



Service-Learning and transversal competencies: social responsibility in university students

Aprendizaje-servicio y competencias transversales: responsabilidad social en el alumnado universitario

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Abstract

The ongoing transformation underway in universities calls for a comprehensive reconfiguration of their internal structures, pedagogical approaches and objectives, and their engagement with society. Service-learning (SL) constitutes a pedagogical approach that fosters the development of transversal competencies across three core dimensions: instrumental, interpersonal, and systemic. The aim of this study was to examine the impact of participation in service-learning projects on university students' social responsibility by analysing the development of their transversal competencies. A quantitative, quasi-experimental methodology was adopted, using a descriptive and inferential, cross-sectional, and nomothetic research design. This approach facilitated a comparative analysis of university students' transversal competencies before and after participating in a service-learning project. The sample included 1,867 students, classified into two groups: 1,128 in the pre-test phase and 739 in the post-test phase. Data was collected using the Transversal Competencies Scale from the Undergraduate Transversal Competencies Assessment Questionnaire (CECTGRA). The null hypothesis stated that there were no significant differences in ordinal variable scores between the pre- and post-test phases. A significance threshold of $p < 0.05$ was set for rejecting the null hypothesis. The findings demonstrate that university students' participation in SL projects has a statistically significant impact on most dimensions of their transversal competencies. It is concluded that student engagement in pedagogical activities stemming from the service-learning approach serves as an effective mechanism for promoting social responsibility, and contributes to the development of a student profile conducive to democratic and pluralistic citizenship—that is, to forming citizens who reflect on their societal role.

Keywords: higher education; service-learning; transversal competencies; citizenship; social responsibility.

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Resumen

La continua transformación que atraviesan las universidades exige una reconfiguración de sus estructuras, enfoques pedagógicos y objetivos, así como de las interacciones que mantienen con la sociedad. El aprendizaje-servicio se constituye en un enfoque pedagógico que favorece el progreso de las competencias transversales en sus tres dimensiones: instrumental, interpersonal y sistémica. El objetivo fue conocer el impacto de la participación en proyectos de aprendizaje-servicio en la responsabilidad social del estudiantado universitario mediante el análisis del progreso de sus competencias transversales. Se empleó una metodología cuantitativa de tipo cuasi experimental, con un diseño descriptivo e inferencial, transversal y de carácter nomotético. Este enfoque permitió analizar las diferencias en competencias transversales del estudiantado universitario antes y después de participar en un proyecto de aprendizaje-servicio. La muestra estuvo compuesta por 1867 estudiantes, distribuidos en dos grupos: 1128 en la fase pretest y 739 en la fase postest. Para la recogida de datos se utilizó la Escala de Competencias Transversales del Cuestionario de Evaluación de Competencias Transversales de Grado (CECTGRA). La hipótesis nula planteaba que no existían diferencias significativas entre las puntuaciones pretest y postest en las variables ordinales, considerando un nivel de significación de $p < 0.05$ para su rechazo. Se concluye que la participación del estudiantado universitario en proyectos de aprendizaje-servicio ha tenido un impacto significativo en la mayor parte de las dimensiones que configuran sus competencias transversales y que la implicación del alumnado en acciones que derivan de este enfoque pedagógico supone un impulso para la responsabilidad social, y contribuye a la formación de un perfil favorable para la construcción de una ciudadanía democrática y plural, que reflexiona sobre su rol en la sociedad.

Palabras clave: educación superior; aprendizaje-servicio; competencias transversales; ciudadanía; responsabilidad social.

1. Introduction

International bodies linked to education (world conferences, declarations, resolutions, covenants) entrust higher education institutions with the responsibility to address major global challenges through interdisciplinary approaches. Topics such as sustainability, educational inclusion and development cooperation represent opportunities to create synergies for their integration into university-level study (Alcalá-del-Olmo & Gutiérrez, 2020). This constant transformation requires universities to reconfigure their structures, methodologies and objectives, as well as their links with society. In this context, the so-called “social mission” or “third mission” of the university reflects the need to strengthen its civic and inclusive engagement, linked to the formation of citizenship (García-Gutiérrez & Corrales-Gaitero, 2020).

The university, as an agent for training professionals, must assume a firm commitment to society (Batista *et al.*, 2021), prioritising the development of competencies for active citizenship and adapted to contemporary challenges. Therefore, this requires methodologies that complement theoretical learning and in-person classes. In this framework, service-learning (SL) emerges as an effective pedagogical proposal to materialise the third university mission, by connecting the academic curriculum with social needs, promoting ethical commitment and the development of competencies for civic participation in real contexts (Mayor-Paredes, 2019; Plaza-Angulo & López-Toro, 2024; Saldivia & Calderón, 2020; Severino *et al.*, 2023).

Service-learning plays a key role in the education of university students by enabling them to act as agents of social change and fostering competency-based learning, democratic awareness, social responsibility and civic attitudes, thus contributing to

a fairer, more inclusive and supportive society (Aláez *et al.*, 2022; Geier & Hasager, 2020; Lázaro-Cantabrana *et al.*, 2021; Mtawa & Masanche, 2020; Sartor *et al.*, 2020). This methodological approach is aligned with the development of transversal competencies, understood as the skills, attitudes and values that enable students to act in a critical, ethical and committed manner in complex and changing contexts. Analysing community needs fosters a democratic citizenship grounded in an ethic of action, underpinned by values such as participation, engagement and responsibility, which can be promoted through SL (Santos Rego *et al.*, 2021).

Geier & Hasager (2020) highlight how SL and learning for active citizenship foster a sustainable democratic culture among university students. By comparing experiences in Austria and the United States, the authors demonstrate the impact of these methodologies on the promotion of democratic values, civic participation and social awareness. In the same vein, García-Gutiérrez & Ruiz-Corbellá (2022) argue that the current university identity crisis should not be understood as something negative, but rather as an opportunity to enrich and broaden the scope of higher education. On the one hand, SL facilitates an “enriched” education, one that extends beyond employability to foster a humanistic, engaged, and socially responsible development. On the other hand, it facilitates an “augmented” education, thanks to the social interactions it promotes, both locally and internationally, fostering intergenerational responsibility.

