

## Comprehensive Evaluation of Constructivist Methodologies from the Balanced Scorecard

Evaluación integral de metodologías constructivistas a partir del Cuadro de Mando Integral

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### Abstract

It is common to evaluate university courses through the opinion of those involved in the training process, responding to a Likert-type evaluation format to synthesize teaching performance. This research arises with the intention of comprehensively evaluating the development of a course, including all the actors involved in the academic process. The main objective of this research is to determine the effectiveness of the constructivist training method in the business administration program, being evaluated from the Balanced Scorecard (CMI) and other administrative management tools; from the perspective of the student, the entrepreneur, the institution and teaching. For the validation of this tool, it is applied in a course in the process area (Process Management) and is replicated in those where the constructivist methodology is applied within the University. For the study, a quantitative and qualitative analysis was used, supported by surveys and a checklist, carried out and evaluated by students (38) and four businessmen. This research presents as main result a road map that helps the dynamics of the evaluation of education in an integral way in each university course and at the same time contributes to improve the performance of the different actors involved in higher education.

**Keywords:** Educational evaluation, Business administration, Higher education, Training method, Methodology.

### Resumen

Es común la evaluación de cursos universitarios por medio de la opinión de los involucrados en el proceso formativo, respondiendo a un formato evaluativo tipo Likert para sintetizar el desempeño docente. Esta investigación surge con la intención de evaluar de forma integral el desarrollo de un curso, incluyendo a todos los actores que intervienen en el proceso académico. El objetivo principal de esta investigación es determinar la efectividad del método de formación constructivista en el programa de administración de empresas, siendo evaluada a partir del Cuadro de Mando Integral

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(CMI) y demás herramientas de gestión administrativa; desde una perspectiva del estudiante, del empresario, de la institución y la docencia. Para la validación de esta herramienta, se aplica en un curso del área de procesos (Gestión de Procesos) y se replica en aquellos donde se aplica la metodología constructivista dentro de la Universidad. Para el estudio se utilizó un análisis cuantitativo y cualitativo apoyado en encuestas y lista de chequeo, realizadas y evaluadas por estudiantes (38) y cuatro empresarios. Esta investigación presenta como principal resultado una hoja de ruta que ayuda a la dinámica de la evaluación de la educación de forma integral en cada curso universitario y a la vez contribuye para mejorar el desempeño de los diferentes actores involucrados en la enseñanza superior.

**Palabras clave:** Evaluación de la educación, Administración de empresas, Enseñanza superior, Método de formación, Metodología.

## 1. Introduction

From constructivism, this process can be thought of as a dialectical interaction between both the professor's and the student's knowledge, which enter into discussion, opposition and dialogue, to lead to a productive and meaningful synthesis: learning (Ortiz, 2015). How can the impact of the application of these constructivist models be evidenced in students? Are these models cognitively accepted by learners? Is the application of the model effective and satisfies the expectations of the external sector? and, is the university institution achieving the expected results by improving the performance of tests for being measured before other Universities? These questions seek to optimally evaluate the different aspects or items involved in the application of a constructivist methodology with respect to the courses that have the scope of applying management tools in the business sector. Based on this principle of continuous improvement, the objective of this research is to determine the evaluation of the constructivist methodology in the Process courses from the Balanced Scorecard (CMI) in the student, in companies and in institutional scopes.

This work demonstrates in a different way, the form of evaluating courses at the university level. It describes how through some administrative management tools improvements can be made by different actors involved in the development of the

Process Management course. This course has, like others in the Business Administration program, activities to intervene in the business sector. Therefore, the evaluation of its development can be carried out in light of four main actors: the Institution (University), students, businessmen and professors. The course design, its execution, results obtained, and the improvement plans to continue its execution are then presented.

The theoretical references that support the development of the research, the methodology used, and the results obtained when applying the CMI tool for the comprehensive evaluation of the constructivist methodology in the chosen course are presented below. There is also a section that offers consideration to the conclusions obtained in the study and the respective recommendations for using the tool in other types of courses.

