

Peace and Region Semester, a strategy for comprehensive university training and contribution to regional development

Geisler Dayani Rojas-Forero^a, Juan Sebastián Rojas-Penagos^a & Helga Bermeo-Andrade^b

^a Semester Peace and Region, University of Ibagué, Ibagué, Colombia. geisler.rojas@unibague.edu.co, juan.rojas6@unibague.edu.co

^b Faculty of Engineering, University of Ibagué, Ibagué, Colombia. helga.bermeo@unibague.edu.co

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Abstract

Service-Learning (S-L) is a pedagogical strategy employed by Higher Education Institutions (HEIs) to promote the comprehensive and relevant education of their students, as well as to facilitate the social outreach of these institutions in their geographical area of influence. An example of the implementation of this strategy is the Peace and Region Semester (PRS) at the University of Ibagué, located in the Tolima region of Colombia. The results of the impact analysis generated by the PRS on a pilot group of 105 students who participated in the PRS during the 2023A period, using various statistical techniques, suggest that this pedagogical strategy does contribute to the comprehensive education of students and serves as a pathway for the university to make an effective contribution to regional development.

Keywords: service learning; social impact; university education; competency measurement; project management.

Semestre Paz y Región, una estrategia para la formación universitaria integral y la contribución al desarrollo regional

Resumen

El Aprendizaje en Servicio (ApS) es una estrategia pedagógica empleada por las Instituciones de Educación Superior (IES) para promover la formación integral y pertinente de sus estudiantes, así como para facilitar la proyección social de estas Instituciones en su área geográfica de influencia. Un ejemplo de la implementación de esta estrategia es el Semestre Paz y Región (SPR) de la Universidad de Ibagué, ubicada en la región del Tolima en Colombia. Los resultados del análisis del impacto generado por el SPR en un grupo piloto de 105 estudiantes que realizaron el SPR en el periodo 2023A, utilizando diversas técnicas estadísticas, sugieren que esta estrategia pedagógica si contribuye a la formación integral de los estudiantes, y es el camino que facilita que la Universidad aporte de manera efectiva al desarrollo regional.

Palabras clave: aprendizaje en servicio; impacto social; educación universitaria; medición de competencias, gestión de proyectos.

1 Introduction

Comprehensive education is a pedagogical strategy focused on the development of skills and competencies, which allow individuals to interact effectively in society through the acquisition of technical and professional knowledge, ethical values, social skills and a critical and reflective attitude when interacting with their environment. When following this strategy, educational institutions must assume the responsibility of training individuals capable of contributing to economic and social development in the search for a more equitable and just

society [1,2].

On the other hand, Service Learning (S-L) is an educational methodology that unites academic learning with community service, where students apply their knowledge and skills in projects that address real needs in their environment, promoting social commitment to strengthen communities and fostering an attitude of service and responsibility among students [3]. Experiences reported at the university level in international environments have been successful in face-to-face learning environments [4-6] as well as in digital learning environments [7].

Both strategies have been adopted by the University of Ibagué (Unibagué) in order to create the Peace and Region

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Semester (PRS), an academic and practical strategy whose purpose is to complement the disciplinary and comprehensive training of students in their last semester, as well as to promote sustainable human development in the region [8]. Throughout the twelve years of operation in which this strategy has been carried out, it has not been possible to define a model that allows the PRS to comprehensively evaluate the impact it on students, territories and different organizations involved.

To that end, Unibagué aims to promote the transfer of knowledge and the active participation of local stakeholders in social innovation processes, thereby enabling communities to strengthen their autonomy and access greater opportunities to improve their quality of life. These strategies are designed to build a sustainable model that integrates academia with the local environment, ultimately fostering a positive impact on local socioeconomic development [9]. The fulfillment of this promise within the region is achieved thanks to the S-L model developed in PRS, which helps students to understand the problems of the territory, understand its dynamics and commit themselves to providing solutions to the different needs presented by the organizations and municipalities where they have been linked. Likewise, the regional advisor assigned together with the teachers of the professional programs, play a fundamental role in providing social and pedagogical intention through their accompaniment to the different projects proposed, in order to generate capacities in the communities and entities of the territory [10-12].

