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Sensitive cartographies and artistic practices as a situated method: Research-creation in depopulated rural communities

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ABSTRACT

Rural depopulation in Castile and León highlights the need for participatory methodologies capable of rebuilding community ties and generating situated knowledge. Despite the growing use of collaborative mapping, there remains a gap in the literature regarding systematic approaches that integrate social cartography, artistic practices, and service-learning with public feedback processes in cultural institutions. In response, this article presents the framework of *sensitive cartographies*, developed in the province of (BLINDED) through a mixed-methods design combining interviews, collaborative mapping, audiovisual narratives, and a questionnaire administered to students.

The study enabled a situated reinterpretation of rural geographies based on the voices of local inhabitants and explored the relationship between rural identity, rural and territorial memory, and processes of community activation. The findings are organized around four key analytical dimensions: participatory knowledge production, desirable futures, local agency, and the transition from academic research to the public sphere through expanded cartography. The ethical implications of working with rural migrant populations and the role of art as an epistemic and affective mediator are also discussed. Overall, the research proposes a comprehensive and dialogical approach that contributes to understanding and strengthening community processes in rural regions affected by depopulation.

1. Introduction

Rural depopulation is one of the main problems of the 21st century in large areas of southern Europe, especially in the interior of the Spanish peninsula. This process involves not only demographic decline, but also the erosion of the social, economic, and symbolic fabric that sustains community life (Eilola et al., 2019; Carrión & Albert, 2022). In this scenario, rural memory becomes a vulnerable dimension, often silenced in official discourse, leading to forms of territorial and cultural exclusion (Wu, 2025; Zhuang et al., 2022). Addressing this issue, the article examines how social cartography, integrated with artistic practices and critical pedagogy, can simultaneously operate as a research methodology and a tool for community activation in depopulated rural areas.

Within this framework, we propose the concept of *sensitive*

cartographies, understood as an approach that integrates social cartography, artistic practices, and critical pedagogy oriented toward the link between university and community. In this sense, sensitive cartographies do not replace social or participatory cartography, but rather operate as an overarching framework that articulates these mapping practices with artistic, pedagogical, and affective dimensions. These cartographies emphasize the affective, relational, and situated nature of knowledge production, aligning with studies that underscore the role of affections and embodied experiences in territorial bonds (Ahmed, 2004; Pink, 2009). They recognize that the maps produced by participants represent not only places or trajectories, but also emotions, memories, and ways of inhabiting the territory, functioning as artifacts that express imaginaries and transformations (Pink & Sumartojo, 2023). This approach also addresses a gap in the literature: the scarcity of studies

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that systematically articulate participatory mapping, artistic practices, and service learning, especially in rural contexts affected by depopulation.

Thus, we understand *social mapping* as a collaborative process of representing the territory in which participants construct maps that integrate experiences, local knowledge, memories, and community values. In this study, social mapping is conceived as a specific form of participatory mapping, grounded in collective knowledge production, dialogue, and community engagement. Unlike technical cartography, social mapping emphasizes the affective, narrative, and relational dimensions of lived space, making visible what does not usually appear in conventional institutional or geospatial records (Araujo, 2020; Carrión & Albert, 2022). Within the framework of *sensitive cartography*, this approach not only produces territorial information, but also activates processes of reflection, agency, and recognition among participants.

The need to make these memories visible, many of them linked to experiences of migration, agricultural work, and landscape care, constitutes a form of symbolic resistance and reconstruction of the identity bond with the territory (Satchwell et al., 2024; Bustamante-Toro & López-Castaño, 2024). In this sense, participatory methodologies that recover narratives and generate shared representations are central strategies for re-signifying rural areas from the perspective of their own inhabitants (Nogales-Muriel, 2023). This approach also requires an ethical commitment that recognizes power asymmetries and ensures safe environments for sharing experiences, especially when working with migrant populations (De Kock et al., 2025).

In this study, we understand rural memory as a dynamic network of stories, emotions, and localized knowledge that communities construct through their ways of inhabiting place. In this article, the term ‘territory’ is used in a relational and experiential sense, referring to lived rural geographies shaped by social relations and collective memory, rather than to administrative, colonial, or militarized conceptions of space. Such memory is multisensory, relational, and cumulative, incorporating experiences of work, migration, intergenerational ties, and environmental transformations (Satchwell et al., 2024). As Nogales-Muriel (2023) points out, rural memory functions as a living archive that allows us to re-signify the rural in contexts of eco-social crisis, articulating the past, present, and possible futures. Within the approach of *sensitive cartographies*, this memory constitutes an affective and political substrate that is activated through artistic practices and participatory mapping processes.

