

# An Assessment Strategy to Assess Professional Competencies: A Case Study of the Civil Industrial Engineering Career of the Universidad Tecnológica Metropolitana of Chile

*Óscar Antonio Barrios Ríos, Montserrat Andrea Méndez Tapia*  
(Universidad Tecnológica Metropolitana, Chile)

**Abstract:** The study is based on a case study focused on the Industrial Civil Engineering career taught at the Metropolitan Technological University of Chile (UTEM). The study is based on the students' self-evaluation of the competences achieved in the fifth year of the career, specifically in the "Project Evaluation Workshop" subject. It is applied an assessment strategy previously developed and validated. The results of the self-assessment are analyzed for each competency that the students must have achieved at that level of their professional training and then the results are compared with the evaluations made by the teacher of the same subject.

**Key words:** assessment, competence, vocational training, strategy, formative evaluation

## 1. Introduction

An operational definition of assessment is the process of obtaining, organizing and presenting varied information about what the student learns and how he learns it, through the use of different techniques and at different times during the teaching-learning process. The information obtained is used to improve the teaching process and to validate if the learning achievements of the course or program, if they are being accomplished and how, and to inform improvement decisions.

The Metropolitan Technological University has defined Assessment as a periodic self-evaluation, based on methodical reflection and the analysis of different criteria and indicators, established by the University, which provides information to undergraduate and graduate programs and careers to make judgments on the quality of its academic management, detect improvement niches and formulate and implement remedial actions.

### 1.1 Identification of Factors Involved in the Process

#### 1.1.1 Leadership

It is important to have adequate leadership to guarantee the implementation of the assessment process and that this, in turn, is carried out periodically and permanently within the career. Therefore, the School Director or Head of Career must motivate the group of teachers, explaining the purpose and importance of the evaluation, so that they

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Óscar Barrios Ríos, Ph.D., Universidad Tecnológica Metropolitana de Chile; research areas: education sciences. E-mail: [obarrios@utem.cl](mailto:obarrios@utem.cl).

Montserrat Méndez Tapia, Master, Industrial Civil Engineer, Universidad Tecnológica Metropolitana de Chile; research areas: management and leadership in educational management. E-mail: [mmendez@utem.cl](mailto:mmendez@utem.cl).

actively participate in the process and share their results and experience with other members of the academic unit. In addition, it is crucial that the leader analyze the results of the process in order to capture remedies that focus on continuous career improvement.

#### **1.1.2 Assessment of Learning Achievement**

The objective of assessment for a career is to provide a conceptualization of the expected learning outcomes to be achieved by students, a description of how results are assessed and measured, a description of the results obtained, and a description of how these results validate current practices or point out the changes necessary to improve student learning.

#### **1.1.3 Training Process**

The training process is made up of a set of actions and interactions that are generated, intentionally and planned, between different agents and/or components to achieve the objectives and purposes proposed in this process. For this reason, this process must be evaluated periodically, in order to guarantee its continuous improvement based on the assessment and timely decision-making to solve the detected weaknesses or problems.

### **1.2 A management Strategy That Is Consistent With The Assessment Process**

#### **1.2.1 Management Strategy: Assessment Cycle**

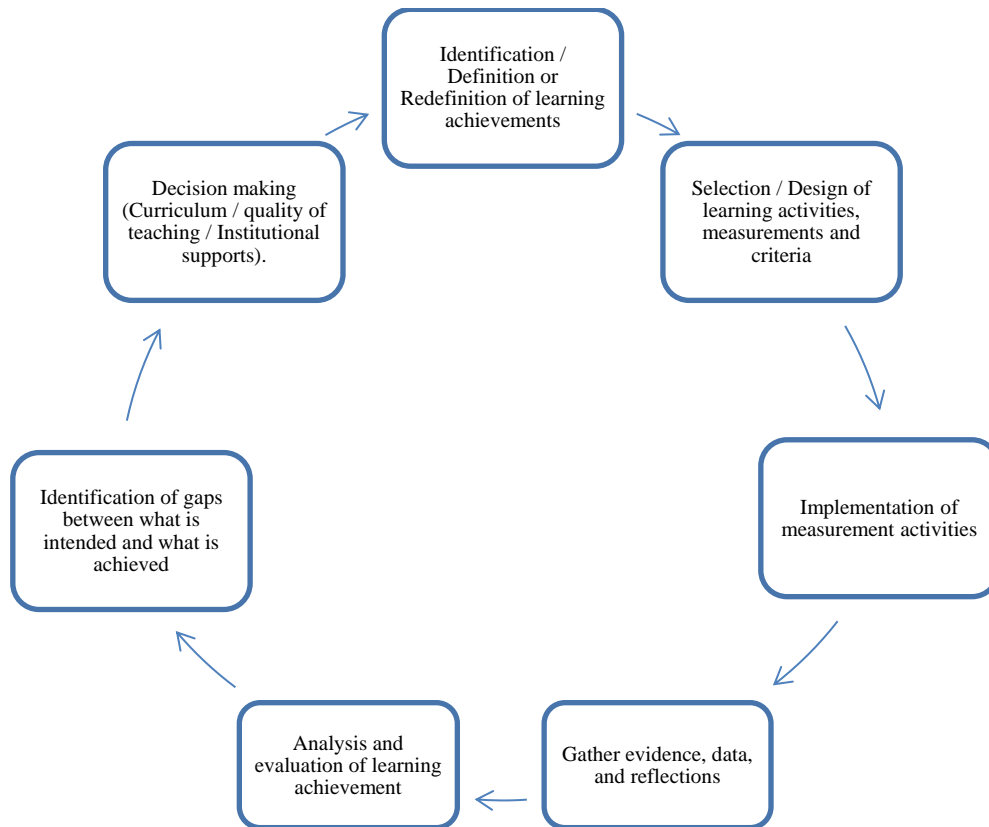
To implement an assessment process, it is necessary to establish a quality management model, which is a frame of reference to execute and administer the process in a given academic unit. The management model of an assessment process is based on a continuous improvement cycle, since the execution must be permanent.

The accreditation process in Chile recognizes the totality of the dimensions of a higher education institution and requires, to some extent, to generate management and evaluation mechanisms at the institutional level to monitor and fulfill the learning outcomes of the students. It must be recognized that the assessment process is much more than an evaluation technique, its purpose aims to present evidence of the evaluation of the training process and how the results obtained are the basis for a process of continuous improvement.

Careers or academic programs must constantly ask themselves: What should students know, do, and appreciate, and how do we know that students are achieving the intended learning outcomes? After implementing an assessment plan and measuring student learning outcomes, careers, programs, and academic units should analyze the results obtained and use those results to make any necessary changes or improvements to the career or program.

It is important to have the appropriate structure to ensure that the assessment process and that once implemented, it is self-sufficient, where the team understands the purpose and importance of the assessment and are willing to share their knowledge, experience and interest in the assessment with other members of the academic unit. Likewise, academic action and the evaluation process become part of the culture of the University, that professors participate in evaluation procedures, agree on the importance of learning results and ways to evaluate these results.

For the Assessment Management Model, the Malcolm Baldrige Quality Model was carried out, since this model focuses on quality circles, considering essential elements such as leadership, strategic planning and customer and market orientation. Therefore, the management model is adapting the continuous improvement cycle associated with each of the components that comprise the assessment process, such as: Identification, Definition or Redefinition of learning achievements, Selection/Design of learning activities, measurements and criteria, Implementation of measurement activities, Gather evidence, data and reflections, Analysis and evaluation of evidence (learning achievements), Identification of gaps between what is intended and what is achieved and Decision making (Quality of Teaching, Quality of the curriculum, Quality of institutional supports).



**Figure 1** Assessment Cycle

### 1.2.2 Phases of the Assessment Cycle

Phase 1: Clearly define and identify the learning outcomes and skills to be assessed.

Each career or program must be clear about the learning achievements that students must achieve, be able to do (skills), know (knowledge) and appreciate (values and attitudes) after completing each course or curricular activity of the career or program.

