ΣΟΦΙΑ–SOPHIA

Methodological Proposal for the Development of Creative Thinking from Concurrent Engineering Design

Proposta metodológica para o desenvolvimento do pensamento criativo do desenho da engenharia concorrente

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Abstract

This article presents the results of the implementation phase of a case study that aims to establish a competency model for the development of creative and innovative thinking from concurrent engineering, such as management of teaching and learning practices in a Higher Education Institution (HEI) in Bogotá-Colombia. The activity was developed under a participatory action research method, which sought to explain reasons for the different aspects involved in planning, organization and the study of a product or service, by intervening from a model established as a classroom project contrasting these analyses with the first results of an exploratory type research of qualitative approach taking organizations and / or companies in real contexts for their diagnosis of innovation need. These transferability criteria are based on an interpretation of the concurrent approach when performing the existing state of the art and the behavior patterns of companies in order to highlight the particular critical dimensions. On the other hand, it is based on an analysis of the type of intervention model that allows its implementation in this type of companies. Consequently, the simultaneous work model integrates experiences and information through a set of elements, which allow visualizing creative skills to formulate novel ideas in the life cycle of a product or service, exposing the relevance of the present didactic strategy in integrating the academy with reality.

Keywords: Formative research, creative thinking, concurrent engineering, innovation, pedagogical practice.

Resumo

Este artigo apresenta os resultados da fase de implementação de um estudo de caso que visa estabelecer um modelo de competências para o desenvolvimento do pensamento criativo e inovador a partir da engenharia concorrente, como gestão de práticas de ensino e aprendizagem em uma instituição de ensino Ensino Superior (IES) em Bogotá-Colômbia. A atividade foi desenvolvida sob o método de pesquisa-ação participativa, que buscou explicar as razões dos diferentes aspectos envolvidos no planejamento, organização e estudo de um produto ou serviço, intervindo a partir de um modelo instituído como projeto de sala de aula, contrastando essas análises com os primeiros resultados de uma pesquisa de tipo exploratório com abordagem qualitativa, tomando organizações e / ou empresas em contextos reais para o diagnóstico da necessidade de inovação. Estes critérios de transferibilidade baseiam-se, por um lado, na interpretação da abordagem concorrente na execução do estado da arte existente e nos padrões de comportamento das empresas para realçar as dimensões críticas particulares, por outro lado, baseiam-se na análise do tipo de modelo de intervenção que permite a sua implementação neste tipo de empresa. Consequentemente, o modelo de trabalho simultâneo integra experiências e informações por meio de um conjunto de elementos, que permitem visualizar habilidades criativas para formular novas ideias no ciclo de vida de um produto ou serviço, expondo a relevância dessa estratégia didática na integração da acade- mia com a realidade.

Palavras-chave: Pesquisa formativa, pensamento criativo, engenharia concorrente, inovação, prática pedagógica.

Introduction

The training processes in research comprise a series of pillars that according to Fong, W.; Acevedo, R. and Severiche, C. (2016), in their article about formative research strategy in technological education, expresses that educational institutions have generated various actions that foresee the cohesion of the curriculum with pedagogical, didactic and investigative resources, where students integrate knowledge and skills of their own of their discipline, in order to achieve the strengthening of their cognitive skills, communicative and collaborative work. Ballesteros & Moral (2014) and Valderrama & Valderrama (2014) point out that to meet various needs, different pedagogical skills have been launched, highlighting among them the classroom projects or also called guided semester works. They look to take advantage of the knowledge collected in the subjects on a specific process or product, through which the student acquires the ability to relate theoretical concepts with practical experience to solve real problems (Barrientos, 2012; Canales and Schmal, 2013).