Numerous studies have analysed the impact of SL on the development of university competencies (Asenjo *et al.*, 2021; Cebrián *et al.*, 2019; Folgueiras *et al.*, 2018; Girela *et al.*, 2025; Lobo de Diego & Monjas, 2024; Plaza-Angulo & López-Toro, 2024; Rodríguez-Izquierdo, 2019). Some studies highlight teachers’ positive perceptions regarding students’ acquisition of competencies through these transformative experiences (Sartor *et al.*, 2020). Recent research (Mella-Núñez *et al.*, 2021; Plaza-Angulo & López-Toro, 2024; Ruiz-Montero *et al.*, 2022) shows a positive relationship between participation in SL initiatives and the development of ethical and social competencies.

Folgueiras *et al.* (2018) indicate that teamwork, ethical commitment, adapting to new situations, and problem solving are all competencies that are developed through SL. Similarly, Asenjo *et al.* (2021) report positive results regarding the development of competencies linked to socio-educational engagement and self-efficacy. Other studies (Lobo de Diego & Monjas, 2024; Martínez *et al.*, 2022; Mayor-Paredes, 2019) associate participation in SL proposals with the strengthening of citizenship education, social engagement and responsibility, a greater understanding of social problems, and an increased commitment to service.

Emotional competencies have also been studied within the framework of SL, especially those linked to awareness of the need to contribute to a more humane and just society (García-Cabrero *et al.*, 2003; Sánchez-Calleja *et al.*, 2019). These competencies, alongside social and ethical competencies, reinforce the role of SL as a comprehensive educational tool, in close connection with university social responsibility.

Overall, the participation of university students in SL projects proves to be an effective strategy for the development of citizenship competencies. This educational experience leads to greater knowledge of social reality, increased sensitivity and social awareness, and enhanced civic engagement, thus favouring the formation of critical, responsible and active citizens (Buenaventura-Rubio, 2025; González-Marín, 2017; Mayor-Paredes, 2019).

Lin *et al.* (2025) highlight the sustained impact of SL when implemented as a curricular requirement. In their study at a public university in Hong Kong, they analysed how this methodology impacted graduates’ civic engagement two years after completing their studies. The results showed that SL not only maintained students’ motivation, but also fostered long-term social engagement, especially among those who initially displayed no inclination towards community engagement.

Such initiatives highlight the need for higher education to include SL in the framework of university social responsibility as a response to the challenges of increasingly complex, ambiguous and dynamic environments (Severino *et al.*, 2023). The institutionalisation of SL helps to consolidate socially responsible universities (Corrales and Andrade, 2021) and offers students learning opportunities in diverse contexts, promoting dialogue, communication, the development of civic values, and social engagement (Lobo de Diego & Monjas, 2024).

The cultivation of social responsibility in students requires the development of transversal competencies (Rekalde & Bujan, 2014), in addition to collaboration across disciplines to address complex tasks (Uganda, 2019). This signals the need for a methodological shift within universities, oriented towards paradigms focused on active learning and student engagement (Martínez-Clares & González-Morga, 2018).

Several studies have found that SL fosters the development of transversal competencies across the three dimensions (Furco & Billing, 2002; Godoy-Pozo *et al.*, 2019; González & Wagenaar, 2003; Martínez-Clares & González-Morga, 2017):

- Instrumental: critical thinking, organisation and planning, oral and written communication, technological competencies, and learning autonomy.
- Interpersonal: teamwork, social interaction, ethical and social commitment, emotional control, entrepreneurial attitude, ability to adapt to new situations, motivation, development of one's personal and professional life plans, decision-making.
- Systemic: research competence, information and knowledge management.

Therefore, SL is shaped as a pedagogical methodology capable of advancing social responsibility in university students by developing transversal competencies. These competencies, closely linked to social engagement, critical thinking, ethical principles, effective communication, social cohesion and civic identity, represent a valuable opportunity to cultivate students whose profile is aligned with democratic and pluralistic citizenship, and who are capable of reflecting on their role in society (Aránguiz & Fardella, 2019).

The aim of this study was to examine the impact of participation in service-learning projects on university students' social responsibility by analysing the development of their transversal competencies.

Based on this aim, we propose the following hypotheses: the inclusion of the SL paradigm in higher education revitalises the social responsibility of universities, since the involvement of university students in these initiatives results in the improvement of their transversal competencies across the three dimensions: instrumental, interpersonal and systemic (hypothesis 1). The participation of university students in SL projects contributes to their formation as democratic and pluralistic citizens, given that it improves multiple transversal competencies necessary for this purpose: critical thinking, communication, teamwork, social interaction, ethical and social commitment, emotional control, development of one's personal and professional life plans, or decision-making, among others (hypothesis 2).

2. Method

2.1. Research design

This research adopts a quantitative, quasi-experimental methodology and uses a descriptive, inferential, cross-sectional and nomothetic research design.

This approach facilitates the assessment of differences in university students' transversal competencies before and after participating in a service-learning project, with the aim of evaluating the impact of the intervention.

The questionnaire was implemented online and was administered to undergraduate and postgraduate students at the ten Spanish universities participating in a university teaching innovation project during academic year 2023/2024, the aim of which was to assess the development of transversal competencies among university students through service-learning actions, through university-school-community collaborative networks, taking as a reference the “Tunning” project (González & Wagenaar, 2003), the Sustainable Development Goals (United Nations General Assembly, 2015), and current educational legislation (LOSU, 2023).

It was administered in two separate points of time: before participation in the service-learning project (pre phase, in September 2023) and after its completion (post phase, in June 2024). This longitudinal design made it possible to assess the changes in the competencies developed by the students throughout the project.

The extensive time range between the two measurements, covering the whole academic year, ensures that the observed differences in results can be attributed with greater certainty to active participation in the SL project.

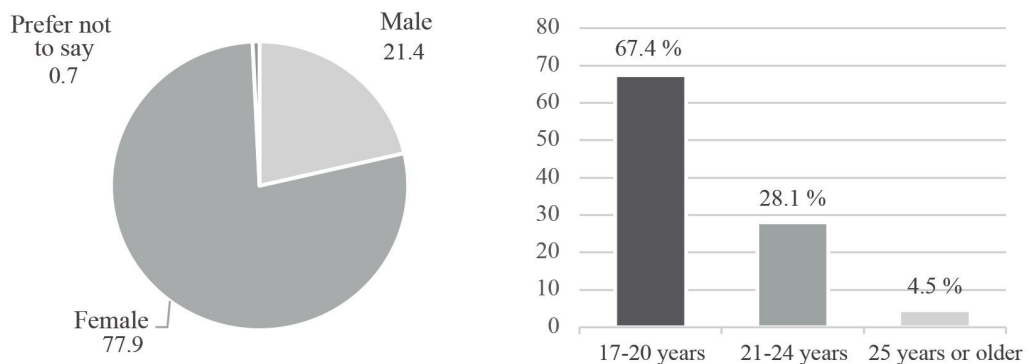
2.2. Participants

The study used a purposive sampling strategy, as the selected university students are part of a specific and accessible group, namely those enrolled in the universities involved in the innovation project, and also dependent, given that the same participants were assessed in both time periods.