Phase 2: Select the appropriate evaluation devices to evaluate the learning results and competences achieved.

Usually, multiple ways of evaluating learning outcomes are selected and used. Direct and indirect procedures can be applied to evaluate learning outcomes, it is generally recommended to focus on direct procedures. Student achievement levels for each learning outcome are often described and evaluated with rubrics.

It is important to determine how the data will be collected and who will be responsible for the data collection. The results are reported without names to protect the confidentiality of the evaluated students.

Phase 3: Analyze the learning outcomes and assessed competences.

It is important to analyze and report evaluation results in a meaningful way. A small group of academics would be ideally responsible for this function with support from the Pre and Postgraduate Quality Assurance Directorate.

Phase 4: Adjustment or improvement of the programs according to the assessment

The information obtained in the evaluation is of no value if it is not used. This phase is critical to the evaluation process. The evaluation process is not relevant if the results do not lead to adjustments or improvement in careers and programs. Assessment results should be widely disseminated to academics to obtain their opinion on how to improve careers and programs from the assessment results. In some cases, the changes will be minor and easy to

implement. In other cases, substantial changes will be necessary and recommended and may require more time to be implemented.

## 2. Methodology

### 2.1 Analysis of the Graduation Profile and the Evaluated Subject

The subject is related to the graduation profile through its learning results, which pay:

Domain “Evaluation and Development of Systems and Organizational Processes” (D2)

Competition “Formulates and evaluates investment projects to support the organization’s decision making with an attitude prone to improvement, entrepreneurship and innovation” (C3).

This course contributes to the development of the generic competence “Collaborative work and in multidisciplinary environments” (CG3) at level 3 “Works collaboratively in multidisciplinary teams demonstrating social skills to achieve projects in different contexts”.

### 2.2 Subject Description

It is a compulsory theoretical and practical subject that is taught in the eleventh semester and belongs to the Specialization Cycle.

At the end of the course:

Students must be able to apply specific tools oriented to formulate projects and lead necessary teams to evaluate, technically and economically, strategies, programs and projects.

Students must be able to develop innovative solution options, detect market opportunities and make investment decisions.

The course consists of four units:

- Introduction to the Project Workshop,
- Preparation and Definition of the Draft,
- Preliminary Preparation and Preparation of the Project,
- Preparation and Final Preparation of the Project.

### 2.3 Specific Data of the Subject Program

**Table 1 Subject Program**

1.1	Name	Project Evaluation Workshop				
1.2	Code	INDB8111	Type of subject		Mandatory	
1.3	Requirement	9º Approved Semester				
1.4	SCT	6	Modality		Face-to-face	
1.5	Weekly pedagogical hours	Classroom			Extra classroom	Total hours
		Theory	Workshop	Laboratory		
		4	2	0		
1.6	Training cycle or program	Specialization Cycle				
1.7	Department	Industry				
1.8	Valid since	March 2019		Study Plan Code		21076

### 2.4 Assessment Instrument

The design of the evaluation instrument was carried out based on a matrix with the learning results of the

competence being evaluated, based on the study program of the subject “Self-evaluation of the Project Evaluation Workshop” of the Civil Industrial Engineering Degree.

**Table 2 Matrix With Learning Outcomes**

Competences to which it is taxed	Learning out comes	Evaluation procedures and /or techniques
Professional Competence C3: Formulates and evaluates investment projects to support the organization's decision making with an attitude prone to improvement, entrepreneurship and innovation	-Apply theoretical and methodological concepts in case analysis and practical experiences in project preparation and evaluation. -Develop a situation or a real case, in which the evaluation of a business and the development of a new investment project is carried out.	- 2 controls (20%). - 1 or 2 written tests (40%). - 1 practical group work with oral presentation (40%).
CG3 competence, level 3: Work collaboratively in multidisciplinary teams demonstrating social skills to achieve projects in different contexts.	- Lead disciplinary and/or interdisciplinary work teams for the development of common projects demonstrating leadership and negotiation skills. - Evaluates the usefulness of the actions, as well as the achievements and products of collaborative work, identifying the critical knots needed to be overcome to optimize their results.	Rubric for practical work and oral presentations, the learning achievements of the generic competence will be evaluated, with a weighting of 50%.

## 2.5 Two Rubrics Were Developed

A rubric to evaluate the learning result: “Apply theoretical and methodological concepts in case analysis and practical experiences in project preparation and evaluation.” This rubric considers 7 performance criteria with 4 performance levels.

A second rubric to evaluate the learning outcome: “Develop a situation or a real case, in which the evaluation of a business and the development of a new investment project is carried out.” This rubric considers 4 performance criteria with 4 performance levels.

**Table 3 Rubric No. 1**

Criteria of performance	Consideration	Performance levels			
		Sufficient	Good	Very Good	Outstanding
<b>External and internal analysis</b>	10%	I can apply at least one important element to carry out a Market Study. (PEST/PESTAL, Porter's forces, value chain, SWOT analysis).	I can apply two important elements to carry out a Market Study. (PEST/PESTAL, Porter's forces, value chain, SWOT analysis).	I can apply all the important elements to carry out a Market Study. (PEST/PESTAL, Porter's forces, value chain, SWOT analysis).	I can efficiently apply all the important elements to carry out a Market Study. (PEST/PESTAL, Porter's forces, value chain, SWOT analysis).
<b>Segmentation</b>	10%	I identify with difficulty the theoretical process of market segmentation.	I partially identify the theoretical process of market segmentation.	I identify the theoretical process of market segmentation.	I identify and can support the theoretical process of market segmentation.
<b>Technical and organizational study</b>	10%	I can identify an element to carry out a technical and organizational study.	I can identify the elements to carry out a technical and organizational study.	I can partially carry out a technical and organizational study.	I can correctly carry out a technical and organizational study.
<b>Economic and financial study</b>	10%	I identify with difficulty the elements to carry out an economic and financial study.	I partially identify the elements to carry out an economic and financial study.	I identify the elements to carry out an economic and financial study.	I correctly identify the elements to carry out an economic and financial study.
<b>Market study techniques and methods</b>	20%	I can apply with difficulty the techniques and methods to carry out a market study.	I can partially apply the techniques and methods to carry out a market study.	I can apply the techniques and methods to carry out a market study.	I can apply and base the techniques and methods to carry out a market study.

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<b>Techniques and methods of the technical and organizational study</b>	15%	I can apply with difficulty the techniques and methods to carry out a technical and organizational study.	I can partially apply the techniques and methods to carry out a technical and organizational study.	I can apply the techniques and methods in a systematic way to carry out a technical and organizational study.	I can correctly apply the techniques and methods in a systematic way to carry out a technical and organizational study.
<b>Techniques and methods of the economic and financial study</b>	25%	I can apply with difficulty the techniques and methods to carry out an economic and financial study.	I can partially apply the techniques and methods to carry out an economic and financial study.	I can apply the techniques and methods in a systematic way to carry out an economic and financial study.	I can correctly apply the techniques and methods in a systematic way to carry out an economic and financial study.

**Table 4 Rubric No. 2**

Criteria of performance	Consideration	Performance levels			
		Sufficient	Good	Very good	Outstanding
<b>Contextualization of the project idea</b>	25%	I can contextualize with help the need for the socio-community	I can autonomously contextualize the need for the socio-community	I can contextualize autonomously, but not clearly and precisely, the need for the socio-community	I can independently, clearly and precisely contextualize the need for the socio-community
<b>Development of the market study</b>	25%	I can apply with difficulty the techniques and methods to carry out a market study.	I can partially apply the techniques and methods to carry out a market study.	I can apply the techniques and methods correctly to carry out a market study.	I can apply the techniques and methods to optimally carry out a market study.
<b>Development of the technical and organizational study</b>	25%	I can apply with difficulty the techniques and methods to carry out a technical and organizational study.	I can partially apply the techniques and methods to carry out a technical and organizational study.	I can apply the techniques and methods correctly to carry out a technical and organizational study.	I can apply the techniques and methods optimally to carry out a technical and organizational study.
<b>Development of the economic and financial study</b>	25%	I can apply with difficulty the techniques and methods to carry out an economic and financial study.	I can partially apply the techniques and methods to carry out an economic and financial study.	I can apply the techniques and methods correctly to carry out an economic and financial study.	I can apply the techniques and methods optimally to carry out an economic and financial study.