For Higher Education Institutions such as Unibagué, which prioritizes a clear regional commitment, it is of vital importance to evaluate the scope of its actions in the territory and to determine how its work is valued and developed by the actors involved in its interdisciplinary practices [13,14]. Therefore, Unibagué's social outreach seeks to make the context of its geographical area of influence known to all its stakeholders and thereby engage various actors of the academic community in the generation of social transformation processes in the territory [15,16].

The PRS strategy lacked standardized metrics and evaluation methodologies that would allow it to recognize opportunities for improvement and the impacts achieved on its stakeholders. Consequently, the PRS did not have the possibility of verifying the socio-formative effect produced in the staff implementing the community projects, and in the organizations and public benefited.

Therefore, the need arose to establish a methodology and validate it to measure the social impact that the PRS generates for its students [17]. The PRS experience needs to be evaluated from different perspectives and fields of study, due to the formative nature with which this strategy was designed [18,19]. This study presents the results of the measurement of the contributions that the PRS strategy generates in their students.

2 Methodology

The measurement of PRS practice as an entity that integrates community service with learning that allows strengthening and transferring the knowledge acquired in the classroom to communities outside the academic world

[20,21], was based on the effort to quantify the contribution of PRS to the formation of generic and specific competencies in students.

Data collection was carried out using two instruments: Questionnaire for the *Assessment of the contribution to generic competencies* and the questionnaire for the *Assessment of the experience in the PRS*. In both cases, 105 responses were obtained from 278 students who were enrolled in PRS in the 2023A academic period (representative sample at a confidence level of 95% and a margin of error of 8%).

The questionnaire of *Assessment of the contribution to generic competencies* was structured with 13 questions of the statement type "The Peace and Region experience allowed me to:", through a Likert scale from 1 to 5, to measure the impact for the development of the four general competencies desired in the graduates of Unibagué:

- *Learning to learn* (C1): It is the ability to adequately use cognitive and metacognitive learning strategies to optimize the learning process. It also implies the ability to reflect on how knowledge is shared and how to act accordingly, self-regulating the learning process itself through the use of flexible strategies appropriate to new situations [22,23].
- *Teamwork* (C2): It is the strengthening of capacities to interact with different social groups in a horizontal process and with a willingness to learn in the face of culturally diverse knowledge. At the same time, skills are stimulated to interact and develop activities with other people in function of common objectives and in different contexts [24,25].
- *Personal autonomy and initiative* (C3): It is the ability to imagine, undertake, develop and evaluate individual or collective actions or projects with creativity, confidence, responsibility and critical sense. This allows them to become aware of their knowledge, skills and environment in order to act on it, while enabling the discovery of their own opportunities for the implementation of individual and collective projects [26,27].
- *Citizenship education* (C4): It is the deepening of the duties that as human beings must be assumed in daily coexistence and with a future perspective. It is about moving towards a citizenship in which critical reflection serves as a bridge for committed action [28,29].

The questionnaire included an open-ended question at the end of the questionnaire to inquire about the greatest impact generated by the PRS on their personal and professional life.

On the other hand, the application of the institutional instrument of *Evaluation of the experience in the PRS* to the same group of students, allowed for the obtain of information on various aspects of the experience, such as:

- Achievement of the specific competencies expected in PRS: On a Likert scale of 1 to 5, respondents rated the contributions to achieve the competencies in: a) Teamwork and assertive communication (TAC), b) Awareness of territorial issues (ATI), c) Adapting to diverse contexts (ADC), d) Problem solving (PS), e) Learning to learn (LL), and, finally, f) Understanding the environment (UE).
- Perceived contribution to Comprehensive Training (CT): Students rated on a categorical scale whether PRS contributed "Significantly", "In some aspects" or "Little or not at all" to their formation as citizens and professionals.

- Perceived contribution to Regional Development (RD): This was assessed through a three-level categorical scale: "Significantly", "In some aspects" or "Little or not at all", considering their contribution to the improvement of several critical areas in the municipality where they were assigned.