Artistic research offers methodological frameworks that allow for the integration of aesthetic, affective, and symbolic dimensions in the production of knowledge (Brann-Barrett, 2009; Duxbury et al., 2018). In particular, A/r/tography articulates art, pedagogy, and research to explore embodied experiences and promote intergenerational and community dialogues, especially in territories at risk of marginalization (Crawshaw & Gkartzios, 2017). From a critical pedagogy perspective, these practices are oriented toward processes of consciousness, participation, and social justice (Freire, 1970), and when articulated with service learning, they allow for a transformative connection between university education and territorial commitment (Chang & Kuo, 2021). In the university setting, critical pedagogy provides the necessary scaffolding for students to adopt an ethical and reflective position towards the territory, developing awareness of rural inequalities and recognizing community knowledge as legitimate knowledge. In the Service-Learning project, this approach translates into dialogic learning—learning with and not about communities—which strengthens listening skills, social responsibility, and territorial commitment, in line with transformative education oriented toward social justice (Chang & Kuo, 2021; Freire, 1970).

Based on this approach, it is necessary to explain how these three pillars are articulated within the sensitive cartography approach. First, artistic practices operate as epistemic and affective mediators, facilitating forms of situated knowledge that emerge from embodied experience and sensitive links with the territory (Ahmed, 2004; Pink, 2009).

Second, critical pedagogy provides the dialogical and reflective scaffolding that allows for the collective interpretation of these experiences and the questioning of inequalities present in rural territories (Freire, 1970). Finally, participatory methods support the co-production of knowledge, ensuring that students, rural inhabitants, and migrants actively participate in defining and re-signifying the territory (Saravia-Ramos et al., 2021). This coherent articulation between art, critical pedagogy, and participation underpins the transformative potential of sensitive cartographies.

In response to this question, in the study, we adopt this interdisciplinary perspective to analyze how sensitive cartographies can generate spaces for listening, agency, and territorial re-signification in a rural context affected by depopulation. The study is situated at the intersection between art, social research, and community education, exploring the potential of participatory mapping as a device for memory, representation, and collective action.

Based on this framework, we understand that the participatory approach mobilizes four interrelated analytical dimensions that allow us to delve deeper into these processes. First, the experiential dimension, which collects stories, experiences, and localized knowledge linked to rural memory and migratory trajectories. Second, the relational dimension, which emerges from intergenerational interactions and the bonds between students, rural inhabitants, and migrants, promoting forms of mutual learning. Third, the affective dimension, linked to emotional ties to the territory and the atmospheres that shape the embodied experience of the place (Pink & Sumartojo, 2023). Finally, the propositional dimension, which allows participants to imagine and project possible futures for their communities, giving the mapping a transformative orientation. Together, these four dimensions structure the subsequent analysis and allow us to understand participatory cartography as a situated process that articulates memory, identity, and territorial agency.

From this conceptual basis, we pose the following research question:

How can social cartography, in combination with artistic and pedagogical practices, act simultaneously as a research methodology and as a tool for community activation in rural contexts affected by depopulation?

2. Method

2.1. Participants, selection, and recruitment process

In order to address the research question of the study, the cartographic project “Pebbles of Memory. Voices of Forgotten Castile” relied on the voluntary and collaborative participation of two analytically differentiated groups. These groups are analytically differentiated for methodological purposes; however, they are not understood as mutually exclusive categories, as many migrants are current or former rural inhabitants whose life trajectories remain closely connected to rural communities.

The first group consisted of 25 students enrolled in the university's education program (BLINDED). The demographic and academic characteristics of this group are detailed in Table 1.

The second group consisted of rural migrants, selected according to the following inclusion criteria, summarized in Table 2: being 18 years of age or older; having resided for at least a decade in municipalities in the province of (BLINDED) affected by depopulation; maintaining permanent residence in those municipalities or retaining family ties with their inhabitants; and participating voluntarily in the study. The sample was structured into three generational groups (young people aged 18–35, middle-aged people aged 36–60, and older people aged ≥61) and by economic sector (students, primary sector, secondary sector, and tertiary sector), in order to gather diverse voices in terms of age and work experience. Regarding the use of the term *migrants*, it is important to note that not all rural people used this category systematically; more contextualized terms appeared (“the kids who have left,” “the people

Table 1
Profile of university students (BLINDED).

Category		Value
Gender	Male	1 (4 %)
	Women	24 (96 %)
Age	Age range	19–40
	Average age	22.64 years
	Fashion	22
	Standard deviation	3.904 years
	25th percentile	21.50 years
	50th percentile (median)	22 years
Course	75th percentile	22.50 years
	2	2 (8 %)
	3rd	7 (28 %)
	4	6 (24 %)
	5th (Double Degree)	10 (40 %)
Degree	Double Degree	21 (84 %)
	Early Childhood Education	4 (16 %)

Source: own elaboration

Table 2
Rural migrants.