**Table 5 Equivalence: Performance Levels/Rating Scale of 1–7**

Performance levels	Rating
Outstanding	7
Very good	6
Good	5
Adequate or approval	4

## 2.6 Sample Characterization

The unit of analysis are the students who take the ninth semester in the subject of “Project Evaluation Workshop” of the Industrial Civil Engineering Career.

An intentional, non-probabilistic sample was used, the decision was made to select two sections of students from the same course subject, as it was a subject that was at the end of the course and at that level of training the student must have acquired certain skills of the graduation profile.

**Table 6 Sample of Students**

Section	Number of students
Section 1	30
Section 2	15
Total students	45

From the total of selected students, the following percentages can be seen in the graph according to their cohort. 32% correspond to the students of the 2013 cohort, 63% correspond to the students of the 2014 cohort, 4% correspond to the students of the 2016 cohort (student who switched to the career and re-entry) 1% corresponds to the 2019 cohort (2013 entry to Industrial Civil Engineering, then abandonment and re-entry)

The group of students averages a grade of 6.0 in the subject Project Evaluation Workshop.

### 3. Results

The results of the administration of the two rubrics applied to the 45 students of the two sections of the ninth semester of the Industrial Civil Engineering Career are presented, in the subject of Project Evaluation Workshop.

The information of the students' self-evaluation through the rubrics, is presented:

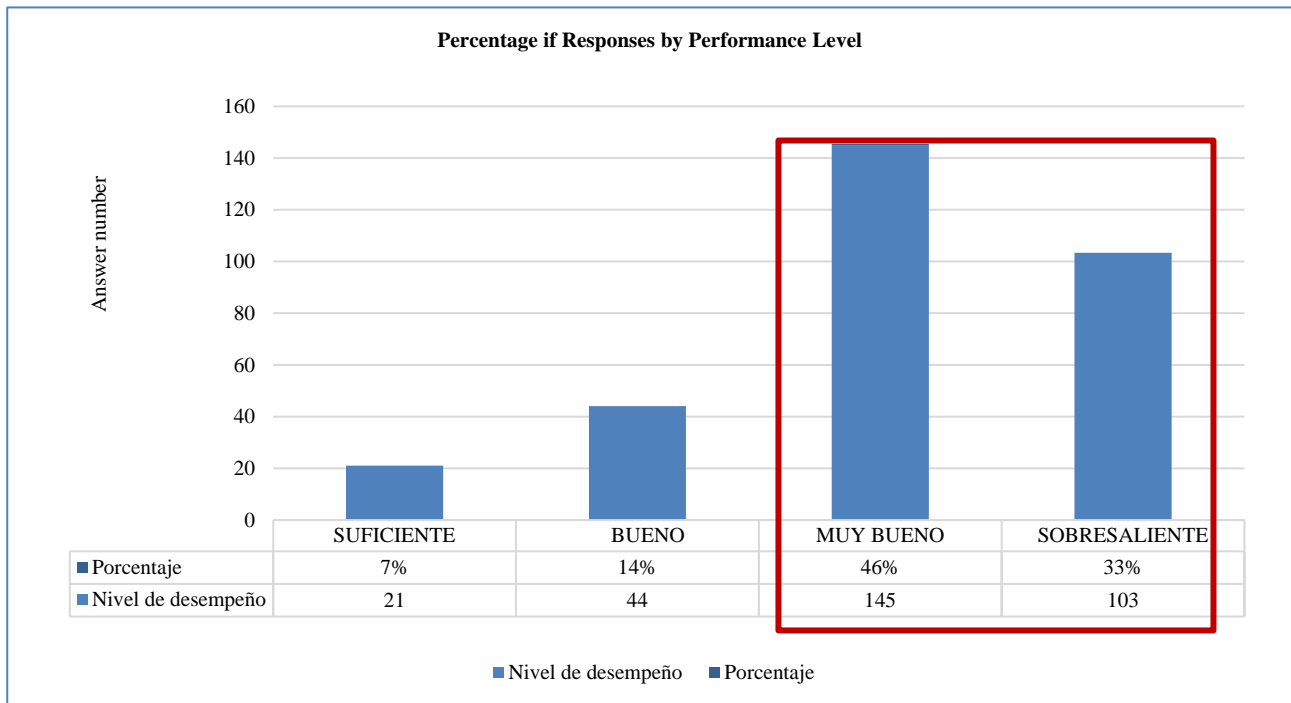
- a) Summary Table
- b) General Response Chart
- c) Comments

**Table 7 Summary of responses Rubric No. 1**

Criteria of performance	Consideration	Performance levels				
		Adequate	Good	Very good	Outstanding	Total
External and internal analysis	10%	1	6	19	19	45
Segmentation	10%	1	4	20	20	45
Technical and organizational study.	10%	1	4	21	19	45
Economic and financial study.	10%	6	8	19	12	45
Market study techniques and methods.	20%	1	6	24	13	44
Techniques and methods of the technical and organizational study.	15%	4	7	23	11	45
Techniques and methods of the economic and financial study.	25%	7	9	19	9	44
Total	100%	21	44	145	103	313

Figure 2 represents the number of student responses and the levels of performance achieved. As observed, 7% of the responses are at a sufficient level, equivalent to the 4.0 rating. 14% of the students' answers are in a good level, equivalent to the 5.0 grade. 46% of the students' answers are at the very good level, equivalent to grade 6.0 and 33% of the students' answers are at the outstanding level, equivalent to grade 7.0.

46%, which represents the highest concentration of student responses, is at a very good performance level, equivalent to grade 6.0, which allows us to infer that a high number of students in the two sections have achieved the competition: Formula and evaluates investment projects to support the organization's decision making with an attitude prone to improvement, entrepreneurship and innovation.



**Figure 2 General Response Chart Heading No. 1**

Only two students indicate that they do not achieve the sufficient level due to “lack of economic base”.

Comments made by students:

- 1) “I actively participated in the analysis and segmentation, leaving the studies as a weakness, but I still defend myself.
- 2) Deficiencies in finance concepts.
- 3) I feel very weak in sensitivity analysis.
- 4) Generally, I find difficulties in financial studies and making concepts. Lacking some practice in that area and try to gradually incorporate in most cases that can be used to internalize that technique more deeply.
- 5) At the level of performance, it is not outstanding, since in terms of feedback there is a shortage, only in the evaluation workshop did the feedback participate, so I have no way of knowing if the exercises carried out in other branches of the applied techniques were correct.
- 6) The specialty classes are not taught; accordingly, teachers do not respect the class blocks. The last semester classes should be applied earlier.
- 7) Depending on the type of clinic, I can vary the identification of the segment.
- 8) Lack of commitment in the evaluation subjects or workshop, by the professor in charge of INGECO and Project Evaluation as such.
- 9) In my opinion, the teaching methodology of the subjects developed throughout the last years of my career was correct, since the delivery of knowledge of the different aspects necessary to carry out all the pertinent studies was partially carried out when evaluating a project.
- 10) I think that the contents aimed at economic study should be promoted.
- 11) My performance in the economic and financial study is low, there is no clarity in concepts, analysis and calculation.