The general characterization variables of the PRS, that were considered to analyze differences in students' valuation of the PRS' contribution, were:

- Disciplinary field of the student (Df). Each student was classified in one of three categories: "Engineering" (ENG), "Management Sciences" (MANG), and "Humanities-Political Sciences" (HPC).
- Gender of the student (Gn) was divided in two categories: "Male" (M) and "Female" (F).
- Municipality of Tolima where the student was assigned (Mp), considering two categories: "Capital city" (CC), "Non capital city" (NCC).
- Zone where the experience took place (Zn), distinguishing between two categories: "Urban zone" (UZ) and "Rural zone" (RZ).
- Project Line (Pl) in which the PRS was focused, considering four categories: a) "Strengthening of the private enterprises, associations and non-profit organizations" (SEO); b) "Strengthening of public services entities" (IMPS); c) "Strengthening of the health and education entities" (SHE); and d) "Strengthening of public management in state entities" (SPM).
- Type of Entity (Te) where the experience took place, considering three categories: "Government and Public Management Entities" (GPE), "Productive and Social Organizations" (PSO), and "Educational and Health Entities" (EHE).
- Advisor Experience (Ae): They were classified in two categories: "Expert Advisor" (EXP) with three years or more in the PRS, and "Novice Advisor" (NEXP) with less than three years in the PRS.

Initially, the reliability of the survey instrument was confirmed using Cronbach's alpha coefficient. The values obtained exceeded 0.70 for each set of questions administered to measure each competency, indicating that the items consistently measured the same construct and providing a solid basis for further analysis of the results.

In order to synthesize the information contained in the items associated with each of the generic competencies, an Exploratory Factor Analysis (EFA) was applied. This statistical technique enables the identification and grouping of observed variables into underlying factors, thereby reducing data complexity and facilitating the interpretation of latent dimensions. The selection of EFA to examine the PRS experience was justified by the nature of the variables, which were collected using Likert-type scales. Although these scales yield ordinal data, they are commonly treated as quasi-continuous in this type of analysis, provided that the scales comprise at least five response categories and certain normality assumptions are met, thereby allowing the extraction of relevant information regarding the underlying structures.

The Factor Analysis was based on the common factor model, which postulates that each observed variable X_j can be

expressed as a linear combination of m factors latent factors plus an error term ε_j ; where λ_j represents the matrix of factor loadings and F_m the vector of latent factors [30, 31]. Formally, this is expressed as:

$$X_j = \lambda_{j1}F_1 + \lambda_{j2}F_2 + \dots + \lambda_{jm}F_m + \varepsilon_j, \quad J = 1, \dots, p.$$

or in matrix form:

$$X_j = \lambda F + \varepsilon$$

For the extraction of factors, the Principal Components (PC) method was employed, recognized as one of the most commonly used parameter estimation methods in Factor Analysis. The optimal number of factors was determined by applying Kaiser's eigenvalue criterion, retaining those factors with eigenvalues greater than 1. This procedure was complemented by an examination of the scree plot and an evaluation of the cumulative percentage of variance explained, with the aim of accounting for a significant proportion of the total variance (ideally close to 100%).

Additionally, the Kaiser-Meyer-Olkin (KMO) index was calculated to assess sample adequacy for conducting the factor analysis; high KMO values (typically above 0.70) confirm that the correlations among items are sufficiently robust to justify factor extraction (Tab. 1).

3 Results

The results of this study are divided into three sections: contribution to generic competencies, contribution to specific competencies and analysis of differences by general characterization variables.

3.1 PRS contribution to the generic competencies

For this analysis, we first resorted to Principal Component Factor Analysis (PA) to reduce the estimation of each construct associated with each of the four generic competencies defined to a single measure (the 1st Component). The PA performance measures demonstrated an adequate fit of the technique to the data collected for the corresponding competencies together with their weighted averages (Tables 1, 2).