## 2. Theoretical framework

The modern conception of the new interactions between students and professors with the rise of new technologies and the demands of the professional market have changed. It is proposed that students have more spaces to develop their skills and thus apply what they have learned. It is necessary to develop didactic strategies aimed at enhancing the different intrinsic abilities and skills in each of the students. In this section, the methodologies that are recommended to be applied in the analyzed course are described, in turn, different administrative tools that were used for the evaluation from different perspectives that are defined from the WCC theory are explained.

### 2.1. Constructivist methodology

Constructivism, first from a philosophical perspective and then developed as a pedagogical approach, prioritizes reflection, meaningful and active learning, by placing people as knowledge makers (Araya and Espinoza, 2018). Constructivist education methodologies respond to a model focused on students, in which they are actively involved in their learning, and it is intended that the professor be a facilitator of knowledge and advisor in the different projects developed in

the classroom. This research proposes the application of an analysis under the indicator system based on the CMI methodology. The application of this management tool allows the evaluation of the aspects that have been taken into account in the development of this research, "because this system of indicators allows verifying and evaluating the quality of the curriculum management in relation to the objectives that the educational institution has set itself" (Gómez and Sánchez, 2013).

## 2.2. Collaborative learning

If one of the members of the group has number skills, he should organize with someone who is a good reader, and at the same time these two will look for a another person (innovative, creative), and these three will look for a person who likes to live experiences to learn (usher). This would be the ideal that cooperative learning professes, according to Santana, Pulido, and Rodríguez (2019):

The three requirements of cooperative learning are: first, the one that has to do with the commitment of the students to achieve as a group a certain group task, which implies having techniques that lead them to that end. Second, solve the task as a team, which implies the work and contribution of each of the group members. The third emphasizes the resources that the group must have, for the final achievement of the activity.

If in the collaborative groups, they manage to meet these characteristics, the educational experience through the development of the course becomes more significant, because everyone will learn from each and everyone will take full advantage of the skills of each member. In addition to seeking to find students in a group with individuals of different characteristics, it is also intended that they learn to work as a team, to tolerate, and resolve possible conflicts in a conciliatory and sometimes tense environment such as that of the classroom, especially in times of uncertainty when the deadlines for jobs are approaching, and for some reason the north has been lost. This leads to instill in the business administration professional the importance of teamwork and solve each situation bearing in mind his own and others'

opinions under the premises of tolerance and respect.

## 2.3. Problem Based Learning (ABP)

It is a simulation before they face real problems, through an environment of controlled situations in which the professor evaluates the decision-making of his students. It also measures the students' analysis capacity and the way in which they solve problems and make the appropriate decision before different alternatives, according to Fernández and Duarte (2013):

ABP is a teaching method characterized by the use of "real world" problems established as contexts in which students develop their critical and problem-solving skills, while acquiring the essential concepts of a given field of knowledge.

This teaching methodology tries to identify the command competences of the students before certain parameters of specific situations, and according to the decisions made by the collaborative group, they will dimension the situation in which they are and solve "the problem" according to the inventiveness, conceptualization, and innovation of its members.

## 2.4. Project-based learning

Project-based learning is a broader category of learning than ABP. While the project aims to address a specific problem, it can also address other areas that are not problems (Martí, Heydrich, Rojas, and Hernández, 2010). The "task" in these courses consists in intervening in a company and carrying out the analysis of the process management theory after having developed a diagnosis that leads to an action plan that the entrepreneur is in the possibility or viability of executing in accordance with his needs. Students must collect or collect information through a checklist and value scales (investigate), with the data found, make a diagnosis (analyze) using different business management tools and propose solutions (build) that improve conditions of the intervened company. Although, its final grade does not depend on the approval of the plan by the entrepreneur, it conducts an

evaluation based on the research, analysis, and construction capacity that the working group carried out. Therefore, it is a good training for students to experience what it is like to face the business world and at the same time evaluate their abilities as administrators. Project-based learning supports the learning process and developing skills that will be necessary for them in the future as professionals” (Bernal Pinzón and Monroy Nova, 2018, p. 68).