In this way, innovation processes in companies have rapidly transformed information into knowledge, and in turn, knowledge into innovation and is in new products and technologies (Murcia & Guzmán, 2015). Therefore, it could be determined that the classroom project is a driver of a collective construction of knowledge that contributes to the heart of educational policy as a nucleus for the strengthening of school management, a real concretion of all pedagogical actions. Reason for granting the idea to develop a pedagogical project that globalizes collective learning in the classroom and the experiences of reality by structuring a model, which forges competencies when participating in each of the stages or events for the development of a service or product.

To collaborate and contribute in all phases that leads to the construction and development of the product or service in benefit of the organization, which by essence becomes in a project that constitutes creative thinking. For this reason, this exercise was carried out in the subject "creativity and innovative thinking", as its purpose is to intervene in creative development to generate skills, abilities, aptitudes and attitudes to form novel ideas. A subject offered in all the study plans of the academic programs of the National Unified Corporation of Higher Education CUN, to guarantee the development of competencies in students while strengthening the research culture as it exposes elements, which allow proposing topics and projects that contribute to the advancement of professional knowledge, to present and develop ideas to improve what already exists, in the face of new business and social needs and opportunities.

A Method to Improve Communication: A Diagnosis of the Proposal

Defining a path of experiences and solutions that manage knowledge, constantly organizes, as Chadwick (2001) proposes, units with some kind of order that are called "structure". According to Saldarriaga P; Bravo G; Loor M (2016), learning or a reorganization of these existing cognitive structures at each moment are understood, or changes in our knowledge, seen as the process where new knowledge is incorporated from experiences, are explained by a recombination that acts on mental schemes and that for Piaget are part of intellectual development.

Integrated structures such as competencies to sort data and define a logical order through interaction and learning processes, which reviews the activities present in the life cycle of the product or service and tests changes from the moment of observing to marketing a draft. It is the educational psychologists, the designers of curriculum, of didactic materials (books, guides, manipulables, computer programs, etc.) and the teachers who must do everything possible to stimulate the development of these structures, which allow to build their own procedures to solve a problem. This, by providing the derivation of operations which provide "an organization's impetus to constitute the decisive factor that determines the success or failure of a business" (Kendrall and Kendrall 2011).

That is why, according to Molina and Carles (2006), Concurrent Engineering is taken as the basis for promoting a work where innovation and creativity meet the true needs of the products and services to be developed. Premises to link a set of techniques and tools that engage skills, in response to the need to improve communication and planning, between those responsible for specifying characteristics and manufacturing. By conceiving according to Saldarriaga P, et al. (2016), knowledge as a construction of the subject that is produced day by day as a result of the interaction of cognitive and social factors, this process is carried out permanently and in any environment in which the subject interacts and a work methodology

> "convergent of the different stages and requires that more time be invested in the detailed definition

of the product and in planning. Thus the **modifications are made in the design phase long before the prototype or production samples come out, which leads to a considerable reduction in cost. Although under this approach in the early stages time increases, it is also clear that the total cycle time** is substantially reduced, defined as Concurrent Engineering." (Industrial Engineering Online 2018).

This is how some action tools are determined to create knowledge, new ideas or expose and evidence different types of innovation. According to Rodríguez (2006), innovation is not only focused towards scientific and technological activities, but **is also presented through strategic systems** of management, commercialization as financial, and that **allow to give presence and testing prototypes. This leads to a set of activities that make the organization that is not able to change, according to Vélez X, Ortiz S (2016), runs the risk of stagnating or disappearing and to avoid it require the ability to generate different and original things, that is, creativity, not only to solve problems or aspects that negatively affect the company, but to inquire about new management approaches that allow us to seek, build or take advantage of opportunities to survive and progress.**

Thus, more accurate responses are generated through knowledge acquired for problem solving, under instruments to improve the creative act, by introducing changes that link tools that establish expectations to ensure that innovation is part of the daily work. According to Vélez X, Ortiz S (2016), innovation must be the DNA that companies want to be more competitive, which is not conceived in an environment alien to globalization since, in its change there are no geographical changes.