The total sample amounts to 1,867 university students, 1,128 of whom belong to the pre-test phase, and 739 to the post-test phase.

78 % of the total sample are female, while 22 % are male. In terms of age, the sample is concentrated in the 17-20 age range, accounting for 67.4 % of the total. 28.1 % belong to the 21-24 age range, and a residual percentage (5.4 %) are older than 24.

FIGURE 1. Sample by gender and age.



Source: authors' own compilation.

The participants belonged to ten Spanish universities (Autónoma de Madrid, Burgos, Deusto, Granada, Balearic Islands, La Rioja, Murcia, Pública de Navarra, UNED and Valencia), most of which are public universities (N = 9).

Differences between universities were not assessed in this research due to the uneven distribution of the number of participants, as shown in table 1. The majority of the sample

comes from the Universidad de La Rioja (46.8%), while other universities are significantly under-represented, such as the Universidad de Deusto (1.4%), Universidad de Barcelona (1.0%), Universidad de las Islas Baleares (0.7%) and UNED (0.6%).

Therefore, it was decided not to make any inter-university comparisons, thus prioritising the internal validity of the study and avoiding interpretations that could be erroneous or unrepresentative.

TABLE 1. Sample by university.

University	Frequency	Percentage
Universidad de La Rioja	873	46.8 %
Universidad Pública de Navarra	218	11.7 %
Universidad Autónoma de Madrid	208	11.1 %
Universidad de Granada	189	10.1 %
Universidad de Murcia	178	9.5 %
Universidad de Valencia	130	7.0 %
Universidad de Deusto	27	1.4 %
Universidad de Barcelona	19	1.0 %
Universidad de las Islas Baleares	13	0.7 %
Universidad Nacional de Educación a Distancia (UNED)	12	0.6 %
Total	1867	100.0 %

Source: authors' own compilation.

Participants study 31 different subjects, albeit with a highly skewed distribution. As Table 2 shows, 10 of the subjects have no more than 5 cases, and 18 have fewer than 50. Similarly, some subjects have a very uneven pre- and post-test distribution, such as The School in Early Childhood Education. For these reasons, it was not possible to carry out a comparison of all registered subjects. Those for which the comparison was carried out are marked with an asterisk.

TABLE 2. Distribution of subjects, total, and according to experiment phase.

	Total		Pre-test		Post-test	
	n	%	n	%	n	%
Education for Coexistence*	371	19.9	194	52.3	177	47.7
Diversity and Psychoeducational Response*	216	11.6	109	50.5	107	49.5
Theoretical Foundations of Early Childhood Education*	178	9.5	126	70.8	52	29.2
Visual and Plastic Arts Education*	177	9.5	96	54.2	81	45.8
Society, Family and Educational Guidance*	103	5.5	71	68.9	32	31.1
Social Pedagogy*	91	4.9	84	92.3	7	7.7

Psychoeducational Foundations for the Inclusion of Students with SEN*	88	4.7	45	51.1	43	48.9
Inclusive Education and Response to Diversity: 0-6 years*	79	4,2	52	65.8	27	34.2
History of School*	74	4.0	41	55.4	33	44.6
Physical Activity and Health*	60	3.2	30	50.0	30	50.0
Child Learning and Development*	59	3.2	29	49.2	30	50.8
Cognitive and Linguistic Development*	59	3.2	28	47.5	31	52.5
Socio-educational Action in Substance Use Disorders*	57	3.1	47	82.5	10	17.5
The School in Early Childhood Education	49	2.6	46	93.9	3	6.1
History of Education in Spain*	41	2.2	24	58.5	17	41.5
Social Work, Disability and the Elderly	27	1.4	22	81.5	5	18.5
Social and Educational Inclusion/Exclusion of Youth in Spain and Europe	23	1.2	12	52.2	11	47.8
Personal and Professional Time Management	20	1.1	20	100.0	0	0.0
Sociocultural Animation as a Resource in Social Education	17	0.9	17	100.0	0	0.0
Inclusive Education and Response to Diversity: 0-6 years	16	0.9	0	0.0	16	100.0
International Education	15	0.8	0	0.0	15	100.0
Community Physiotherapy	13	0.7	8	61.5	5	38.5
Social Work with Groups	13	0.7	13	100.0	0	0.0
Teaching Innovation and Introduction to Educational Research	11	0.6	6	54.5	5	45.5
Final Degree Project	4	0.2	4	100.0	0	0.0
Learning and Motivation in the Classroom	1	0.1	0	0.0	1	100.0
Values Education	1	0.1	1	100.0	0	0.0
Early Childhood and Primary Education	1	0.1	1	100.0	0	0.0
Body Language and Motor Play in Early Childhood Education	1	0.1	0	0.0	1	100.0
Guidance and Counselling for Families	1	0.1	1	100.0	0	0.0
Transition to Active Working Life	1	0.1	1	100.0	0	0.0
Total	1867	100.0	1128	60.4	739	39.6

Source: authors' own compilation.

2.3. Instrument

The Transversal Competencies Scale of the CECTGRA questionnaire (Martínez-Clares & González-Morga, 2018) was applied.

The variables were measured using a 5-point Likert-type scale (1 = *not at all*, 5 = *very much so*). Fifteen transversal competencies were used as dependent variables in this study. The question used to collect the information is indicated for each variable:

- Q01. Organisation and planning. Am I able to structure my ideas, manage my time well, and differentiate between what is important and what is a priority?
- Q02. Oral and written communication in one's own language. Am I able to express complex ideas orally and in writing, and communicate them to different audiences?
- Q03. Use of information and communication technologies. Am I able to use software for handling information (word processing, etc.) and ICT-based information management (search, selection, etc.)?
- Q04. Communication in a language other than one's own. Am I able to read, understand, express ideas and communicate in another language?
- Q05. Project development and decision-making. Am I able to set goals, make responsible decisions and identify strengths and weaknesses?
- Q06. Information and knowledge management. Am I able to search for, analyse and synthesise information from a critical standpoint?
- Q07. Teamwork. Am I able to collaborate and cooperate in a team based on the values of respect, tolerance, dialogue and negotiation?
- Q08. Social interaction. Am I able to establish relationships by showing active listening, empathy and assertiveness?
- Q09. Social and ethical commitment. Am I able to value and respect diversity, as well as demonstrate commitment to the environment and social responsibility?
- Q010. Emotional control. Am I able to perform under pressure, handle stress and tolerate frustration?
- Q011. Autonomous work. Am I able to be self-critical and access the resources available and necessary for lifelong learning?
- Q012. Entrepreneurial attitude. Am I able to spot new opportunities, take initiative, and be creative and innovative?
- Q013. Ability to adapt to new situations. Am I able to tolerate change and uncertainty, and apply theory to practice?
- Q014. Motivation. Am I able to engage in work with a positive attitude, a drive for improvement, and a commitment to quality?
- Q015. Research competence. Am I able to identify needs, gather information, interpret it and draw conclusions?