### 2.5. *Inverted classroom*

This teaching methodology is important because it helps the professor to take advantage of the time allocated in the classroom, to apply through the other learning tools the knowledge or theory that the student has previously consulted especially in audiovisual media. It should be noted that before starting the class session, the professor will make a brief diagnosis of the topic that the student previously consulted to know the level of interpretation and resolve the doubts that the student has. According to Coufal (As cited in Martínez, Esquivel, and Castillo, 2010), he states that:

The inverted classroom aims to reverse the moments and roles of traditional teaching, where the chair, usually taught by the professor, can be attended overtime by the student using multimedia tools; so that the practice activities, usually assigned for home, can be carried out in the classroom through interactive collaborative work methods (p. 145).

### 2.6. *Business manager training*

The business manager today must develop skills and competencies. Companies look for trained and flexible people that demonstrate their ability to adapt themselves to any change (Gorges, dos Passos, and Wollinger, 2018). In addition to these competencies, the manager must provide solutions to different problems that arise in the organizations in which he works, all framed in the duty of being an ethical and proactive professional, characteristics that lead to being a comprehensive professional. According to Gutiérrez and Berrio (2011):

in the world, the need to establish the competences and the meaning of these that must be acquired in training has been openly manifested; therefore, Universities should be focused on developing the necessary competencies in students or perfecting their talents by providing them with solid basic concepts through effective teaching methodologies.

The function of a graduated business manager is to generate solutions and propose alternatives for the continuous improvement of companies in which he applies the knowledge and professional experience acquired. Given this description, it is necessary that higher education institutions allocate their academic resources in the training of comprehensive professionals, who can perform in the workplace with the ability to learn and act faster than their competitors. If we try to explain concepts and theories within the classroom without their respective application, most likely the student will not have the necessary skills to guide and be a proactive participant of a work team. The different administrative management tools and concepts that are taught in the administration program, must be articulated with the reality of the country's business, which questions the way professors train their students. Today, it is more useful to focus on how to teach the student ways of thinking, since these enable them to face various problems, at different times and contexts (Hernández, 2017). The fact is then to concentrate on the teaching-learning process. This is why methodologies such as the inverted classroom, competency-based learning, and collaborative learning have students' development of both social and technical skills in common, because they focus their efforts on the learners in an active way, exercising their way of thinking. These methodologies combined with various teaching tools such as problem-based learning (PBL), case studies, role play, and others of a dynamic nature, can offer alternatives to improve the performance of each one of the students with the objective set in the development of competencies, which allow better performance in decision-making in the face of simulated or real problems.

Different types of learning require appropriate assessment, and practical skills

require completion and evaluation of practical tasks (Steedman, 1994). It is emphasized that it is necessary to evaluate if the students really developed these competences, and to do it objectively, the environment in which the student is involved must be taken advantage of. Therefore, it is recommended that the business environment measures students' performance and as a consequence it would measure the impact of the learning process on them.

Thanks to a business-academy interaction, the student can visualize the responsibilities and duties of the training program, realize the scope of his academic and professional work and how, through the different management tools that are given in theory, he can address the problems that happen in the company. For this reason, the proposal for a comprehensive education consists of not waiting for students to have a relationship with the company in the last terms, but rather as the student progresses academically, he can interact and somehow intervene in business processes progressively as he progresses in his training. But for the philosophy of comprehensive education to be viable, it is necessary for students to have developed certain skills and abilities in advance, and this is only possible if professors instill in them and in a good way, those learning methodologies and tools that focus on the development in the learner's skills.

### *2.7. Adapting management tools for the evaluation of the educational process*

Since 1950, Deming proposed the PHVA cycle which was adapted by all organizations for the continuous improvement of their processes. The PHVA cycle is a cycle that is in full motion, which can be developed in each of the processes. It is linked to the planning, implementation, control, and continuous improvement, for both the products and the processes of the quality management system. (García, Quispe, and Ráez, 2003), "and that it can be applied in all fields" (Espitia, 2016). From this model, business management tools based on this philosophy were developed. One of them is the CMI. The tool was quickly incorporated by various companies, which demanded to apply the system to solve important

problems: how to implement new strategies, how to make employees understand these new strategies and apply them in their daily work. (Amat, Banchieri, and Campa, 2016). In this tool, four perspectives are presented in which the objectives and indicators are developed: the financial perspective; the customer's perspective; the perspective of internal processes; and, finally, the perspective of learning and growth focused on human talent. Kaplan and Norton (2005) explain that in cases where the organization requires it, additional perspectives could be incorporated or some of those established in the theoretical mode could be dispensed with.