Therefore, by integrating an operational fabric that manages knowledge and fosters a culture of research, by giving proof of a meeting point between multidisciplinary work and reality, under a set of activities that are structured from knowledge, the continuous learning and information flows that the **organization perceives from the environment with the perception of a market opportunity and ends in production, sale and delivery of this product (Ulrich and Eppinger 2012). Reason why, the intention as argued by Penagos Cruz (2015), is to build spaces that promote research culture and the development of skills, in methodologies that allow it to approach the problem** using the scientific method. An environment of internal and external knowledge that identifies different **ideas in the proposed activity, which facilitates the insertion** of students in the scientific field in a creative,

pedagogical way and also develops activities in a line of work that integrate contents from different areas of knowledge.

This exposed in a scheme to filter, encode, **categorize and evaluate the information that one receives in relation to some relevant experience, when capturing the information. Therefore, it could be argued that the information and its management acquire a system of diagrams used to represent and expose ideas, tasks, readings, drawings or other concepts connected around the project to provide the participation of the different work teams. To paraphrase Rodríguez (2006), information and knowledge management acquire a decisive role, in particular the importance of knowledge of the external environment for the competitiveness of the innovative organization of the future has been emphasized.**

That is, both the arguments of Lewandowski, C.M. (2015) to generate information, so that a certain product or service materializes, as stipulated by Rodríguez (2006) where the information is transformed towards the result (based on applicable knowledge and with strategic value). **This provides the conditions** necessary for a continuous flow of knowledge to be presented throughout the structure, as a projectual method, in a continuous inquiry and interrogation, in a simultaneous thought in the search for the "moments or projectual instances" that arise from learning from the recurrent construction of a mapping that implicitly entails a spatial, formal and technical discourse (Flórez Millán, et al. 2014).

So, it is a strategy in order to achieve a **rapid creation and integration of ideas, which will consolidate into new or improved products. The model presented by the design management program as a factor of innovation, exposed in the book "Product Design: An Opportunity to Innovate" by Lewandowski, C.M. (2015), is adapted in such a way. To which it accesses and it is possible to link methods, practices, techniques and technologies that integrate collaborative actions in the** search for innovative proposals and ideas. In a continuous **flow of internal – external information to achieve a rapid creation and assimilation of ideas that have to be consolidated in the development of new products or processes (Rodríguez 2006) that; through the monitoring** of the environment and the acquisition of information, **ideas are classified facilitating their observation and eventual decision. Activities in teams used as useful tools to organize data when studying the project, holistically integrating participants in the creation of spaces necessary for products or services to tune into demands, expectations and be:**

- Desirable (design and marketing departments): It responds to desires and needs real, versus its functionality, reliability, usability and desire. Arrival of the channels that connect the offer with consumers, for the presentation of the brand and its services.

- Useful (administration and marketing departments): It articulates the acceptability of the product or service against the price and by generating a margin that makes the idea sustainable for the organization. Panorama that is made from a vision of having the project underway, a cohesion of viability in the development front to the difficulties of the company and its market, which facilitates the processes in installed and essential capacities that add value. Therefore, participants under academic experiences with business models and work networks project the value chain and integrate an associativity.

- Usable (administration and design departments): They carry the power to execute in a reliable, agile and efficient way the most appropriate techniques and technologies, which seek a creative proposal that develops in it the design events to satisfy a reality and giving a utility of the product or service. That they offer the performance by exposing the basic characteristics and their functions. Figure 1.

Therefore, it is about aligning divergent thinking competencies, in commercial operations they are also a decisive factor in determining the success or failure of a business to be desirable, useful and usable. Tools dedicated to the projection of pedagogical practices and diverse pedagogical material, warning strategic scenarios that allow the exploration of ideas, technologies, such as optimizing resources and knowledge.