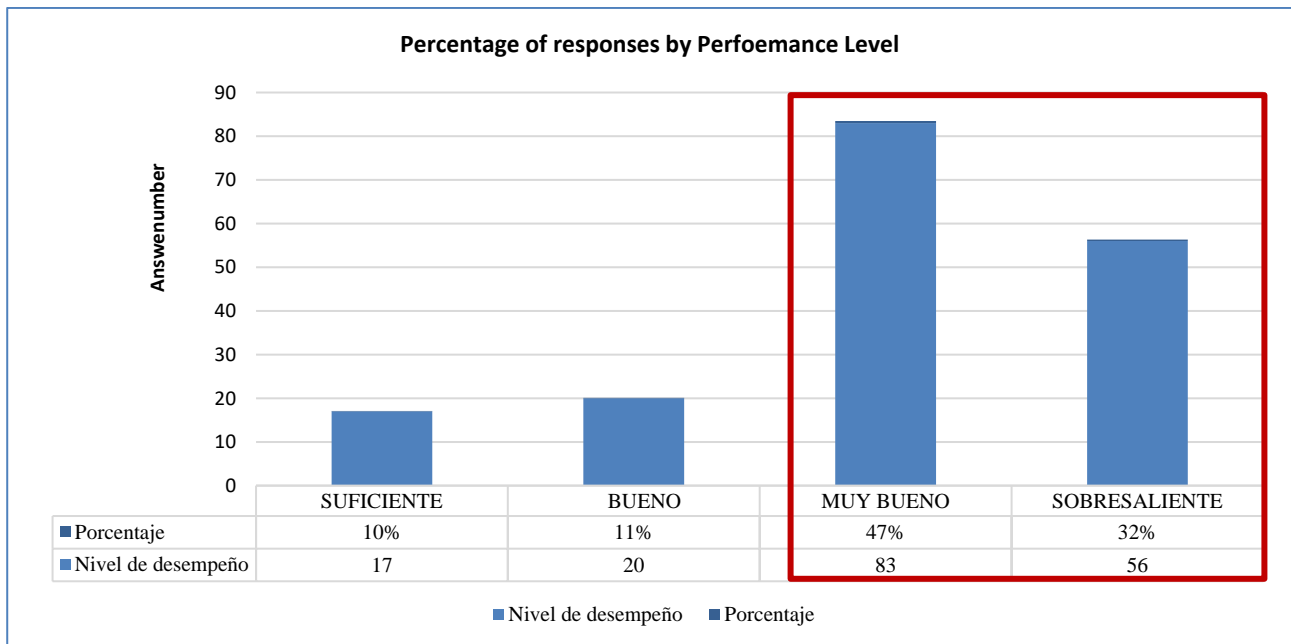
- 12) Weaknesses are identified in some financial concepts associated with the methodologies used. Sensitivity analysis.
- 13) The lowest or unknown point was the organizational study, as well as the value chain. Rubric: The problem statement lacks advice from the teacher to clarify our scope as students and the purposes of the field to the employer.

**Table 8 Summary of responses Heading No. 2**

Criteria of performance	Consideration	Performance standards				
		Adequate	Good	Very good	Outstanding	Total
Contextualization of the project idea	25%	1	4	15	24	44
Development of the Market Study.	25%	4	3	23	14	44
Development of the technical and organizational study.	25%	2	7	25	10	44
Development of the economic and financial study.	25%	10	6	20	8	44
Total	100%	17	20	83	56	176

Figure 3 shows the number of student responses and the levels of performance achieved. It is observed that 10% of the answers are at a sufficient level, equivalent to the 4.0 rating. 11% of the students' responses are at a good level, equivalent to the 5.0 grade. 47% of the students' answers are at the very good level, equivalent to grade 6.0, and 32% of the students' answers are at the outstanding level, equivalent to grade 7.0.

Figure 3 shows that the 47% representing the highest number of student responses are at a very good level of performance, which is equivalent to grade 6.0, inferring that the "Formulates and evaluates investment projects to support decision-making" was acquired. of decisions of the organization with an attitude prone to improvement, entrepreneurship and innovation.



**Figure 3 General Response Chart**

Comments made by students:

- 1) "I think that the use of computer tools and platforms of this type is content in which the university is very much in charge with the degree. In fields like secure operations research, using a software from the 90s. Well it helps to understand the content is not very relevant to the future work.
- 2) there is a lack of clarity in the project on the part of the entrepreneur, because half of the project exposes the idea of changing the approach.
- 3) Business clinics are very good to know the strengths and weaknesses of knowledge, in my case I present facilities in the technical study, but difficulties in the financial aspect.
- 4) There is great mistrust in the economic and financial sphere.
- 5) The field of economic engineering class does not give the necessary tools for an applied future. Emphasize classes that are used in practice.
- 6) Personally, I have difficulty developing some financial topics.
- 7) Some type of commission is needed that interacts frequently with the companies of the clinic and thus facilitate communication, objectives and scope.
- 8) The clinics developed by the university are an excellent method of incorporation into real cases, which collaborates with present and future work, due to the different values necessary for their development.
- 9) Lack of clinical commitment is made since the development of the aforementioned studies is difficult.
- 10) I could appreciate, that at the time of making the document, that there is a lot of confusion of concepts and their calculations.
- 11) Necessary improvements: Finance and logistics
- 12) In the performance a high level is reached, but there are small weaknesses in the economic field".

#### 4. Analysis of the Results

In the data analysis, they were disaggregated by rubric and by each disciplinary criterion that was determined in which the students should have reached a certain level of performance.

Each criterion is represented in a bar graph and the results obtained from the students' self-evaluation are described.

The students' self-evaluations are presented and described for each criterion that they were evaluated, indicating the highest concentration of student responses.

##### 4.1 Specific Graphics by Criterion

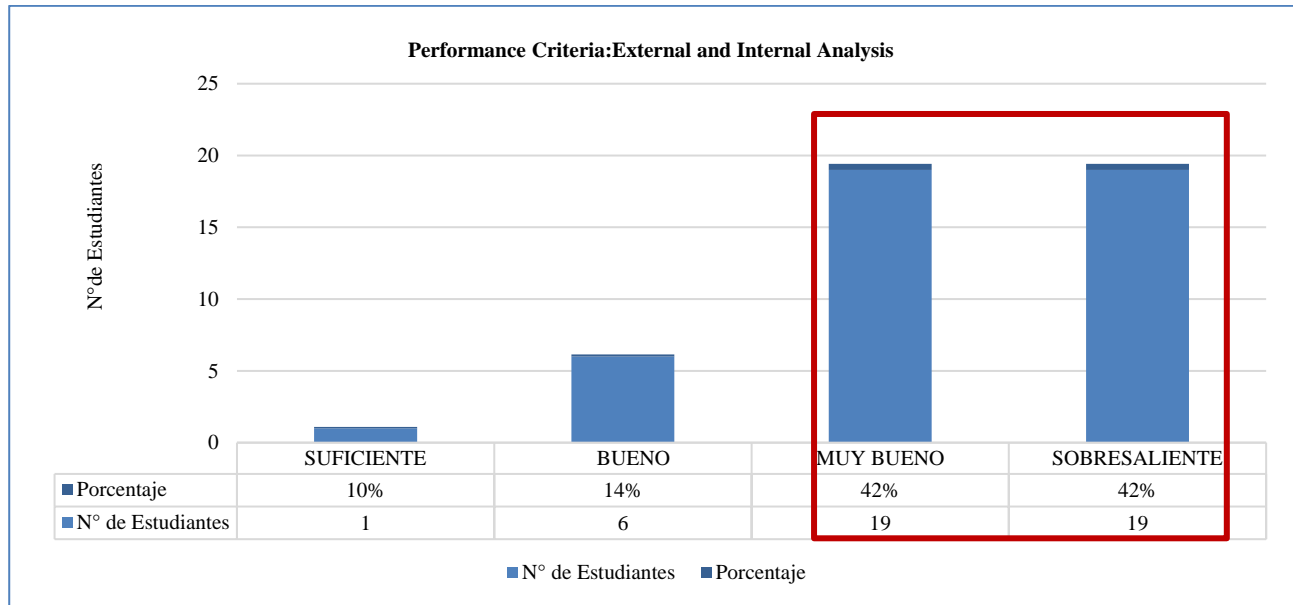
In Figure 4 it represents the specific criterion of "External and internal analysis" in relation to the number of students and the level of performance that indicates having achieved.

It is noted:

- 10% of students are at a sufficient level, equivalent to a 4.0 grade.
- 14% of students are at a good level, equivalent to a 5.0 grade.
- 42% of students are at very good level, equivalent to a 6.0 grade.
- 42% of the students are at the proficient level, equivalent to a 7.0 grade.