2.4. Data analysis

For the statistical analysis, a hypothesis test was conducted. In this case, the null hypothesis established was whether the score on the ordinal variables Q01 to Q15 was the same between the pre-test and the post-test questionnaire, both separated by participation in a SL project, which allowed us to detect and measure any potential effect on the dimensions that these variables measure. The cut-off value for rejecting the null hypothesis was set at $p > 0.05$.

To test the null hypothesis, the non-parametric Mann-Whitney U test for group differences was used to compare the scores of ordinal variables between two distinct groups.

Non-parametric tests were chosen due to the quasi-experimental nature of the study and the ordinal nature of the data, stemming from Likert-type items. Moreover, normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) showed that several dimensions did not

follow a normal distribution. The heterogeneity of the sample, with an uneven distribution between degrees and universities, reinforces this choice. Thus, non-parametric tests allow for pre-and post-test comparisons that are more appropriate for the type of data and ensure the validity of the results.

3. Results

Most of the variables, except Q07, Q08 and Q09, show significant differences between the pre-test and post-test groups, since they have p -values < 0.05 . The results indicate that, for most of the variables, the null hypothesis is rejected and, therefore, it can be concluded that there is indeed a difference between the phases of the intervention.

TABLE 3. Results of the statistical analysis of the differences between groups.

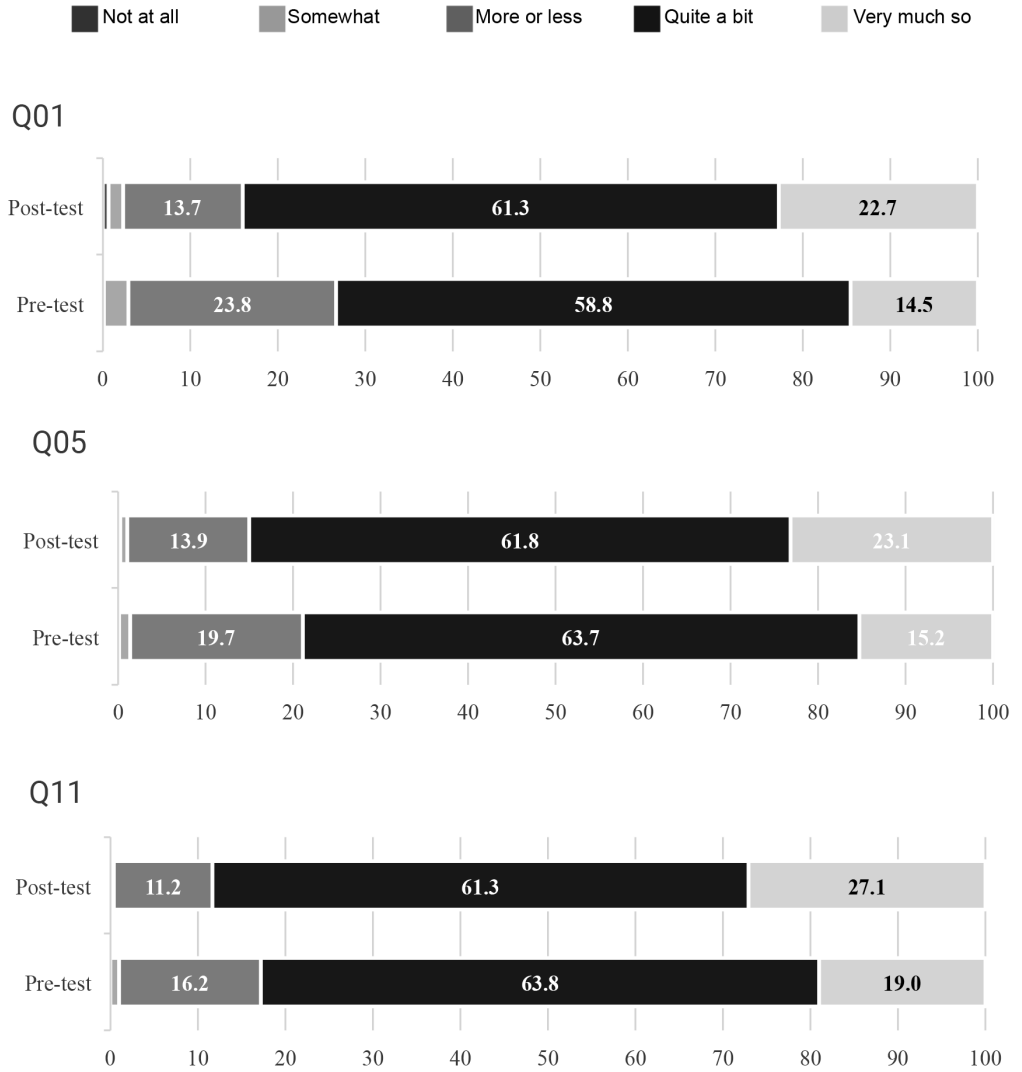
Variable	p-value	Statistic	Effect Size	Mean group 1	Mean group 2
Q01	< .001	-6.243	0.150	878.6	1018.6
Q02	< .001	-6.327	0.156	876.4	1022.0
Q03	< .001	-5.400	0.137	883.5	1011.1
Q04	< .001	-5.490	0.142	881.4	1014.2
Q05	< .001	-4.834	0.114	892.0	998.1
Q06	< .001	-6.440	0.153	877.5	1020.2
Q07	0.448	-0.759	0.018	927.2	944.4
Q08	0.246	-1.160	0.028	923.6	949.9
Q09	0,096	-1.666	0.040	919.1	956.7
Q10	< .001	-4.013	0.102	896.2	991.7
Q11	< .001	-4.790	0.112	892.4	997.4
Q12	< .001	-5.069	0.126	887.4	1005.1
Q13	< .001	-3.600	0.086	902.1	982.7
Q14	0,016	-2.398	0.058	912.6	966.6
Q15	< .001	-4.570	0.108	893.9	995.1

Source: authors' own compilation.