Therefore, it is a systematic and sequential work for the improvement of activities from the departments of marketing, design and administration and engineering, since from the beginning of a project, it is committed to a multidisciplinary and participatory work. According to Flórez Millán, L. A., Ovalle Garay, J. H. and Forero La Rotta, L. A. (2014), as an operational tool and key piece of articulation and coordination between the different fields of knowledge. These, associated with the preparation of problematic axes and pedagogical practices that structure transformations of exploration of ideas within the review carried out in the development of a product that makes evident changes, the decision making in the initial phases and the requirements of areas that usually intervene later in the project (Barba 2000).

This is how new constructs were created that led to the proper implementation of the elements of innovation in a product (good or service), in a new marketing method or a new organizational method in the internal

Figure 1. Academic experience of simultaneous work (integrator) formed in the classroom, taking the concurrent engineering for creative and innovative thinking in the development of a product or service. Built from PDCA Home (2014) and Lewandowski, C.M. (2015).
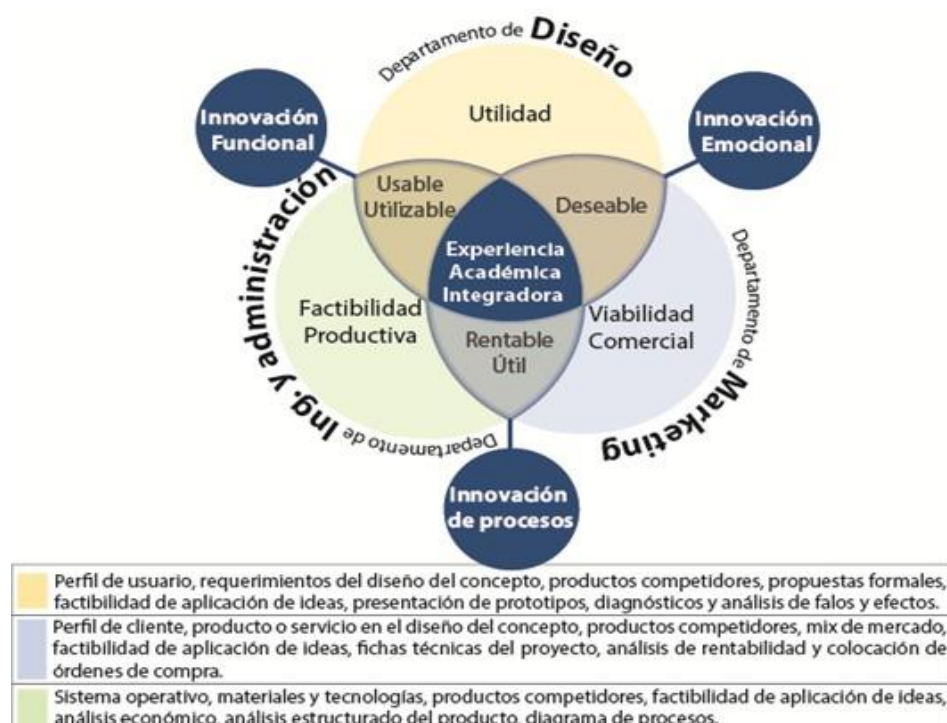
practices of the company, in the organization of the workplace or external relations (Oslo Manual 2006). Therefore, generating regular behaviors that allow the simultaneous performance of all development tasks, from the initial phases to the manufacture of the prototype thus allowing to avoid reprocessing, while in a sequential model there is only the possibility of returning to the previous phases of product development (Ríos, J; 1999).

Likewise, as expressed by Flórez Millán, et al. (2014), the word 'concurrent' acquires a deeper value, especially in the development of processes and methods that facilitate the achievement of the proposed objectives, improving the quality of products from the formal, optimizing production times, as well as the development and investment of resources. This in practices for creative and innovative thinking directs the proof of all scientific, technological, organizational, financial and commercial operations explored by the departments constituted in the classroom of:

Design Department: According to Lewandowski, C.M. (2015), in a quick and simplified approximation we can say that designing is thinking before doing, which implies two actions: thinking and doing. Regarding innovation implementing market and organizational standards, by including significant alterations in the technical specifications, in the components, materials, in the incorporation of software or in other functional characteristics, formal and / or aesthetic defined for the realization of the design in detail. Their participation has characteristics compared to a social process, which consists of thinking and working through different perspectives that often involves considerable conflicts and negotiations (Castillo, Álvarez and Cabana 2014).