For the development of the WCC strategy, the strategic planning of the company must be taken into consideration, that includes mission, vision, values, policies, and strategic objectives. Based on this information, added to the diagnosis of the organization, new strategies are designed to bring the company closer to achieving its strategic design. Then, action plans are established to guarantee the success of the strategies, and finally the CMI is created to measure the behavior of the different processes of the company with respect to the objectives and strategies outlined.

The four perspectives of the scorecard have proven to be valid across a wide variety of companies and sectors. The four perspectives (financial, customers, processes, and learning) should be considered as a template and not as a mathematical theorem or a straitjacket (Kaplan and Norton, 2005).

For the effect of this study, each of these perspectives were replaced by the evaluation carried out on each of the actors involved (University, students, businessmen, and professor), and were measured in light of the administrative management tools (Table 1), with which improvements can be made in case the results are not as expected. Additionally, the justification of the change to these new perspectives is proposed.

The importance of applying the CMI is that there is due feedback; therefore, in each perspective, in case of not presenting satisfactory results, the assertive management tool must be applied so that the academic process is directed in a better way.

**Table 1. Perspective and administrative management tool**

Perspective	Management tools to use	Justification
University	Thorns of fish	The institution for its support needs to attract students, one way is to show good results in "SABER PRO" tests.
Students	SWOT	It is necessary that the students are comfortable with the constructivist methodologies offered by the teachers in charge
Businessmen	HR improvement process	A valuable result is that students demonstrate their mastery of acquired knowledge applied in the business environment.
Professors	Organizational learning	It is very important that human talent is trained and understands the influential effect it has on the institution's clients.

Source: Authors' own elaboration.

For the University perspective, the tool known as fish bone is chosen. Karuo Ishikawa in the early 1950s developed this tool, also known as the cause and effect diagram. "It is a graphic representation that organizes in a logical way and in order of greatest importance the potential causes that contribute to creating a certain effect or problem" (González, Domingo, and Sebastian, 2000). Once the unwanted effect has been determined, this tool is continued to detect the causes that give origin to that effect. In order to adapt it to the object of study, it is sought to discover what are the causes that give rise to the low level of the students' scores in SABER PRO test. It should be noted that in each course of the Business Administration program, these types of exams must be taken. One of the ways to carry out marketing is by accrediting the program and one of the indicators that must be shown to the National Accreditation Council (CNA), are the results of the SABER PRO tests at the undergraduate level. That is why this perspective is compared to that of finance, since the sustainability of the institution and the program depends on the students (clients) who enroll each term. If the causes that originate the possible low scores are found, actions and improvement plans to efficiently eliminate the causes that determined the low level of the indicator should be taken.

The perspective of students is called that way, because they are the clients of the institution, and the latter is concerned with the fact that the clients feel comfortable in different areas, especially with the methodology proposed by the respective

professors, since the way of guiding training influences meaningful learning for students. According to Fábela (2009):

For meaningful learning to be achieved, it is necessary to be self-initiated and for the learners to consider the topic, content, or concepts they are going to learn as something relevant and meaningful for their personal goals and for personal development and growth..

Due to the importance of this perspective, if there are results below the established goal, the SWOT matrix tool is chosen. The initial objective of the SWOT analysis was to determine the competitive advantages of the analyzed company and the most convenient strategy to use based on its own characteristics and those of the market in which it operates (Juliao, 2011). And those strategies that derive from the crossings will be translated into action plans to follow, in order to offer a course design that guarantees that the students feel comfortable in the development of the sessions, and - above all - that they have significant learning, which can serve them for their academic and professional life.