84% of students self-evaluate at very good and outstanding performance levels, corresponding to grades 6.0 and 7.0, which means that students are able to efficiently apply all the important elements to carry out a market study. (PEST/PESTAL, 5 Porter's Forces, Value Chain, SWOT Analysis). However, there is dispersion of responses

across the four performance levels.

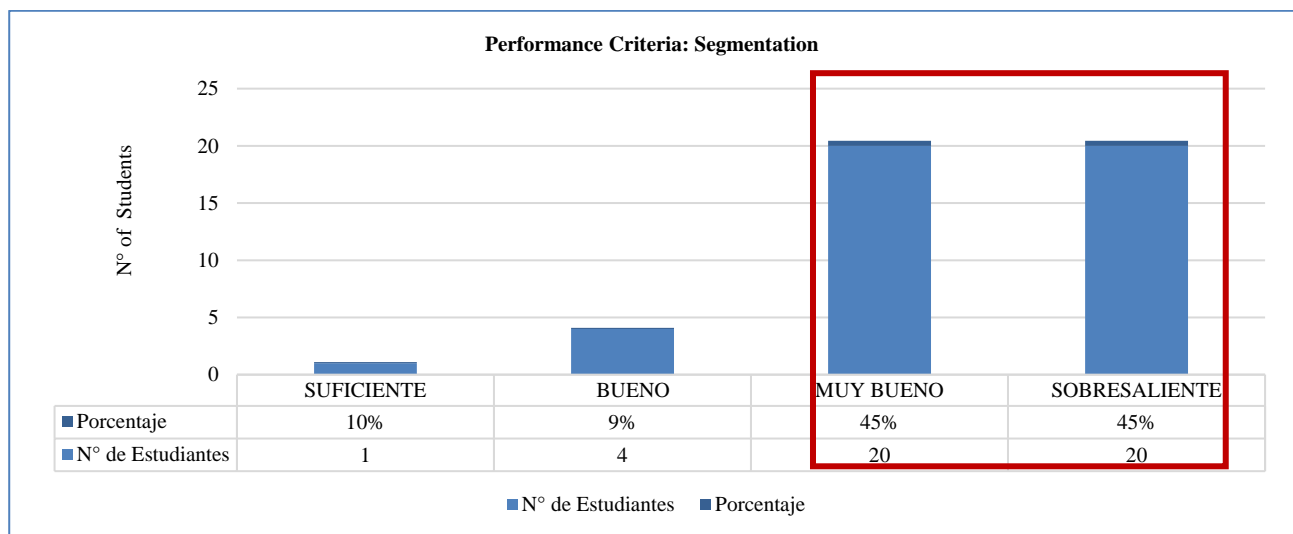


**Figure 4 Performance Criterion “External and Internal Analysis”**

Figure 5 represents the specific criterion “Segmentation” in relation to the number of students and level of performance achieved, it is observed:

- 10% of students are at sufficient level, equivalent to a 4.0 grade.
- 9% of the students are in a good level, equivalent to a 5.0 grade.
- 45% of students are at very good level, equivalent to a 6.0 grade.
- 45% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 5 shows that 90% of the students have very good and outstanding performance levels, grades 6.0 and 7.0, which means that they identify and are able to support the theoretical process of market segmentation. However, there is dispersion of responses across the four performance levels.



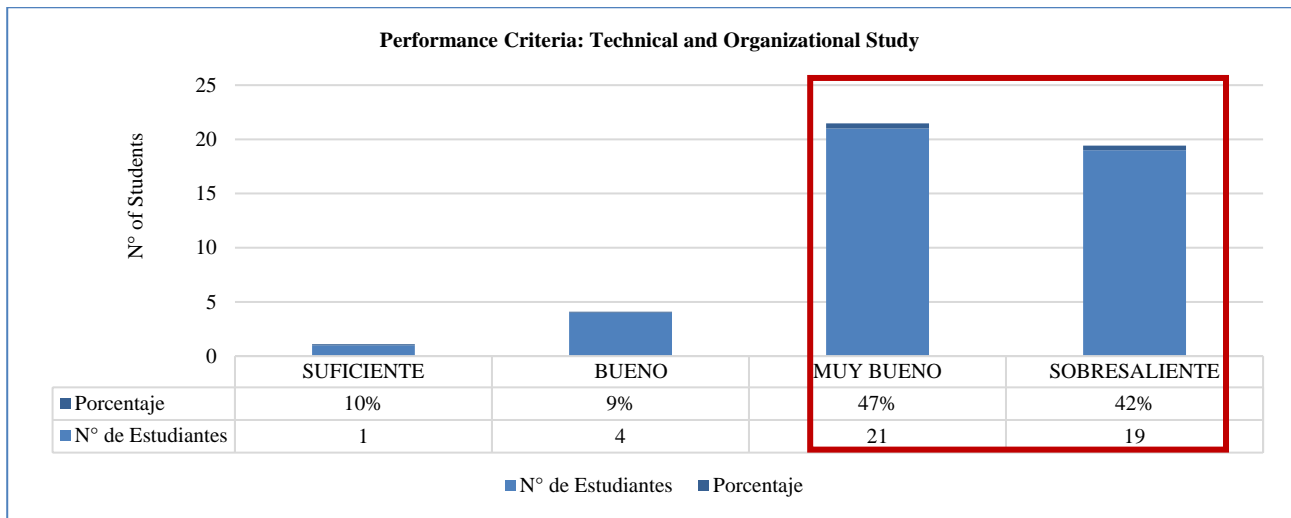
**Figure 5 Performance Criterion “Segmentation”**

Figure 6 represents the specific criterion “Technical and Organizational Study” in relation to the number of students and level of performance achieved.

It is noted:

- 10% of students are at sufficient level, equivalent to a 4.0 grade
- 9% of the students are in a good level, equivalent to a 5.0 grade
- 47% of students are at the very good level, equivalent to a 6.0 grade
- 42% of the students are at the proficient level, equivalent to a 7.0 grade

Figure 6 shows that 89% of the students have a very good and outstanding performance level, grades 6.0 and 7.0, which means that the students are able to carry out a technical and organizational study correctly. However, there is dispersion of responses across the four performance levels.



**Figure 6 Performance criteria “Technical and Organizational Study”**

Figure 7 represents the specific criterion “Economic and Financial Study” in relation to the number of students and the level of performance achieved.

It is noted:

- 13% of students are at a sufficient level, equivalent to a 4.0 grade
- 18% of the students are in a good level, equivalent to a 5.0 grade.
- 42% of the students are at the very good level, equivalent to a 6.0 grade
- 27% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 7 shows that 42% of the students have a very good level of performance, equivalent to a 6.0 grade, which means that the students correctly identify the elements to carry out an economic and financial study. However, there is dispersion of responses across the four performance levels.