Department of Administration and Engineering: Referring to the innovation that is carried out in the processes and their organization, by providing utility of new methods in the business (knowledge management, training, evaluation and development of human resources, management of the value chain, business reengineering, management of the quality system, etc.). It has the capacity to plan, design, implement, maintain and efficiently control the organization, to face new industrial structures that lead to the development of the product, by providing in the group a technological improvement of the information and the organization.

Marketing Department: Concerning innovation in marketing or emotional for notice its different processes of production and utility, when implementing new marketing methods, including

improvements in the development of design versus a product, price, place and promotion. Its contribution in the definition of the project involves knowledge of the context and trends of market share, to establish the ideas and proposals that are carried out as a team, to include significant changes in the design of the product, which are part of the new concept of commercialization.

It could be concluded, a pedagogical practice of simultaneous work that implements strategies in the classroom, to contribute to various competencies under the creative thinking that entails the process of collecting information, in cases that the organization assumes to achieve objectives. This through cases in the development that occur in innovations in a product or service and focus on managing the knowledge of its participants, linked to creativity. In addition, with the ability to apply scientific knowledge to an effective level of development of the student, not to accommodate to it, but to make it progress through its zone of immediate development or the margin of incidence of educational action (Rodríguez 2006).

Phases in the Simultaneous Activity of Collective Work

Returning to Flórez Millán, et al. (2014), when defining the Concurrent Engineering as an overlap of permanent activity, they cite Escorsa and Valls (2005), which establishes a transformation action that becomes and is conceived as "a proposal that changes the connection or link between the phases by the formation of a multidisciplinary team that develops the product in a constant interaction from the beginning to the final". This to give management to the selected resources that allow to be used by the participants with the possibility of discussion and of "achieving a process of collective production of knowledge" (Rodríguez 2006). Therefore, "research work is more productive, in which different disciplines converge and work is done according to academic communities" (Penagos Cruz 2015), applying technologies, techniques and tools organized under a set of steps ordered that start from the scientific method in the phases of:

- Strategic Definition (Empathy or exploration): Exploratory phase or global contact of the observation process that determines the relevance of the participants in the development of the creative processes and the challenge of the project. An event in empathy both inside and out

that reviews and observes the characteristics of the user, customer and the company, in its operating system or set of orders and actions that have an expense or asset for the organization and its environment (**Suppliers, buyers, distributors and the company itself**).

It aims to give an approximate overview of a reality and the number of resources they can contribute to the organization, thus introducing **pedagogical practice as creative thinking that has as its initial** object, the of promoting an attitude of trust and **responsibility in terms of the activities of its unit towards the group. This as Argued by Penagos Cruz (2015), creating a constant and lasting incentive that generates motivation in the research processes in each student and in turn counteracts the low participation and** deficient research.

Its evaluation is tested by having all the specialists who represent all stages of product design and development and who participate in this process from the beginning with a 100 % of dedication. The **possibilities of production are** identified when initiating the observation of facts, phenomena and the cause to determine the acquisition of more information by proposing manifest of certain aspects.

- Concept design (definition or **description**): phase where information that provides in the **challenge of** work is collected. The *context* and trends are defined as the *materials and technologies* (diagram of the organization's process flow) and **the** *design requirements* (aesthetic, functional, formal, symbolic and use) of the product. It is then a question of generating the pillars to develop elements of ideation, by integrating a set of knowledge that they elaborate to give precedence to knowledge management and technology transfer.