In the development of a course that seeks to intervene in some way the processes in a company, what is intended with this type of consultancy is that it is successful and that the businessman feel comfortable with what has been developed by the students. As this interaction is the result of the planned educational process, the name of the perspective of processes is changed to entrepreneurs, because they are in charge of the business unit and perform the respective

evaluation of what has been done by the students. In the event that this intervention does not have the expected results, a process of improvement for the student is carried out, just as it is done business-wise with human talent when organizational learning is applied. According to Stable (2011):

In order to achieve organizational learning, it is necessary to develop mechanisms for capturing, storing, interpreting, transmitting, producing, and evaluating information and knowledge, which make it possible to carry out the most of the learning that takes place at the level of individuals and project teams, where the latter outperform individual performance when the tasks involved require multiple skills, common sense and experience.

In this perspective, action plans would be designed so that the student improves the service provided to the entrepreneur and likewise, this action will have an impact on improving their performance in the course.

Regarding the teaching perspective, which is the human talent that trains clients (students) in learning, the new emphasis is placed on teaching processes, strategies and thinking skills using disciplinary and cultural knowledge as a means for personal growth (Montero, 2007). Therefore, the professor's performance is governed, among other measures, by the evaluation of the students who were under their tutoring during the course. In a way, this perspective is related to those previously described, because the professor guides the success of the other areas mentioned. Without his assertive guidance, the student body would not develop the necessary skills to propose business solutions and without a successful business intervention, the University would not have a good name in the real sector. This type of relationship between perspectives is key when evaluating the WCC. According to Gutiérrez (2010):

The CMI is a methodology that translates the strategy of an organization into a set of objectives with its cause-effect relationship, the fact of having the strategic objectives related in a cause-effect scheme facilitates the understanding of the strategy to meet them, as well as their understanding by all areas of an organization.

It is implied that the objectives that are taken into account must be related, this influences the way of measuring and deciding which would be the most important resource within the University and what should be paid more attention in its measurement while continuing to side others.

### 3. Methodology

The present research with a quantitative, descriptive, and transversal approach, supported by qualitative research tools, which hypothesis is that the courses can be evaluated using a systematic approach typical of the Balanced Scorecard (WCC) methodology. In this case, evaluations carried out in a Process Management course were taken into account as the first part and, according to the results, this type of evaluation could be extended different courses in the same area. There was a population of 38 students, the professor who taught the course and 4 businessmen who evaluated the processes carried out by the students. The instruments used to collect the information were: the exams and surveys presented by the students, a checklist completed by the employers, and finally, the professor's evaluations. Indicators were built according to the CMI theory to obtain the results.

For this study, the competencies described in the thematic axis of the courses in the process area belonging to a Business Administration program offered in a university in the Medellín were taken into consideration. These competencies were classified as objectives in the respective areas to which they belong and respond to three fundamental moments in the student's cognitive development, which is associated with the constructivist learning philosophy implemented in the institution.

Moment one is related to the University area, which consists of the appropriation of knowledge, corresponding to the theoretical and conceptual component that the student must have as a basis for the appropriation of the reference theory.

The second moment is related to the students' perspective, and is based on the

**Table 2. Classification of objectives**

Areas	University	Students	Businessmen
<b>Courses</b>	<b>Objetives</b>		
Process Management	To structurally defin an organizational pocess	To characterize organizational processes	To Propose improvements in organizational processes
Technology Management	To appropriate the models of technological management distinguishing their differences and fields of application in the business field.	To identify technologies and other technological variables that the organization uses to achieve the critical success factors of its priority in Strategic Business Units.	To build corporate, business, innovation, and technology strategies in an integrated way
Management indicators	To identify the elements and characteristics of a successful management	To diagnose competitiveness and competitive advantage from Management Control	To use the tools and instruments necessary for the design, construction, and implementation of Management Indicators

Source: Authors' own elaboration.

construction of knowledge, which “allows understanding its forms and mechanisms of action and understanding how it carries out the processes of innovation, training, learning, research, and other actions” (Nagles, 2007). In this second moment, students understand the importance of the acquired theory, and from this, they relate, develop, and build knowledge for its possible application.

The third moment is related to the entrepreneur perspective, consists of the application of knowledge; students use the knowledge developed in a real scenario, testing their skills and abilities for problem solving, based on the evolution of their learning and acquisition of previous knowledge.

The objectives of the different courses are classified according to the perspective and moment to which they belong. The teaching perspective is not included because it is measured by the University bearing in mind the teaching regulations that govern the institution (Table 2).