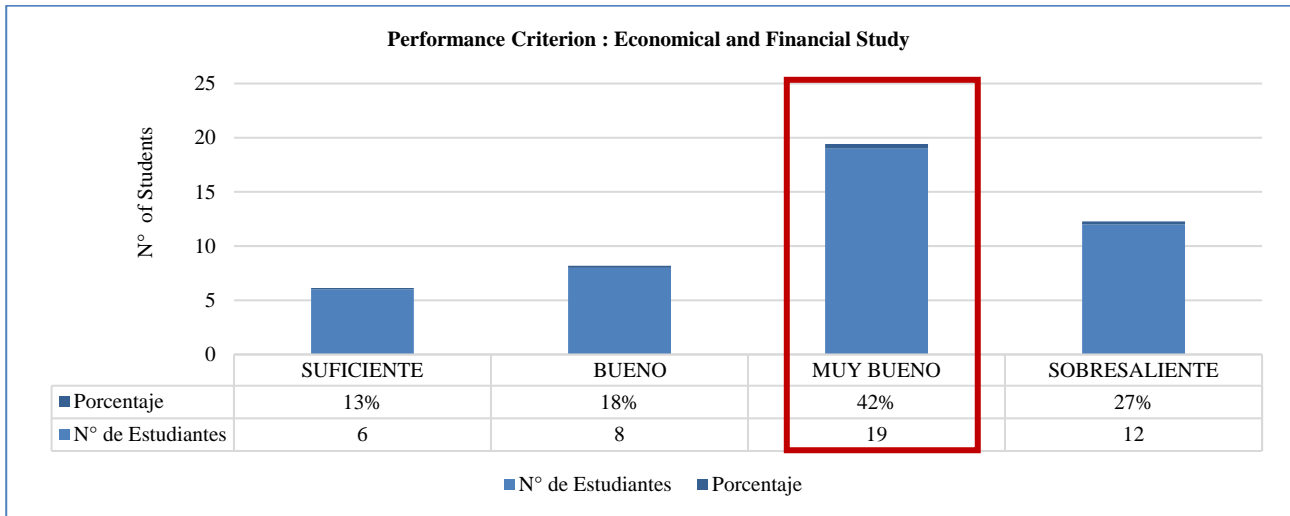
Figure 8 represents the specific criterion “Techniques and Methods of Market Research” in relation to the number of students and level of performance achieved.

It is noted:

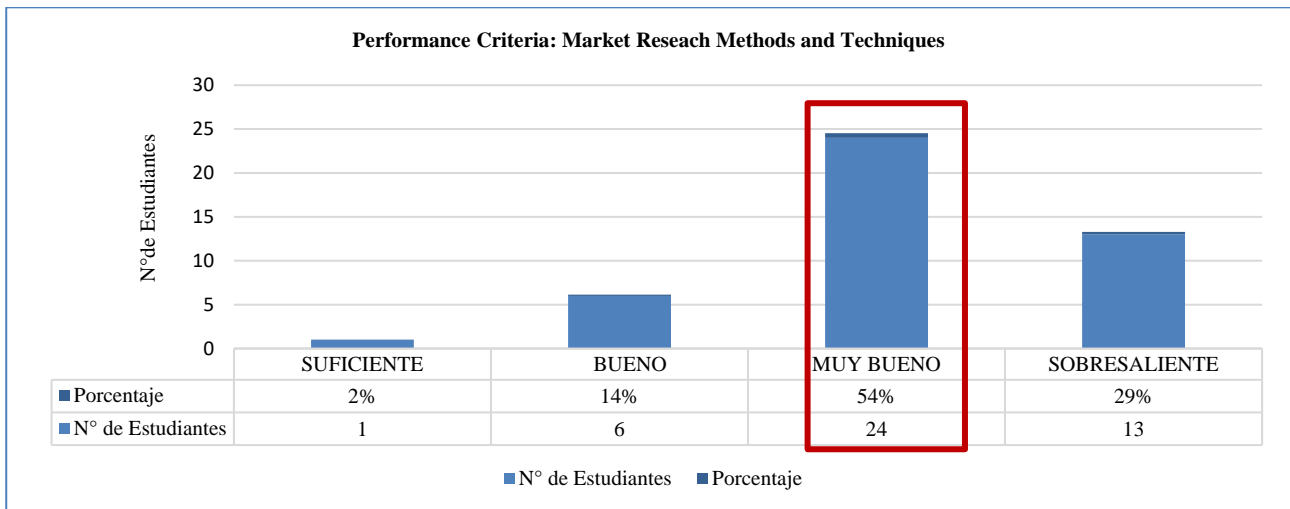
- 2% of students are at sufficient level, equivalent to a 4.0 grade.
- 14% of students are at a good level, equivalent to a 5.0 grade.
- 54% of the students are in the very good level, equivalent to a 6.0 grade.

- 29% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 8 shows that 54% of the students have a very good level of performance, equivalent to the 6.0 grade, which means, that the students are able to apply and substantiate the techniques and methods for conducting market research. However, there is dispersion of responses in the four levels of performance.



**Figure 7 Performance Criterion “Economic and Financial Study”**



**Figure 8 Performance Criterion “Techniques and Methods of the Market Study”**

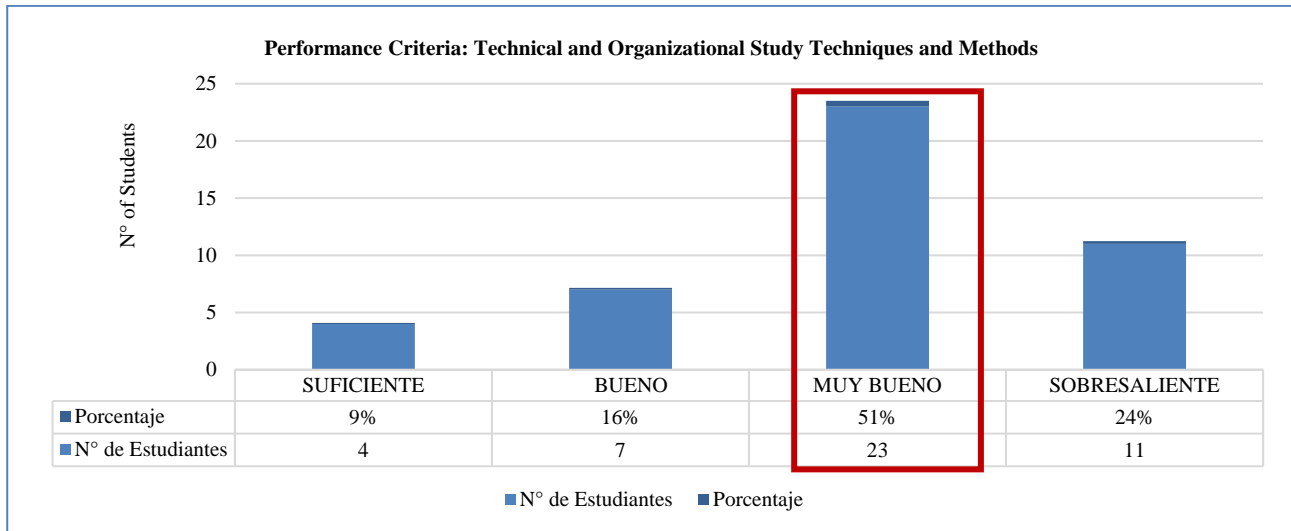
Figure 9 represents the specific criterion “Techniques and Methods of Technical and Organizational Study” in relation to the number of students and level of performance achieved.

It is noted:

- 9% of students are at sufficient level, equivalent to a 4.0 grade
- 16% of students are at a good level, equivalent to a 5.0 grade
- 51% of the students are at the very good level, equivalent to a 6.0 grade
- 24% of the students are at the proficient level, equivalent to a 7.0 grade

Figure 9 shows that 51% of the students have a very good level of performance, equivalent to the 6.0 grade, which means that the students are to apply the techniques and methods in a systematic way to carry out a technical

and organizational study. However, there is dispersion of responses across the four performance levels.