When the document that provides information about the project is validated, the evaluation of this stage is exposed, fundamental in a possible and provisional explanation that allows to explain the observed facts,

identifies the **competing** *products* and a comparative analysis is carried out which results in a reformulation of typologies. This in order to strengthen the process of reflection made in the analysis from the departments and their innovation referents for the postulation of ideas.

- **Detailed design (idea or relationship): Descriptive phase where the primary concern lies in describing some fundamental characteristics, allowing us to think carefully and draw conclusions from the** *market* **(product, price, advertising and point of sale). Proposals are developed that give** *form* **to significant changes in its components of the product or service and to** *economic analysis* **(process optimization). Risk factors in knowledge management and technology transfer are related to the feasibility of applying ideas. In the participation, creativity techniques that lead to the development of different methods of research of ideas and application in the project are potentiated, establishing proposals, which visualize materials and processes that fix the elements of the project and its participation in the organization.**

- **Testing (Prototyping or explaining): Phase where the conclusions are presented and the theory corresponding to the simulation is formulated prior to the manufacture, to find possible problems and perform a verification from of a** *structured analysis of the product* **(technical manufacturing plans, process diagram, assembly tree and list of parts). The presentation of** *prototypes* **and** *product sheet* **(usability and functionality tests) is displayed, which lead to the support of the types of innovation. This will help to socialize knowledge management and technology transfer in procedures, represented in the documents (petition, summary, description, claims and drawings) for the application of the patent (invention or utility model) of the product or service.**

- Marketing (Verifies or predicts): Phase where it is considered the sharing of the conclusions obtained by providing a forecast in the management of knowledge and technology transfer, the process diagrams become evident (assembly of parts, time analysis, certifications),

profitability analysis (purchase orders) and packaging diagnostics (failure and effects analysis), using feedback tools, so that information is collected on the impact caused by the final presentation of the project made in classroom. Figure 2.

Therefore, the present pedagogical practice or strategy of collective construction of knowledge, articulates experiences of reality by having different internal organizational elements, as in its execution to perform the functions and activities that optimize the academic dynamics within the study groups. Then, we can say that we are heading towards a project management procedure in information environments, where participants are ordered with different methods and tools that are alienated by communicating and demanding high levels of innovation in the interaction of their competences.

In the pedagogical playful process, it generates a classroom project to promote learning from role play with the guidelines of the subject, this by proposing in the learning environment a *model or simultaneous methodology* of collaborative and creative work

that improves not only the ability to work in a team, but the time of being innovative, both in personal and professional life. A contribution of quality through interdisciplinary methods and the use of multiple means of communication, such as the production of pedagogical materials that are more in line with the development needs of the community.

Therefore, according to Quiroga-Ramírez (2012) the projects promote the way of thinking, increasing creativity and imagination in the students offering them significant experiences to their daily life; that is, with the projects the students use their ability to create and invent, thus favoring the different learning styles that each one possesses. This motivates the recognition of a problem and of the process that instigates to observe (exploration), define (description), devite (relationship), prototype (explanation), produce (prediction) and / or sell (application) the innovation of a product in a logical and creative way.

Method of Management in Praxis

Linking a pedagogical practice in the classroom, under an interpretive epistemological approach and that takes concurrent engineering as a method of directing logical reasoning to obtain and make decisions
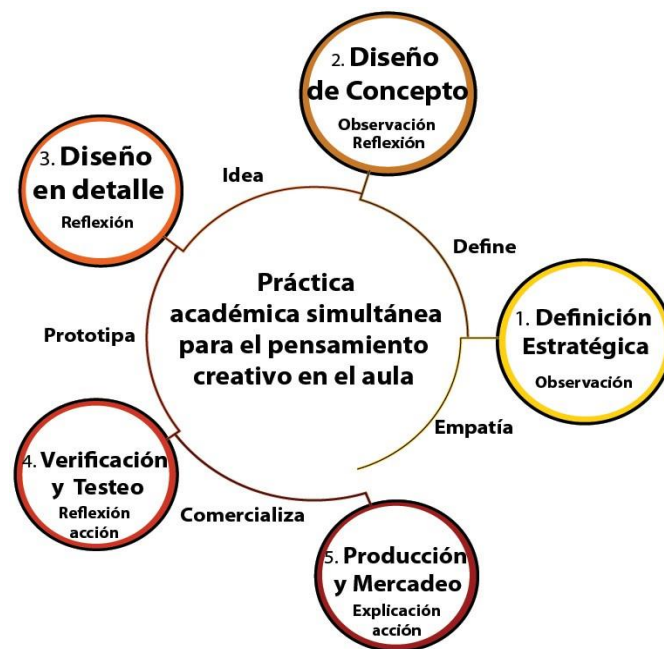