Once the objectives of the different courses involved in a stage of business intervention and their relation to the moment to which each one points, the perspective is also related to that moment. This is verified in the relationship between perspectives, since the University requires that the students have a good performance in the state tests “SABER PRO.” Students are interested in the

functionality that the theory studied may have and entrepreneurs are interested in that the students can efficiently apply the acquired knowledge. Only the teaching perspective is measured by University standards and would be common in all courses.

Now, to measure the objectives according to the perspectives, it is necessary to carry out a good design of the measurement instruments, since these will yield the results that feed the proposed indicator. The measurement instrument is then proposed: the way in which the values will be obtained (reading point) and the design of the formula (if necessary) that will determine the result of the indicator for each one of the perspectives that are involved in this research (Table 3).

### 3.1. Tests

Like in the majority of undergraduate programs at the national level, students are evaluated through tests to determine their level of learning appropriation with respect to the course taught. Academic performance in higher education constitutes an indicator of the quality of the initial professional's training processes (Vásquez, 2018). In the specific case of the University, students per course are given at least one cumulative test of individual knowledge. The characteristic of this test is that its structure is similar to the question sessions used by the Ministry of National Education for the “SABER PRO”

**Table 3. Measurement of the objectives according to the instruments**

Measuring instrument	Reading points	Formula
Tests	Student evaluations are taken, and the average of the results obtained is determined.	$(\text{current group average} / \text{previous group average} - 1) * 100\%$
Survey	Nine questions are asked to the students about the methodology and their participation in the development of the course. A scale of 1 to 5 is used for the answers, being 5 excellent and 1 deficient.	Average of the results obtained in the responses.
Check list	For each process intervened, the employer, according to predetermined items, evaluates the improvement made by the students.	$(\text{Processes successfully intervened} / \text{total number of processes intervened}) * 100\%$
Professor's evaluation	At the end of the course, the students evaluate the management of their professor in the development of the course. On the same scale from the perspective of students.	Average of the results obtained in the responses.

Source: Authors' own elaboration.

tests, with the intention that students become familiar with the dynamics of state exams and obtain good scores, in such tests. For the measurement of the University perspective, the results of the academic test of individual knowledge developed in the current group are taken into consideration and compared with those of the students linked to the previous group.

When applying the test results of the groups of students per terms, regardless the result showed in the calculation, the sign that accompanies the data is taken into account. If it shows a negative sign, it means that the students' performance on the test was lower than that of the previous group, if it is positive, it implies the opposite. It is taken into consideration that the positive sign is the score to be reached (goal) and at least the zero score is accepted, since it shows neither improvement nor setback.

### 3.2. Survey

The survey is carried out with the intention of evaluating the teaching methodology used and, at the same time, the level of commitment. It measures the students' perspective and is applied to those who were part of the course. The questions pointed to specific

themes of methodological development and the level of motivation that the teaching-learning process produces in students. The student responds on a Likert scale following the concept: assessment of one as low, two as fair, three as acceptable, four as good and five denotes excellence. The expected results when this measurement is applied is that five points and at least four points are reached as a goal. Table 4 contains the questions that are asked to the students and the theme that seeks to evaluate each question.

### 3.3. Check list

In the employer's perspective, the aim is to know the degree of acceptance that the person in charge of the area or even the manager of the organization has with regard to the processes intervened by the student. The format is evaluated by processes intervened in the company and according to the result of the questions found in the format (Figure 1), the employer gives his assessment in percentage, in which three alternatives can be given: approved, reengineering, and not approved.

The minimum result to achieve would be 75% in this case, but it is expected to be the same as the goal, seeking 100%.

**Table 4. Survey for students' perspective (clients)**

Evaluated theme	Questions
Significant learning	Does the methodology used by the teacher promote meaningful learning?
Technological resources	Do the use of technological resources improve the learning process?
Practical application	Does the professor guide the process in the practical application of the contents?
Participation in classes	Are participation and debate in class activities encouraged?
Motivation	Am I more motivated learning with the proposed methodology?
Autonomous time	Have I independently studied and learned the lessons autonomously?
Study material	Has the previous material been of great help in understanding the subject?
Source: Authors' own elaboration.	