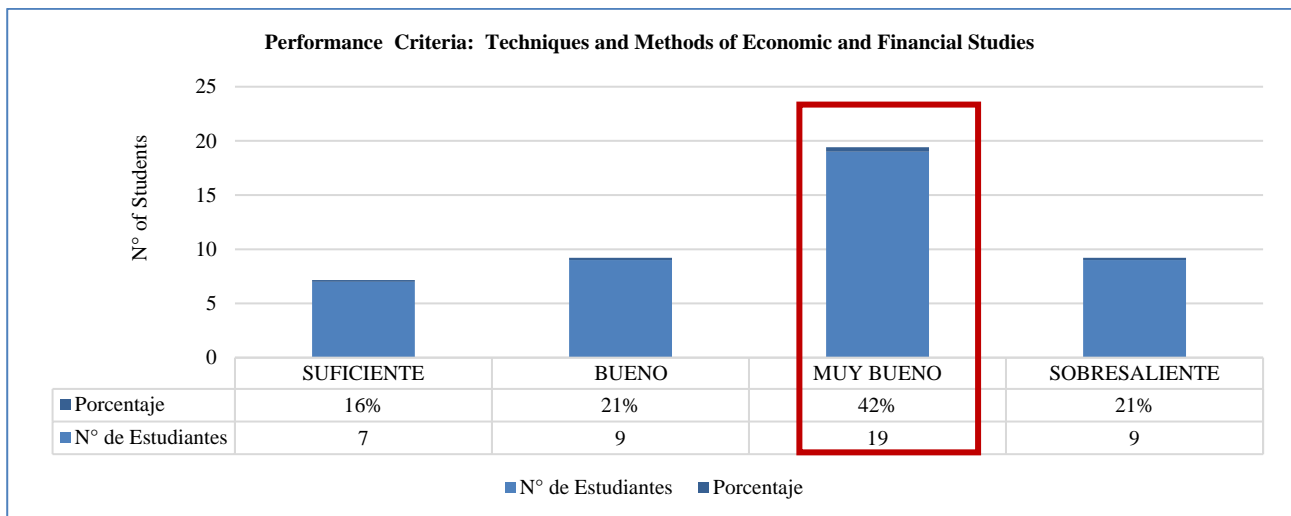
**Figure 9 Performance Criteria: Techniques and Methods of Technical and Organizational Study**

Figure 10 represents the specific criterion “Technical and Organizational Study” in relation to the number of students and the level of performance achieved.

It is noted:

- 16% of students are at an adequate level, equivalent to grade 4.0.
- 21% of the students are in a good level, equivalent to the 5.0 grade.
- 42% of the students are at the very good level, equivalent to grade 6.0.
- 21% of the students are in the outstanding level, equivalent to grade 7.0.

Figure 10 shows that the 42% representing the majority of the students have a very good level of performance, equivalent to the 6.0 grade, which means that the students are able to correctly apply the techniques and methods systematically to carry out a study. economic and financial. However, there is dispersion of responses across the four performance levels.



**Figure 10 Performance Criteria “Techniques and Methods of Economic and Financial Study”**

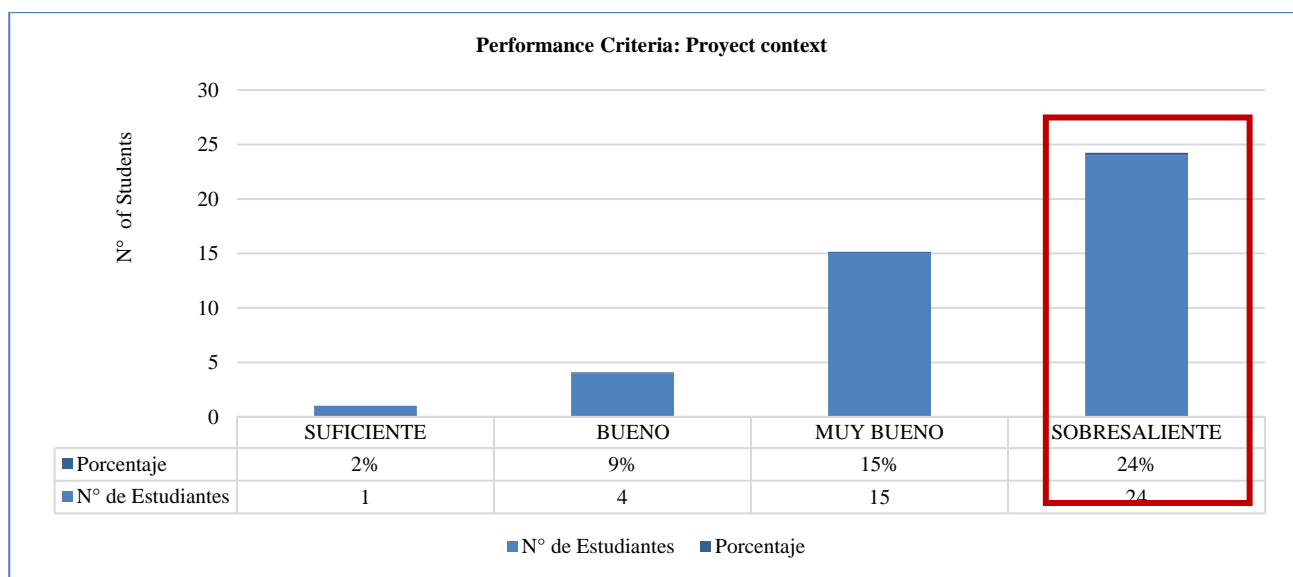
## 4.2 Specific Graphics by Criterion

Figure 11 represents the specific criterion of the “Project Contextualization” in relation to the number of students and the level of performance achieved.

It is noted:

- 2% of students are at an adequate level equivalent to grade 4.0.
- 9% of the students are in a good level, equivalent to the grade 5.0.
- 15% of the students are at the very good level, equivalent to grade 6.0.
- 24% of the students are in the outstanding level, equivalent to grade 7.0.

Figure 11 shows that 24%, almost a quarter of the students, have an outstanding level of performance, equivalent to grade 7.0, which means that students are able to contextualize autonomously, clearly and precisely the need of socio-community. However, there is dispersion of responses across the four performance levels.



**Figure 11 Performance criteria: Project contextualization**

Figure 12 it represents the specific criterion of the “development of the market study” in relation to the number of students and the level of performance achieved.

It is noted:

- 9% of students are at sufficient level, equivalent to 4.0 grade.
- 7% of the students are in a good level, equivalent to a 5.0 grade.
- 52% of students are at very good level, equivalent to a 6.0 grade.
- 32% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 12 shows that 52% of the students have a very good level of performance, equivalent to the 6.0 grade, which means that the students are able to apply the techniques and methods to optimally carry out a Market Study. However, there is dispersion of responses across the four performance levels.

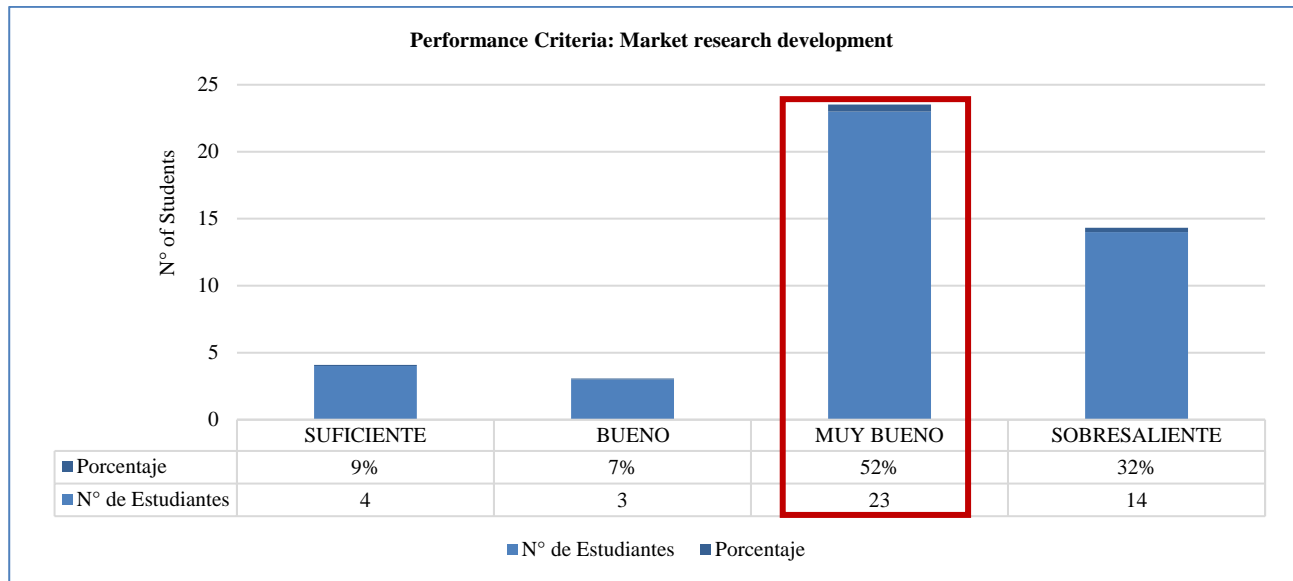
Figure 13 represents the specific criterion “Development of technical and organizational study” in relation to the number of students and level of performance achieved.