Figure 2. Phases for the development or improvement of the product or service with the accompaniment of a simultaneous academic practice for creative thinking in the classroom. Taken from http://msdproductos.diniko.com/ Source: Own adaptation

from premises, which contain data particular to individual experiences. According to Flórez Millán, et al. (2014), a hierarchical project practice, conceived from the technical knowledge applied by professionals of all types of knowledge, in a continuous overlap of foundations and methods for the resolution of problems that allow the achievement of autonomy integrality, innovation, interdisciplinarity and flexibility. These events lead to the management of knowledge and promote the participation of the exploration of the work challenge through the interaction of its participants and the acquisition of different technological communication tools, which regulate different stages that require more information.

This, on learning processes that start from the observation, the reflection until the virtual development, focusing its study and its simultaneous methodology of work to the redesign, development of the product or service, dynamics that led to propose different communication environments such as evaluation in forums, role plays, methods of research of ideas and presentations generated from the same case. This led to relate the problem, contemplate the teaching in processes, structure the contents and recognize in his work team competences and information, where the student acquires the structures in a natural and inevitable way and activate a complex process of construction by the subject in interaction with reality, which does not try to simply obtain answers, but what is really important is how learning occurs according to Saldarriaga P. et al. (2016).

Therefore, integrating the different competencies and feeding back the phases to explore, describe, relate, explain, predict and apply the events they guide, are presented as the levels of a scientific research and works as an information collector in the development of a product or service, this of an academic project in the classroom. In a nutshell, it was reflected in the competitive increase and dissemination of knowledge in an economic and social way. An engine of innovation and learning for an organizational space for dialogue, according to Saldarriaga P; et al. (2016) starts from the successive acquisition of increasingly complex logical structures that underlie the different areas and situations that the subject is able to solve as he grows. In Table 1, different methods were used to be tools that contribute to group work.

Table 1. Research techniques and/or methods that integrate the phases for creative thinking of organizational support in the development or improvement of the product or service. Source: Own adaptation

Stage	Tool or method of researching ideas
Explore	Interview
	Problem Tree
	Documentation
	People Files
Describe	Customer segment profiles
	Bechmarketing
	Brainstorming
Relate	Logical Framework (Mind)
	Prototype
Explain	Business Model
	Mockup Datasheets
	Prototype testing
Predict	
	Showroom

Therefore, generating spaces for the exchange of knowledge allows integrating several points of view throughout the project from signings, which are presented as an opportunity to record data, in the exploratory process. Systematic criteria that access a described mental structure, by obtaining an enlightening picture of the phenomenon of study, in relatively unknown phenomena, as stated by Sampieri R; Fernandez C; Baptista Pet al. (2010), to obtain information on the possibility of conducting a more complete investigation regarding a particular context, investigate new problems, identify promising concepts or variables, establish priorities for future research, or suggest affirmations and postulates.