3.1. Organisational and planning competencies

The competencies associated with organisation, decision-making and autonomous work (P01, P05, P11) show statistically significant differences between the pre-test and the post-test. The means in this second phase are clearly higher, indicating an improvement in the participants' ability to organise and manage their time, in addition to in their ability to make responsible decisions and work autonomously. Although the effect size is moderate (between 0.112 and 0.150), this suggests that participation in the SL project had a noticeable impact on these key competencies for academic and professional performance.

FIGURE 2. Organisation and planning (Q01), project development and decision-making (Q05) and autonomous work (Q11).

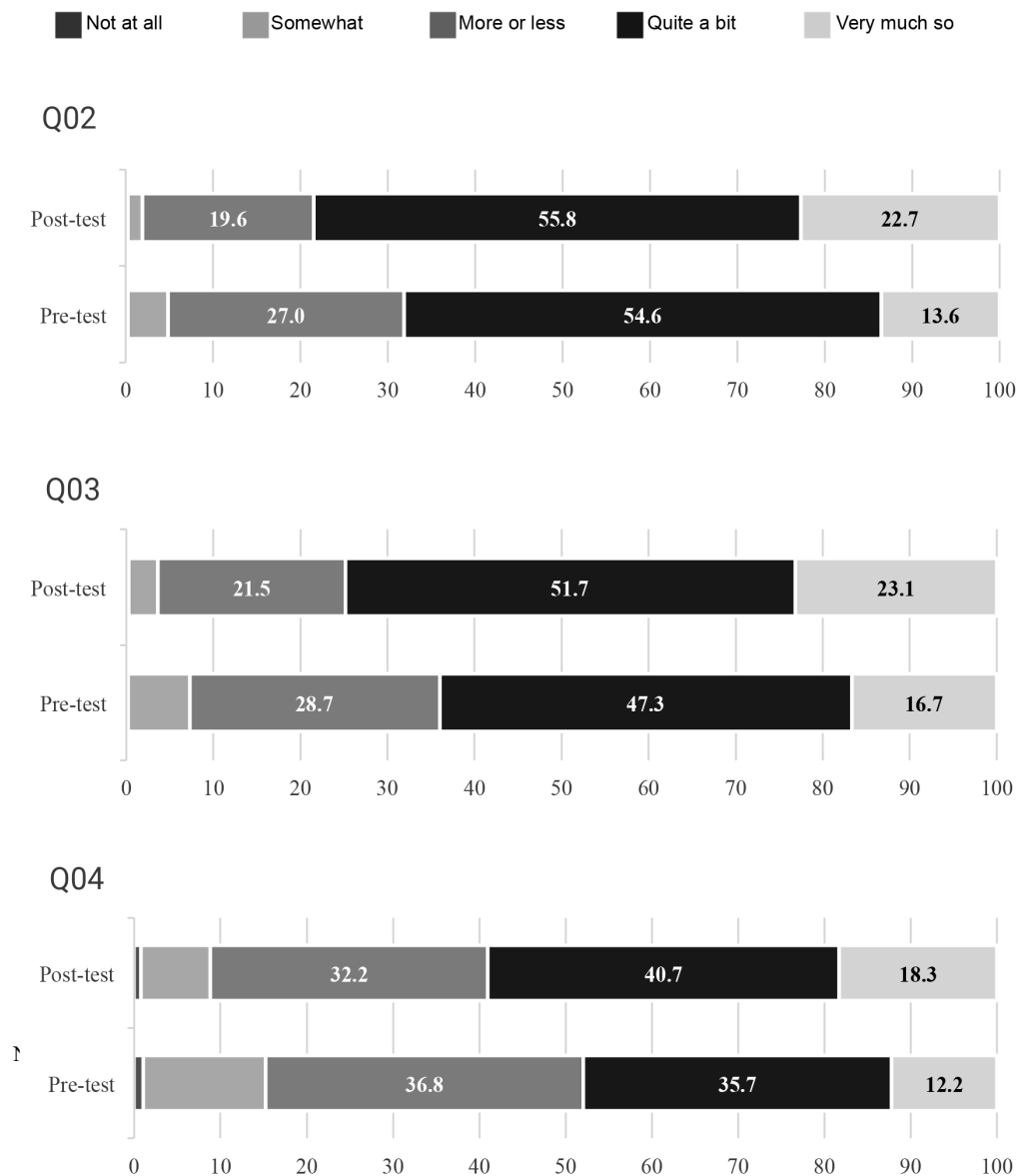


Source: authors' own compilation.

3.2. Communication competencies

The variables related to oral, written and digital communication (Q02, Q03, Q04) also show significant improvements in the post-test. Specifically, the use of technology to manage information and the ability to communicate in a second language show significant differences with moderate effect sizes. This indicates that the participants have improved their use of technological tools and their ability to communicate in different contexts.

FIGURE 3. Oral and written communication in one's own language (Q02), use of information and communication technologies (Q03) and communication in a language other than one's own (Q04).