As suggested by Fig. 1 and Table 3, the averages for each competency evaluated in the graduating students showed a highly positive value in the four generic competencies evaluated (C1 to C4). Particularly noteworthy is the higher value given by the surveyed group to the contribution of the PRS to the development of competencies associated with the development of autonomy and personal initiative, as well as to the development of citizenship training. In the first case, this is explained because the PRS represents for most of the students a move away from the University environment, as well as from their family environment, to enter for four months in the context of the assigned problems in a population of the territory. In the second case, this is explained by the fact that students are exposed to the problems of the region that motivate them to change their attitudes and opportunities to reinforce their formation as citizens. The high scores show a generalized positive impact of the PRS academic strategy for the development of generic competencies expected in students graduating from Unibagué.

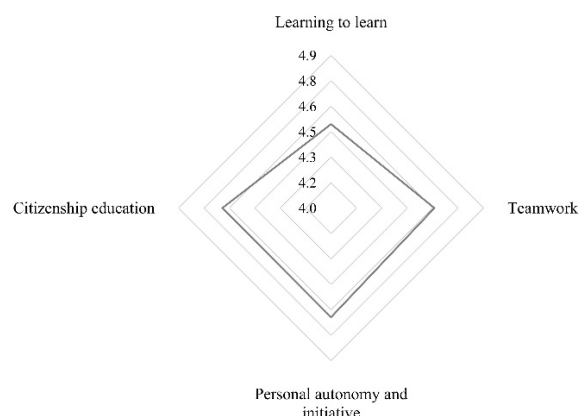


Figure 1. Average score per competency evaluated.
Source: This study

Table 1.
Results of the Principal Component Factor Analysis (n=103)

Question#	Weight	C	KMO	Cronbach's alpha	Var%
1	0.590	C1	0.764	0.746	57.03
2	0.578				
5	0.502				
9	0.611				
3	0.649	C2	0.806	0.841	67.78
4	0.700				
6	0.719				
7	0.643				
8	0.847	C3	0.5	0.817	77.80
10	0.847				
11	0.691	C4	0.707	0.836	75.32
12	0.763				
13	0.806				

Source: This study

Table 2.
Questionnaire of questions by PRS exit competency.

#	Affirmation	C
1	Acquire new learning or knowledge through my participation in the project components and understanding of the environment.	C1
2	Apply in professional and personal contexts, the skills, habits and values that I acquired in my integral formation process.	
5	Express my ideas and suggestions to my coworkers, in a clear and precise manner.	
9	To question myself about the position I have before reality and the dynamics of the environment.	
3	Improve the way I communicate with work teams and my superiors.	C2
4	Improve my ability to adapt to the environment in any context where I participate.	
6	Learning to make decisions by working collectively and collaboratively.	
7	Obtain the ability to contribute to an adequate coexistence in the social contexts where I participate.	
8	Reflect and act in order not to remain indifferent to the needs and problems of the social environment.	C3
10	To have a greater sense of responsibility, punctuality and commitment to my work.	
11	To apply my knowledge and skills for the common good as one of my purposes as a professional.	C4
12	To want to be a professional who contributes to the improvement of my immediate environment.	
13	Evaluate and reflect on the problems and challenges of my work and social environment, in order to propose scenarios or initiative proposals that provide solutions.	

Source: This study

Table 3.
Weighted average by exit competency PRS.

C	Average	Deviation	Max	Min
C1	4.50	0.62	5.0	3.0
C2	4.61	0.55	5.0	3.0
C3	4.64	0.54	5.0	3.0
C4	4.64	0.57	5.0	3.0

Source: This study

In this regard, the testimonies of the students surveyed corroborate the contributions of the PRS to their integral formation, from the four competencies evaluated, as can be seen below:

- Learning to learn (C1): Students agree that the PRS experience allowed them to adopt new knowledge that they did not know because it was foreign to their undergraduate degree and professional focus. Likewise, it allowed them to increase their capacities and skills, since the experience takes place in the municipalities, where students have to coexist with the communities for 15 weeks. This achievement is evidenced in the following testimony:

"In my case, the Paz y Región experience allowed me to awaken and get to know many ideas, knowledge and skills that were perhaps dormant inside me, as well as allowing me to visualize myself at a multidisciplinary level".