It is noted:

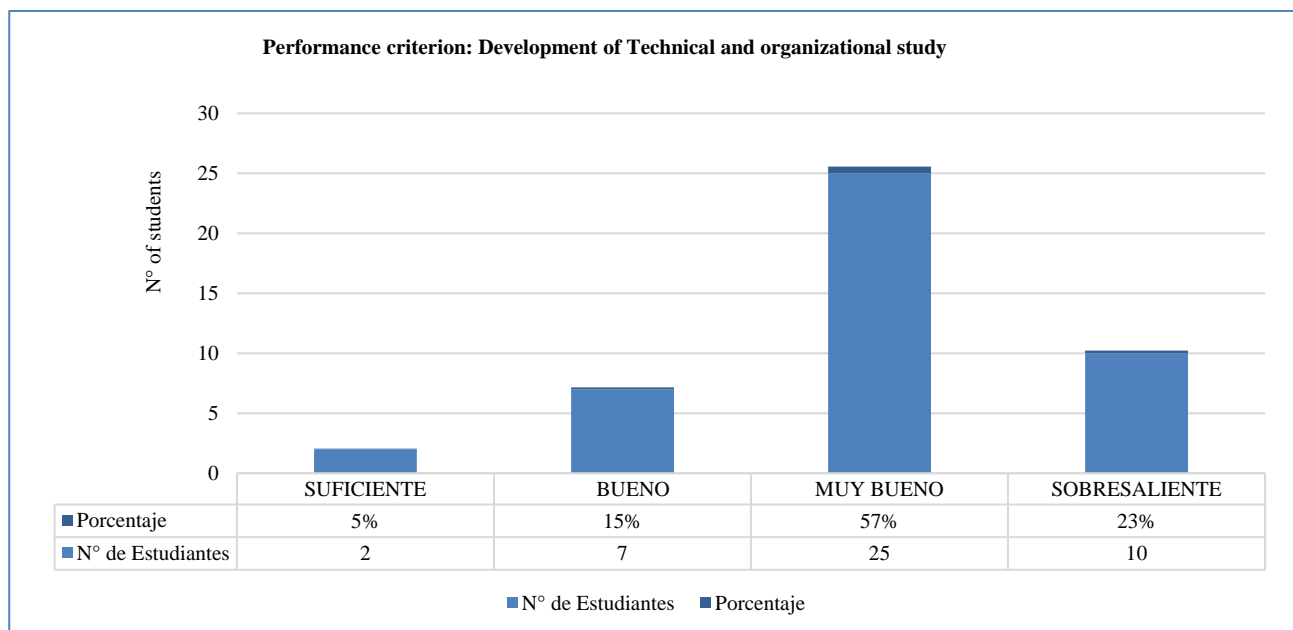
- 10% of students are at sufficient level, equivalent to a 4.0 grade.

- 15% of students are at a good level, equivalent to a 5.0 grade.
- 57% of students are at very good level, equivalent to a 6.0 grade.
- 23% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 13 shows that 57% of the students have a very good level of performance, equivalent to the 6.0 grade, which means, that the students are capable to develop a technical and organizational study. However, there is dispersion of responses across the four performance levels.



**Figure 12 Performance Criterion “Development of the Market Research”**



**Figure 13 Performance Criteria “Development of the Technical and Organizational Study”**

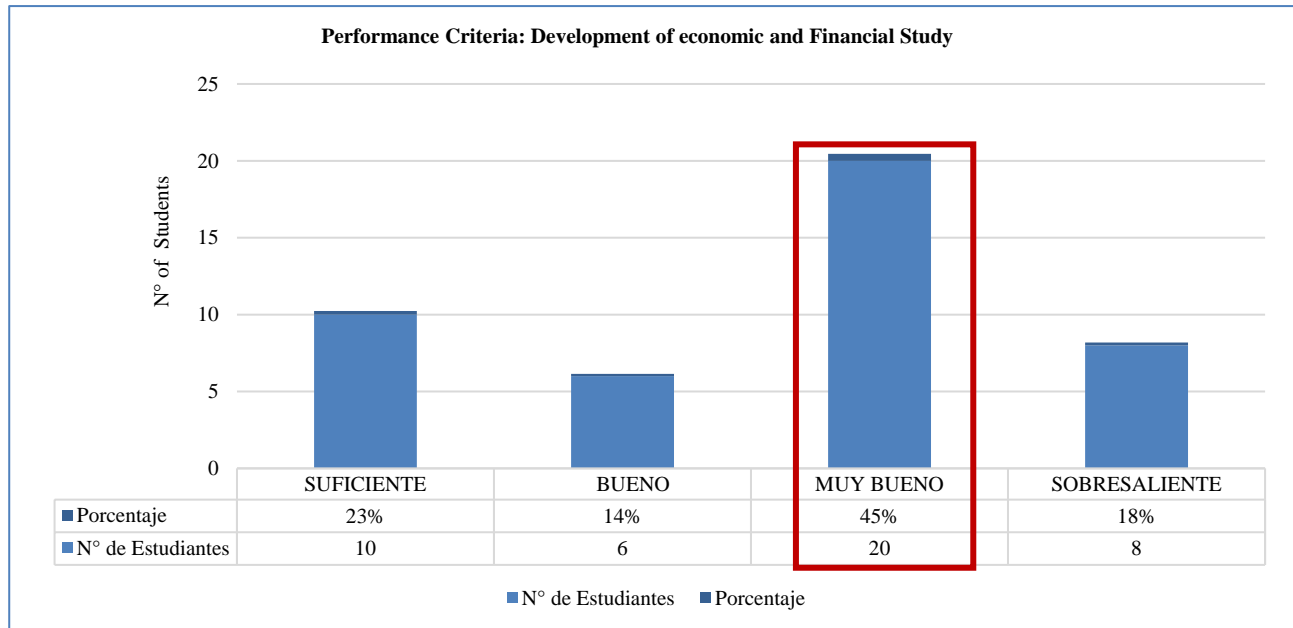
Figure 14 represents the specific criterion “Development of the economic and financial study” in relation to the number of students and the level of performance achieved.



It is noted:

- 23% of students are at a sufficient level, equivalent to a 4.0 grade.
- 14% of students are at a good level, equivalent to a 5.0 grade.
- 45% of students are at very good level, equivalent to a 6.0 grade.
- 18% of the students are at the proficient level, equivalent to a 7.0 grade.

Figure 14 shows that 45% of the students have a very good performance level, equivalent to the grade 6.0, which means, that the students are able to develop an economic and financial study. However, there are 23% of students at the adequate performance level, equivalent to a 4.0 grade.



**Figure 14 Performance Criteria “Development of the Economic and Financial Study”**

## 5. Conclusions

The self-evaluation of the students of the Project Evaluation Workshop course, which pays tribute to the specific competence of the graduation profile: “It formulates and evaluates investment projects to support the decision-making of the organization with an attitude prone to improvement, entrepreneurship and innovation”, which is developed and evaluated through two learning outcomes: 1) “Apply theoretical and methodological concepts in case analysis and practical experiences in project preparation and evaluation ”and 2) “Develop a situation or a real case, in which the evaluation of a business and the development of a new investment project is carried out ”, allows us to suggest:

The first learning result is achieved in most students, at a highly acceptable level of performance, which means that the teaching factors involved in achieving this learning must be consolidated, in order to maintain these performances.

The second learning outcome shows a greater dispersion in achievement, despite the fact that prior learning — the first learning outcome — is achieved at high levels of performance.

The students’ “comment” that certain previous learning in the field of “economy” and “financial” were not achieved at adequate levels of performance. It is suggested to apply assessment in the courses of Financial Analysis,

Economic Systems and Economic Engineering to identify levels of learning achieved by students.

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