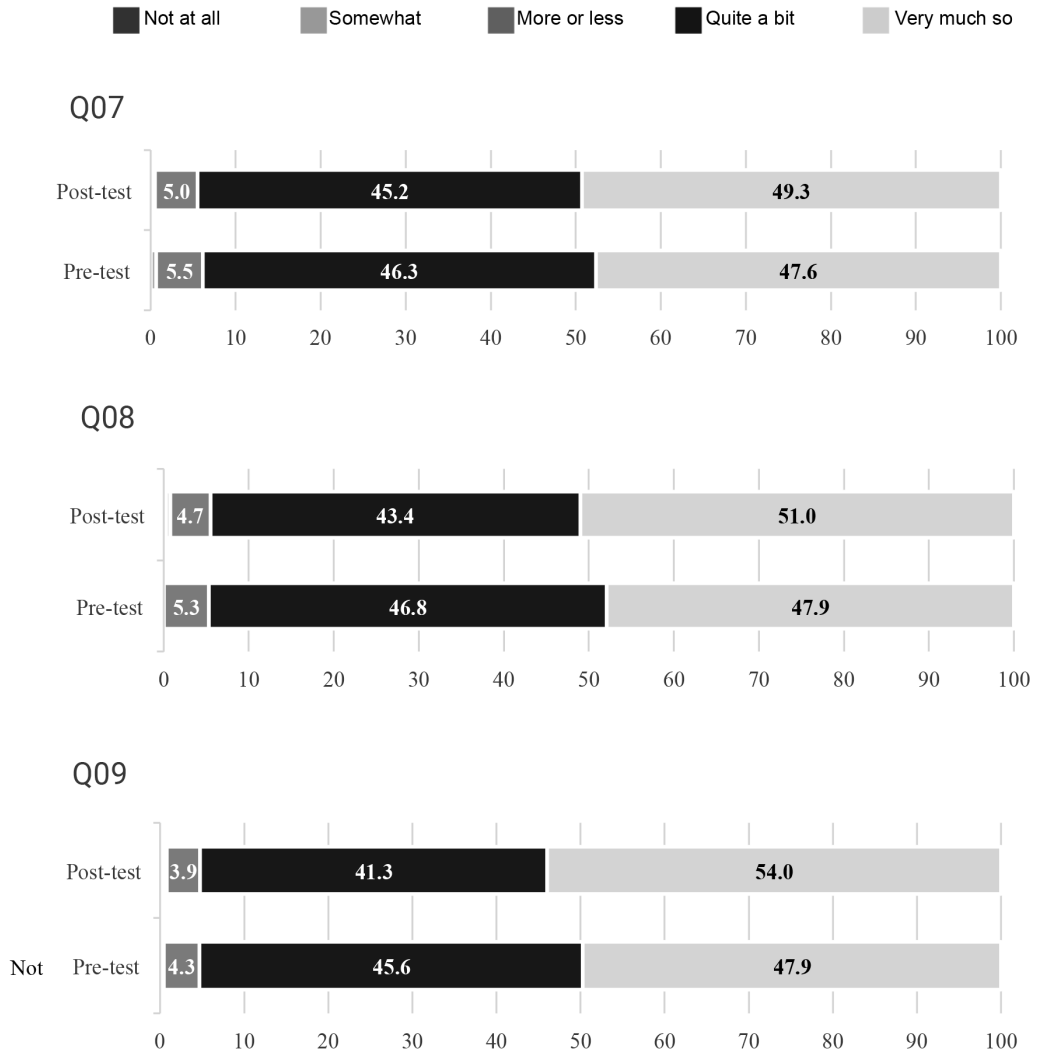


Source: authors' own compilation.

3.3. Social and interaction competencies

Contrary to the areas mentioned above, the variables related to teamwork, social interaction and social-ethical commitment (Q07, Q08, Q09) show no significant differences between the two phases. The *p*-values greater than 0.05 and the small effect sizes suggest that these competencies were not significantly affected by the intervention.

FIGURE 4. Teamwork (Q07), social interaction (Q08), social-ethical commitment (Q09).

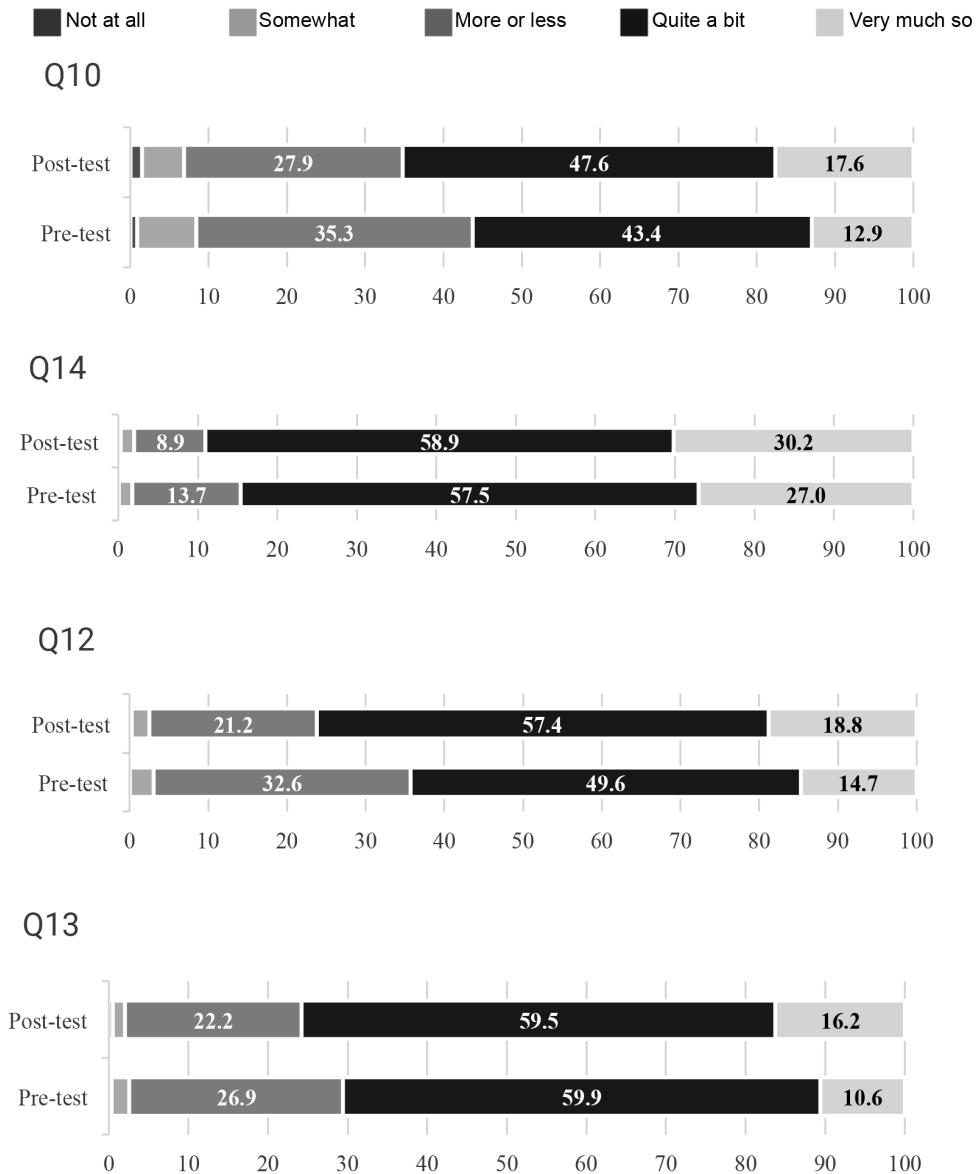


Source: authors' own compilation.