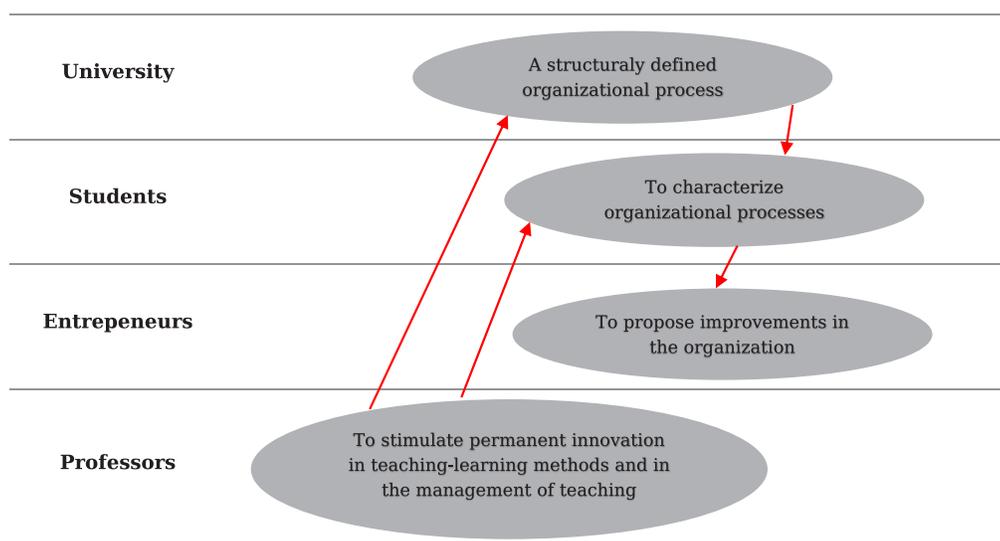
**Figure 1. Example of entrepreneur's checklist**

Company's name					
Students					
Process					
Item	Criteria to verify	Applies	No	Value (%)	Comments
1	Were administrative tools such as SWOT, cause and effect diagrams, and action plans applied to design process improvement?	X		20%	
2	Are the results of the study presented including benefits, possible difficulties and are the indicators for measuring the process structured?	X		15%	
3	Will the results obtained in the business intervention serve as input to restructure the organization's processes, and thereby be more competitive in the market?		X	20%	
4	Are you satisfied with the results obtained in the business intervention?	X		25%	
5	Would you ask the University students to intervene in other processes of the organization soon?	X		20%	
Evaluator's name, position, signature, and identification document	Summary			80%	Approved 75%-100%
	Calificación				Reengineering 50%-74.99%
					Not approved <50%

Source: Authors' own elaboration.

When the total is between 50% and 74.99%, students are recommended to carry out the analysis again according to the light of the recommendations made by the employer. It

should be noted that before presenting the result of the intervention to the company's representative, the students analyze with the professor the work carried out.

**Figure 2. Cause and effect relationship of the objectives**

Source: Authors' own elaboration.

### 3.4. Professor's evaluation

Through the institutional academic system, professors are evaluated on a scale of one to five on the items of: interaction, evaluation, learning, and planning. This evaluation is carried out by students at the end of each course. Additionally, professor's direct head also evaluates their performance in the different tasks (research, extension, academic, and administrative fields). By internal regulation of the institution, an improvement plan is carried out if the evaluation result is less than 4.0 points. This metric defines the minimum score to obtain a good result and the goal of five points.

## 4. Application and results

As previously mentioned, the course chosen for conducting the research was Process Management. The test was carried out with 38 students, and prior to its completion, the respective surveys and evaluations were carried out by the interested agents. (Figure 2) How the objectives of the WCC are related between the different perspectives of this specific course is explained below. This scheme reflects the intention of achieving the objectives together, evidencing the continuous improvement of learning.

