applied, with clear questions about the opportunity for improvement.

The evaluation of these programs is based on qualitative or quantitative research, giving positive results on the actions implemented and putting into perspective the lines of action. Institutionalization, finally, could be considered the most complicated because there is no variety of records on the programs or strategies already established, which could be since: 1) they are not old enough to collect data or 2) the proposals only remain in that phase. More than institutionalization, commitment is possible, since universities in Europe, the United States and Canada have successfully implemented actions that highlight the relevance of creativity and creative thinking, which give value to the generation of ideas and the training of professionals with thinking skills that can be adapted to any work environment.

Likewise, the use of technology in education has been retaken, giving the opportunity to the generation of strategies that can be implemented in virtual, hybrid or face-to-face modalities. This has also been a challenge for teachers, since in some cases there is still resistance to adapt to these environments, while students have come to depend on tools such as the Internet or specialized software to carry out their projects. The reality of creativity and creative thinking, both for teachers and students, resents the effect of these environments, leaving the question: to what extent can we teach how to develop an original idea? And this question also applies to the other characteristics of the skill.

Finally, it is emphasized the need to have proposals for improvement, where the process of successful institutionalization is considered, which allows to recognize the actions that are implemented to obtain positive results. ●

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