3.4. Emotional management, entrepreneurial attitude, adaptation and motivation

The competencies related to emotional management, entrepreneurial attitude and adaptability (Q10, Q12, Q13 and Q14) also show significant differences, although with more modest effect sizes (between 0.086 and 0.126).

FIGURE 5. Emotional management (Q10), motivation (Q14), entrepreneurial attitude (Q12) and ability to adapt to new situations (Q13).

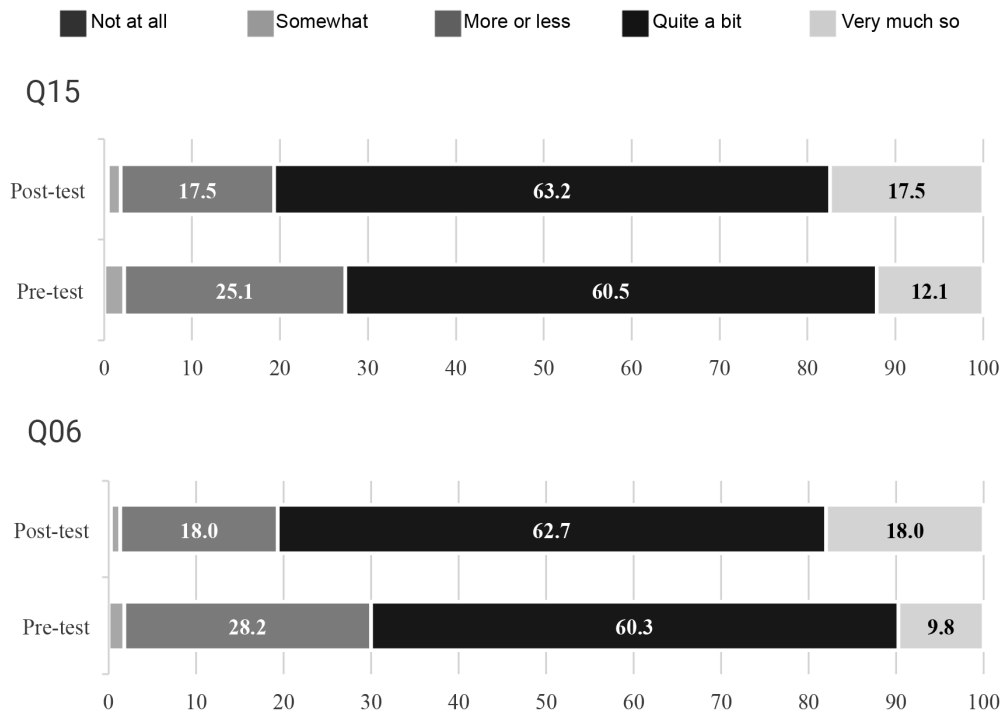


Source: authors' own compilation.

3.5. Information and knowledge management, and research competence

Ultimately, only research competence (Q06 and Q15) reflects significant differences between the pre-test and post-test, with small effect sizes (0.108). This suggests that, although participants showed an improvement in their research skills after participation in the service-learning project, the impact of the intervention was less pronounced compared to the other competencies analysed, and null in the case of motivation.

FIGURE 6. Research competence (Q15) and information and knowledge management (Q06).



Source: authors' own compilation.

3.5. Analysis by degree programme

Ten degree programmes took part in the study: Bachelor's Degree in Primary Education, Bachelor's Degree in Early Childhood Education, Bachelor's Degree in Pedagogy, Double Degree in Early Childhood and Primary Education, Bachelor's Degree in Social Education, Bachelor's Degree in Social Work, Bachelor's Degree in Psychology, Bachelor's Degree in Physiotherapy, Master's Degree in Teacher Training and, finally, Master's Degree in Art Therapy and Art Education. Comparisons could only be made for the first five; for the rest, either no data could be collected in the post-test phase or only a few cases were collected.

At first glance, it is noteworthy that the effect of the programme implemented was significant on the variable "information and knowledge management", regardless of the degree. Specifically, the effect size in the case of the Double Degree in Early Childhood and Primary Education, and the Bachelor's Degree in Social Education exceeds 0.25. Two other variables that also demonstrated significant improvements in all degree programmes are "oral and written communication in one's own language" and "emotional control".

Furthermore, with regard to social and interaction competencies, which in the sample as a whole did not demonstrate significant changes in any of the variables, it should be noted that the “teamwork” variable did not show any improvement in any of the individual degree programmes either. Conversely, significant changes were reported for the variables “social interaction” and “social and ethical commitment” in the case of the Bachelor’s Degree in Social Education, and also for the variable “social and ethical commitment” among the population studying the Bachelor’s Degree in Primary Education.

Overall, the populations studying the Bachelor’s Degree in Primary Education and the Double Degree in Early Childhood and Primary Education are those that have demonstrated the greatest number of significant changes in the variables, all of which were positive.

TABLE 4. Comparison by degree programme.

	Bachelor’s Degree in Primary Education	Bachelor’s Degree in Early Childhood Education	Bachelor’s Degree in Pedagogy	Double Degree in Early Childhood and Primary Education	Bachelor’s Degree in Social Education
Q01	0.155**	0.143**	0.173	0.265**	0.184
Q02	0.122**	0.176**	0.256*	0.266**	0.230
Q03	0.112**	0.183**	0.162	0.181	0.099
Q04	0.128**	0.073	0.137	0.099	0.237
Q05	0.149**	0.058	0.109	0.221*	0.233
Q06	0.157**	0.112*	0.203*	0.329**	0.270*
Q07	0.063	-0.032	0.045	0.041	0.031
Q08	0.042	0.014	0.081	-0.026	0.247*
Q09	0.098**	-0.018	-0.106	0.102	0.242*
Q10	0.053	0.098*	0.216*	0.331**	0.260*
Q11	0.118**	0.110*	0.216	0.201*	0.182
Q12	0.123**	0.08	0.143	0.307**	0.173
Q13	0.075*	0.121*	0.18	0.277**	0.158
Q14	0.073*	0.037	-0.002	0.195*	0.026
Q15	0.102**	0.091*	0.019	0.202*	0.048

* $p \leq 0.05$ ** $p \leq 0.005$

4. Discussion

The results obtained confirm that student participation in service-learning (SL) projects has a positive impact on most of the dimensions of their transversal competencies, in line with previous studies (Buenaventura, 2025; García-Cabrero *et al.*, 2003; González-Marín, 2017; Mayor-Paredes, 2019; Santos Rego *et al.*, 2021). This finding reinforces the value of SL as a pedagogical strategy that goes beyond academic learning by fostering a comprehensive education oriented towards democratic and pluralistic citizenship (Aránguiz & Fardella, 2019; Buenaventura-Rubio, 2025; Geier & Hasager, 2020; González-Marín, 2017; Mayor-Paredes, 2019; Santos Rego *et al.*, 2025). Its inclusion in the university curriculum can strengthen students’ long-term civic engagement (Lin *et al.*, 2025).