- Teamwork (C2): Some of the skills that were strengthened were decision-making, collaborative work and communication with the people around them. The students affirm that their ability to relate to others in personal and work environments was improved during their stay in the organization where they developed their PRS experience. This is supported by the following testimony:

"Working with people with disabilities was a big challenge for me at the beginning, I was afraid of making mistakes or maybe not being able to communicate with them, but in reality it was an enriching and very nice experience, I learned a lot from each one of them and to communicate in different ways, for me it will always be the most beautiful learning and the biggest challenge".

- Personal autonomy and initiative (C3): The PRS experience also contributed to self-management of time and sense of belonging with the student's work in the organization, since the student is confronted with countless situations where they have to make decisions quickly, also because the experience becomes a space for self-recognition and reflection of their own life projects, as seen in the following testimony:

"The big impact it generated on a personal and professional level was the responsibility of every day delivering something on time, as there were people involved in between who could be affected by not completing the corresponding tasks on time".

- Citizenship training (C4): Finally, the PRS contributes to the student's awareness and knowledge of the social context by exposing him/her to the different realities and

dynamics of the region outside his/her daily life, as can be seen in the following excerpt:

"Getting to know different contexts that people live in the municipality where I live, contexts of which I was ignorant... it is undoubtedly one of the greatest learnings I have had in student experience, it generated a great impact on my way of seeing life and how I want to focus my professional life."

3.2 Contribution to the specific competencies expected

For this analysis, we used average values generated by each student's evaluation of the six specific competencies expected in PRS: a) Working in teams and communicating assertively (TEyCA), b) Becoming aware of the problems of the territory (TCPT), c) Adapting to diverse contexts (ACD), d) Solving problems (SP), e) Learning to learn (AA), and finally, f) Understanding the environment (CE). The measures are average values and their position relative to each other, on a scale of 1 to 5 (Fig. 2).

The data presented in Fig. 2 and Table 4, indicate average values greater than 4.30/5.00 for all the specific PRS competencies assessed. This suggests a positive and sustained impact of the program on the development of soft skills in students, such as the competencies to adapt to diverse contexts (ADC) and to learn to learn (LL), and to a lesser degree, on the ability to become aware of territorial issues (ATI).

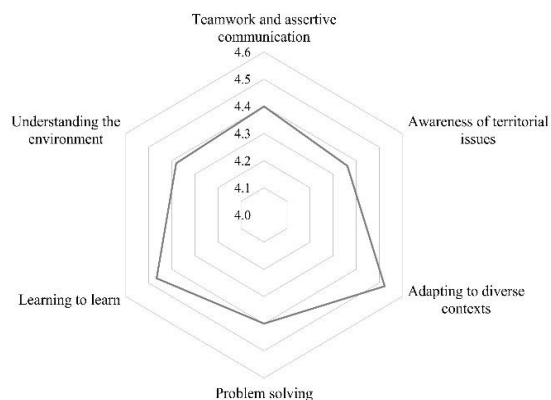


Figure 2. Average by specific competency evaluated in PRS
Source: This study

Table 4.

Assessment of the achievement of the specific competences expected in PRS

C	Average	Deviation	Max	Min
TEyCA	4.40	0.85	5	1
TCPT	4.36	0.90	5	1
ACD	4.52	0.81	5	1
SP	4.40	0.93	5	1
AA	4.47	0.90	5	1
CE	4.38	0.86	5	1