Therefore, alternate this pedagogical practice to introduce innovation processes and communication strategies, in the "use of their own technological knowledge and in the application of their know-how to the development of new products or the improvement of their technological processes" (Ivañez 2000). This is how the didactic procedures facilitated the identification and visualization of data from the concurrent methodology, which began to collect most of the information and integrate it into a learning space, in order to explain a project that is achieved from of the balanced interconnection of all the conceptual aspects and approaches involved in the field of methodologies applied for the resolution of questions according to Flórez Millán et al. (2014). Consequently, it involves the interaction of questions between

the interdisciplinary subjects that benefit from the approaches set out in the learning outcome.

This is how these conceptual elements are channeled to the processing of systematized data to cover a need or an objective that acts as a formal activity of collection, integration, comparison, analysis and dispersion of internal and external information of the company of in a timely, effective and efficient manner (Koontz and Weihrich 2001). Thus promoting habits and a work philosophy based on a systematic approach to a product design with scientific characteristics in its development that aims to the participants, from the beginning, and to take into account all the elements from the conceptual design to its withdrawal, including the aspects of quality, cost, etc., and all those aspects related to customer needs (Luna A., 2004).

On the other hand, it is important to implement technological means in the realization of the activities, since it allows to continue the deepening, so that this leads to carry out an investigation of a higher level (Penagos Cruz 2015). This facilitates not only the design that bets on an interdepartmental work in the management of compressibility, navigability, and interactivity, but also the improvement in a structure of an organization that provides the sum of the knowledge of its members and the practical interpretation of it (Roos, et al. 1997).

Conclusions

A collective teaching-learning activity incorporates, according to Flórez Millán, et al. (2014), the basic and disciplinary components of each of the fields of knowledge, and therefore establishes a link with the searches, concerns and the construction of singular problems that each individual as a linker of information establishes according to their concerns. This allows, in turn, to implement different methods and methodologies of research, of ideas such as communication technologies, by transforming not only the productive system, but the pedagogical dynamics under a collective structure that is seen from the same reality. Therefore, to link the research process in reality, from the technological and methodological point of view, in order to relate all the activities related to the change management of an organization.

This model allows new ways of penetrating reality, using according to Sampieri R; et al. (2010) the exploration as the constitution of an end in itself, which generally determine trends, identify areas, environments, contexts and situations of study, potential relationships between variables; or set the "tone" for more elaborate and rigorous subsequent research. This to build premises to sustain

its explanation, allowing professionals to promote autonomy and anticipate problems by getting involved in the field of methodologies applied to the resolution of questions, which implies the interaction of study leaders at each level (Flórez Millán, et al. 2014). A link of theory and experience as pedagogical practice in formative research, an opportunity to work in a multidisciplinary way in the recognition of factors for its solution, both within organizations and the relationships that collaborate in their production.

For example, the manipulation, development of new programs and manipulation of different ICT tools towards the total development of the project, by promoting an attitude of trust and personal and collective control that strengthens the capacities and skills of their disciplines to optimize knowledge in an integrative work. These determine according to Fong, et al. (2016), changes in the responsibility of each student for the social commitment they acquire, as a learning strategy in education, by stimulating the senses of creativity, research, reading, commitment and exploration, in the face of the different problems that arise.

Strategic spaces in academic activities, aimed at opening environments where future economic links are articulated that promote and project business communities, through structures of interaction with their environment and their learning processes. Therefore a dynamic as argued by Misas (2004), with the aim of promoting systems that operate with higher quality and efficiency, based on granting a new role to governments and the functioning of the market, for decision-making in the support of projects and ideas of entrepreneurship.

Consequently, a methodological proposal for the development of dynamic creative thinking in the classroom, which breaks with the traditional scheme in the development continued in strategic management that explores a reality. These interactions start from the information so that it is analyzed, designed, implemented and concretized, so that it is reproduced. A permanent update that contributes to the development and integration of research tools, for the development of theoretical competences and experiences, as practices that allow the development of skills. An attitude towards internalizing knowledge based on observation as a pedagogical practice of participation and result the deepening of the subject and the confidence of the student to feel accompanied and oriented in the search for information.

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