This relationship is justified by assuming that the basis for a successful intervention in the company is a suitable preparation of students, that is, that their learning is not only practical. But for students to achieve this relationship between theory and practice, it is necessary that the learning methodology developed by the professor throughout the course allows the achievement of this objective; therefore, the fundamental basis of this relationship is the professors' expertise and in the way in which it can intervene in students to enhance their abilities. Regarding the data used as values validated by the measuring instruments for this test, the written tests from a previous term were compared with the results obtained by the students of the analyzed course (2018-02). From this same period, the evaluations that students made to the professor were taken.

The CMI presentation is then evident (Figure 3), specifying the area, the corresponding objectives, the name of the chosen indicator, the parameterized formula, the ranges of acceptance of the values, and the result according to the pilot course test.

For this research, and with the application of the pilot test, it is determined that the results obtained were satisfactory, since they are within the allowed range and some

**Figure 3. CMI Process Management course**

	1perspec-tives	Objetives	Strategies	Formula	Values		
					Goal	Tolerance	Deficiency
University	A structurally define organizational process	Knowledge appropriation	$(\text{Average current tests} / \text{Average previous tests}) - 1) * 100\%$	+	0	-	6.23%
Students	To characterize organizational processes	Significant learning	Result of the surveys according to the scale used for its measurement	5	-1	<4	4.61
Entrepre-neur	To propose improvements in an organization processes	Practical application	$(\text{Successfully intervened processes} / \text{total processes intervened}) * 100\%$	100%	-25%	<75%	100%
Professors	To stimulate permanent innovation in teaching-learning methods and in the management of teaching	Teaching performance	Result of the teaching evaluation	5	-1	<4	4.67

Source: Authors' own elaboration.

values reach the established goal. The idea of applying this type of tool is that a traceability can be carried out term by term of the conditions of the different courses and of the actors involved in the educational process. In addition, if a low performance is detected in any of the perspectives, quickly with the administrative improvement tool, the pertinent solutions would be sought to achieve the results that are proposed as satisfactory.

## 5. Conclusions and recommendations

From the research exercise carried out and the results obtained, it is concluded that the constructivist method is effective for the training process of business administrators. Since, it allows the significant acquisition of knowledge by the student that allows him to propose solutions that improve the performance of an organizational process. Furthermore, the dynamics presented by constructivist methodologies make it easier for the student to develop different skills and competences that the market demands of him.

However, the WCC presents an improvement plan that is adapted to the circumstances of the development of the training process. It integrates various administrative management tools which purpose is to promote continuous improvement, objectively evaluating professors' performance, student monitoring and to seek alliances with the business sector. Each of these characteristics contributes to the good performance of the university institution and tends to standardize procedures that, if applied at the University, can promote a significant change in the improvement of the training process.

In accordance with the above, this teaching methodology allows the student to immerse himself in the business context of which he will be a productive part, that is, it takes the student to the plane of reality in organizations in terms of his work and the contributions that from his profession can perform. Therefore, this methodology is effective for the higher education system, in order to promote spaces for business participation in courses from the fourth term

on, in which the student can develop from the first terms the skills and competencies necessary and proper to a good business manager. This, must be combined in the right measure with a formative follow-up, where the different teaching methodologies and the professors' expertise play an important role, since it would enhance the characteristics that are sought in a professional with this profile.

It is confirmed that the CMI is an evaluation tool that is adapted to different types of organizations, and in turn, to different training processes that can be measured from this instrument. It should be noted that the objectives and the different perspectives presented in this study may vary according to the objectives of certain courses. That is, if it is not essential to carry out a business intervention in the development of the course, the entrepreneur's perspective can be modified by another one that the professor considers appropriate, or simply ignored it in the development of the evaluation of the training process.

A significant step for improvement in terms of the quality of higher education is evident, to train comprehensive and trained professionals to assume and face the challenges of the world of work. This shows the positive response of the hypothesis that was contemplated at the beginning of the research. A course involving all its participants can be evaluated in a systematic and holistic way.

It should be noted that this design will be applied to other professional career courses to give validity and consistency to the instruments presented here, and that, subsequently, according to results, the number of courses in the program that adopt this type of monitoring can be increased. Starting from the premise, that continuous improvement is a basic principle of all companies, then it should be a basic principle in the educational sector, especially in those that make up the country's next businessmen.

## 6. Conflict of interest

The authors declare no conflict of interest.

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