Source: This study

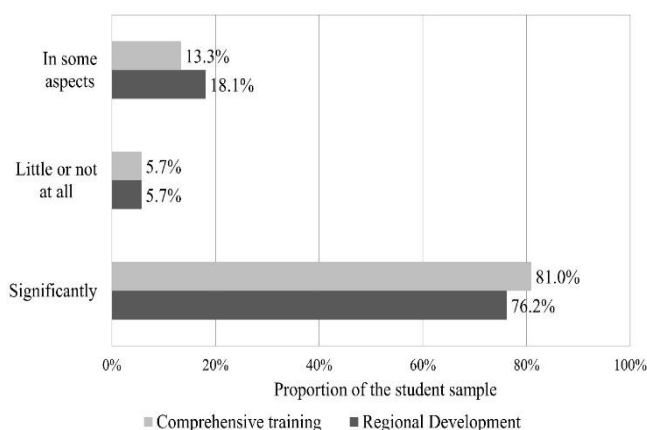


Figure 3. Assessment of the general impact of the PRS

Source: This study

The average evaluation of the PRS' contribution to Comprehensive Training and Regional Development, is summarized in Fig. 3. It shows that the PRS as a pedagogical strategy contributes significantly to Comprehensive Training according to the opinion of 80.95% of the students surveyed. Similarly, it shows that the PRS as a pedagogical strategy contributes significantly to Regional Development according to the opinion of 76.19% of the students surveyed. As Fig. 3 confirms, the students' perception of the contribution of the PRS shows a similar pattern in both aspects evaluated.

3.3 Analysis of differences in the valuation of the PRS

Finally, this study explored whether the generic variables associated with the student profile (gender, undergraduate) or the profile of the PRS practice (thematic line, intervention entity, tutoring experience, municipality and area), present significant differences in the valuation of the specific impacts generated by the PRS.

For this purpose, the average value of the evaluation of the six specific competencies, coded as: TEyCA, TCPT, ACD, SP, AA, CE, was taken and the new variable AVEC was generated. The Kruskal-Wallis nonparametric statistical test for independent samples was used to estimate whether there were differences between categories, with a significance level of 0.05 for the test decision. The results of this analysis are summarized in Tab. 5.

Regarding the student profile, there is evidence of a greater impact of the PRS on students who have a perception of positive change with respect to their PRS experience with an average of 4.53, and no difference in the impact of the program based on the undergraduate degree that the student is studying or by gender. Likewise, with respect to the internship profile, a greater impact was evidenced in the assignment in educational and public management entities with an average of 4.60 and 4.53 respectively. On the other hand, it was corroborated with the p-value that there is no difference in the perception of value when taking PRS, when variables such as the municipality of assignment, area, experience of the advising teacher and the thematic line of the project are considered.

Table 5.
Difference analysis in the valuation of the PRS

Label	Categories	AVEC Average	P-value test	Significant difference
Gender (Gn)	F	4.48 ^a	0.111	No
	M	4.30 ^a		
Discipline (Df)	ENG	4.42 ^a	0.358	No
	MANG	4.31 ^a		
	HPC	4.53 ^a		
Municipality (Mp)	CC	4.46 ^a	0.689	No
	NCC	4.37 ^a		
Zone (Zn)	RZ	4.27 ^a	0.730	No
	UZ	4.44 ^a		
Project line. (Pl)	SEO	4.37 ^a	0.403	No
	IMPS	4.25 ^a		
	SHE	4.37 ^a		
	SPM	4.66 ^a		
Type Entity (Te)	GPE	4.50 ^a	0.034	Yes
	PSO	4.19^b		
	EHE	4.60 ^a		
Advisor Ex. (Ae)	EXP	4.34 ^a	0.066	No
	NEXP	4.59 ^a		

Note 1. Similar letter means not difference between those categories

Note 2. Kruskal-Wallis test for independent samples ($\alpha=0.05$).

Source: This study

3.4 Discussion of results

This analysis allows us to determine, through the application of the two instruments, that the S-L experiences contribute significantly to the integral formation of the students, especially strengthening their general and transversal competencies related to autonomy and personal initiative [27,29], citizenship, teamwork [24] and learning to learn [22]. However, one of the essential characteristics of the Peace and Region Semester is that it configures interdisciplinary learning scenarios, so that students are personally and professionally challenged by having to work with others in real contexts.

This work is consistent with the contributions of Escofet, A. et al. [32], who developed and validated a questionnaire for the assessment of S-L projects in university contexts. In particular, they show, as in this article, that this pedagogical methodology allows students to develop in complex contexts, obtaining from it learning that they then apply in their personal and academic dimensions.