In the instrumental dimension, improvements in organisation, planning and autonomy are observed. This suggests that SL fosters key skills such as time management, task prioritisation and self-regulation of learning (Asenjo *et al.*, 2021). Progress can also be observed in communication and technological competencies, which indicates a greater ability to express oneself clearly, interact with different audiences and use digital tools effectively (Lobo de Diego & Monjas, 2024).

In the interpersonal dimension, progress in decision-making, entrepreneurial attitude and the ability to adapt to new situations is of note. These results point to the development of initiative, creativity and flexibility, core competencies for navigating uncertainty and translating knowledge into practice (Folgueiras *et al.*, 2018; Martínez-Clares & González-Morga, 2018; Mayor-Paredes, 2019). However, no significant improvements were observed in teamwork, social interaction and social-ethical commitment. This could be due to the fact that these competencies were already present in the student profile or because the programme design did not specifically address them. Nevertheless, other studies showed progress in these areas (Folgueiras *et al.*, 2018; Mella-Núñez *et al.*, 2021; Plaza-Angulo & López-Toro, 2024), suggesting that their development depends on the context and pedagogical intentions.

The analysis by degree programme shows that in degrees such as Social Education and Primary Education, there are indeed improvements in social-ethical commitment and social interaction. This indicates that the educational context influences the development of these competencies, and that it is necessary to adapt SL proposals to the characteristics of each degree programme.

In the systemic dimension, an increase in research competence is observed. Students showed improvement regarding identifying needs, gathering information and drawing conclusions (Furco & Billing, 2002). There is also an improvement in information and knowledge management, reflecting a greater critical ability to search for, analyse and synthesise relevant data.

The impact of SL varies according to the degree programme. Improvements are more evident in the Double Degree in Early Childhood and Primary Education, and in the Bachelor's Degree in Primary Education. Meanwhile, in Pedagogy and Social Education, progress is more limited in scope. This suggests that the institutional environment and curricular approach influence outcomes, which reinforces the need to design contextualised SL experiences consistent with each educational programme.

Finally, although the sample was predominantly female, no significant differences were found by gender or age regarding the development of competencies. This finding contrasts with that reported by Ruiz-Montero *et al.* (2022) and suggests that it would be desirable to further explore how personal and contextual variables influence these processes.

5. Conclusion

The results of this research confirm that the participation of university students in service-learning (SL) projects leads to a significant improvement in most of the transversal competencies assessed, with no deterioration detected. This finding validates the hypotheses initially proposed: on the one hand, SL revitalises university social responsibility by showing improvements in the instrumental, interpersonal and systemic dimensions; and on the other, it contributes to the formation of democratic and pluralistic citizenship by strengthening competencies such as critical thinking, communication, teamwork, emotional control, decision-making, and the development of one's personal and professional life plans.

The limitations of the study include the fact that it was not possible to match individual pre-test and post-test responses, which prevented the application of paired-sample statistical tests. Moreover, unequal participation across universities made it difficult to perform valid comparisons between such, as small sample sizes in some institutions compromise the robustness and generalisability of the results. Limitations were also identified in certain degree programmes, where the scarcity of data prevented the application of appropriate statistical analyses.

Despite these limitations, the findings reinforce the importance of SL as a pedagogical paradigm in higher education. Its implementation and institutionalisation are key strategies to foster students' social and ethical commitment, as well as their awareness of community challenges. Therefore, a proposal is made to advance lines of reflection and action that drive forward methodological change in the university, with the goal of reinforcing the personal and social purpose of academic education (Chan *et al.*, 2019; Valdemoros & Alonso, 2024, 2025).

This approach is supported by the existing regulatory framework. Article 18.4 of Organic Law 2/2023 of 22 March on the University System (LOSU) calls on universities to promote equitable, inclusive and sustainable development by strengthening collaboration with local administrations and social actors through projects such as service-learning. Furthermore, article 33.k. recognises the right of students to participate in university SL activities as part of their education. These guidelines are in line with Royal Decree 822/2021, which establishes the need for more active teaching, in which traditional university lectures coexist with methodologies that encourage autonomous work and meaningful learning.

In conclusion, service-learning is consolidated as an effective pedagogical strategy for the comprehensive development of transversal competencies in university students. Based on the results obtained, it is recommended to:

- Consolidate improvements in the instrumental dimension through the systematic integration of active methodologies that reinforce organisation, planning and communication in various formats.
- Design specific interventions to strengthen interpersonal competencies that showed no significant progress, such as teamwork and social-ethical commitment, incorporating collaborative dynamics with a real impact on the community, and spaces for critical reflection.
- Reinforce the systemic dimension through projects that include applied research and rigorous information management, thus promoting autonomy and lifelong learning.
- Adapt the design of the projects to the unique characteristics of each degree programme, taking into account the training contexts and specific needs.
- Implement continuous assessment and feedback processes that allow for the adjustment of pedagogical proposals and guarantee the sustainability and effectiveness of SL experiences.

These elements make up a framework of action that can help consolidate service-learning as a transformative tool in higher education, capable of training professionals who are socially engaged and equipped to tackle social challenges from a critical, ethical and collaborative perspective.

Author contributions

María Ángeles Valdemoros San Emeterio. Conceptualisation, funding acquisition, methodology, data curation. Rosa Ana Alonso Ruiz. Conceptualisation, funding acquisition, methodology, data curation. Magdalena Sáenz de Jubera Ocón. Conceptualisation, validation, supervision.

IA Statement

We declare that this article is an original piece of work, produced entirely by the authors. We state that no generative artificial intelligence tools were used for the creation, modification or assistance with the writing of the text, the development of ideas, the analysis of information or the drawing of conclusions. All content was produced by means of our own intellectual work, based on personal research, reflection and analysis.

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