Similarly, the study of Hechenleitner et al. Page 6 and 7 [33] evaluated the impact of a S-L project on kinesiology students at a traditional Chilean university. Their evaluation showed that this type of project helps students to acquire greater social sensitivity to the problems of the territory, a category that is related to the citizenship training component that was evaluated and which obtained an average of 4.64. In this sense, many of the young university students are not aware of the diverse and profound realities of the territories, especially the rural ones, so interacting with the communities allows them to develop a service-oriented vocation.

Autonomy and personal initiative is a competence that allows students to make decisions in their daily lives based on their knowledge, experiences, values and beliefs, so S-

L experiences such as the Peace and Region Semester facilitate self-reflective processes that encourage students to question their being and doing, a situation that is not possible to work on in a comprehensive manner in the classroom. In turn, Acosta's study [34] developed and showed from an assessment instrument that these experiences promote the ability to self-manage, plan, manage projects and actions of common benefit, among others.

This research did not include other competencies and characteristics that emerge from service-learning pedagogies in IE and that may be important to take into account in future studies—for example, the type of community with which they work, the hidden curriculum, the level of studies achieved by the students, the ability to work in an interdisciplinary or transdisciplinary way [35], the ability to learn from others, etc.

4 Conclusions

This study has provided the opportunity to have a tool to measure the impact on students who have taken part in the PRS at Unibagué. This first methodological proposal validated with a pilot group of graduates from semester 2023A, provides a new instrument for measuring S-L at Unibagué and for any other Higher Education Institution that develops similar teaching and learning practices.

According to the findings, it is concluded that the PRS experience contributes to the integral formation of the students and graduates by emphasizing the development of skills and knowledge beyond the disciplinary field. Likewise, the highly positive value in the four generic competencies evaluated is highlighted, all of them being above 4 points on a scale where the maximum is 5 possible points, with Autonomy and self-initiative and Citizenship formation being the best valued competencies.

Similarly, the PRS experience contributes to the development of soft skills in students, such as the ability to adapt to diverse contexts (ADC) and to learn how to learn (AA), and to a lesser degree, the ability to become aware of the problems of the territory (APT).

On the other hand, the student's initial perception towards the PRS experience, as well as the type of institution where this experience takes place, are fundamental factors influencing statistically significant differences when evaluating perceived gains in soft skills. Specifically, students who begin with a positive attitude and are assigned to PSO demonstrate significantly greater perceived improvements in these skills.

Through this research, Unibagué has taken a first step to solve the need to measure the impact that PRS generates in the territory by evaluating the perception of its student-graduates. In addition, this project has created a new input to measure the extension of its academic activities and practices based on the commitment it has with the region. Therefore, the implementation of this type of metrics will allow the University to understand the tangible commitment that PRS students have achieved in their role as agents of change for the welfare of the communities located in the geographical areas of influence.

For future research, it is planned to use the outputs of this study to establish a more robust model that incorporates the perspectives of other actors involved in the process, such as Faculty-Advisors, Intermediaries, Interlocutors, and the communities or organizations that benefit from PRS.

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G.D. Rojas Forero, is BSc, in International Business Administrator, in 2009, MSc. in Administration and Operative Logistics in 2016. Since 2019 has worked as Peace and Region Semester director and professor of the social responsibility and management projects at University of Ibagué, Colombia.
ORCID: 0000-0003-0126-1088

J.S. Rojas-Penagos, received the BSc. Eng. in Industrial Engineering in 2024. Since 2024, has worked in the field of higher education as Regional Advisor for Peace and Region Semester at the Universidad de Ibagué, Colombia, guiding multidisciplinary projects developed by final-year students.
ORCID: 0009-0007-3731-6454

H. Bermeo-Andrade, received the BSc. Eng. in Industrial Engineer in 1994, MSc. in Industrial Engineering in 1997), and PhD in Engineering and Innovation Projects in 2007. Professor at the Faculty of Engineering in the University of Ibagué, Colombia, and associate researcher in Minciencias' Scienti System, Colombia. As a researcher, co-author of several research papers, research books and scientific communications in international congress related with innovation management and operation management.
ORCID: 0000-0001-6346-1128