Generation (years)	Occupation	Women	Men	Total
Young people (18–35)	Student	5	4	9
Middle-aged (36–60)	Primary sector	6	6	12
	Secondary sector	6	7	13
Seniors (61–100)	Tertiary Sector	30	26	56
Total		47	43	89

Source: own elaboration

from outside”), which shows that “migrant” is, above all, an institutional and academic construct. Recognizing this difference allowed us to reflect on the analytical and ethical implications of the term, avoiding the naturalization of categories external to local experiences.

Note. Generational groups (18–35, 36–60, ≥ 61) follow the standard age classification used in rural studies. Occupation categories (student, primary sector, secondary sector, and tertiary sector) refer to the predominant economic sector in the life trajectory of the interviewees, although in some cases they were retired at the time of the fieldwork.

Within this framework, students from (BLINDED), through a Service-Learning project linked to the subject of **Artistic Expression Resources**, acted as cartographers in rural areas of the province of (BLINDED). Their work consisted of interviewing 89 people related to

the phenomenon of rural exodus and collecting symbolic images linked to identity and territory, with the aim of highlighting rural identity, strengthening community ties, and contributing to reducing inequalities in territories marked by depopulation. The interviews were recorded, edited into individual pieces, and linked to a QR code embedded in a symbolic photograph that included a stone provided by the interviewee, so that scanning each photograph gave access to an identity narrative.

The Service-Learning project was not initially designed as a research study, but is a regular part of the university course, whose main purpose is for students to design creative socio-educational intervention devices in collaboration with community agents. The research was subsequently based on the activities carried out within this framework, integrating itself in a respectful and non-intrusive manner as an analytical process derived from an ongoing community action, without conditioning the pedagogical objectives or the dynamics of the project.

The collection of 89 photographs was presented in an exhibition at the Museum of Contemporary Art (BLINDED), entitled (BLINDED), which opened on February 7, 2024, by the region's institutional and cultural authorities, researchers, and the 89 participants in the study, who also acted as cultural mediators, explaining the cartography to the attendees (Fig. 1).

With regard to the production of audiovisual materials, the participants played an active role in all phases of the process: they took most of the photographs and video clips, chose the visual motifs they considered most representative of their experience, and decided which images to authorize for public use. During the sessions, they collectively selected frames, objects, and scenes, while the teaching team limited itself to providing basic technical support. The groups themselves proposed the short texts that accompanied the images, validated the overall narrative of the exhibition, and agreed on the final layout of the materials, so that the exhibition was configured as an exercise in co-authorship in which the participants maintained aesthetic, narrative, and symbolic control over their representation.

Likewise, the participation of the visual artist linked to the final exhibition was the result of a previous inter-institutional collaboration between the university and the museum. Her role was that of creative mediator, facilitating the selection and exhibition of the materials produced in the workshops, without intervening in the content generated by students, rural inhabitants, and migrants. In this way, the exhibition functioned as a public feedback device consistent with the participatory and situated approach of the project.

The exhibition was conceived as a space for community feedback and validation, allowing the results to be shared in an accessible format,



Fig. 1. The exhibition.
Source: Property of the authors

generating dialogue with citizens, and strengthening the link between memory, territory, and collective action. Guided tours and educational mediations co-designed with participants reactivated the productions made in the workshops and encouraged students, rural inhabitants, and migrants to collectively reinterpret their own stories, turning public feedback into a form of co-production of knowledge.

To establish contact with rural migrants, the research team developed a combined access process that did not depend on the students' personal networks. First, formal coordination took place with city councils, cultural associations, and community agents in the selected municipalities, who facilitated the initial approach and validated the relevance of the project. Based on this institutional contact, the students visited the municipalities accompanied by teachers or local mediators, presenting the project and requesting participation in a public and open manner. This strategy avoided biases derived from selection based on personal affinity and ensured that participants voluntarily decided to take part in the study.

Regarding roles and ethical considerations during recruitment, the research team adopted a position of accompaniment rather than direction. The presence of teachers and researchers was supportive and caring, avoiding intervention in the expressive dynamics or conditioning participation. Voluntariness, anonymity, and the right to withdraw at any time were emphasized, collectively explaining the purpose of the project and the use of the materials generated, and ensuring procedural informed consent. This ethical position sought to maintain a balance between facilitating access and respecting the autonomy of the participants.

In accordance with the profiles of the participants, a mixed sampling strategy was used, combining: (a) census sampling for university students, thus ensuring the inclusion of all experiences within the project, and (b) purposive sampling (Ruiz, 2012) for rural migrants, with age segmentation to gather multiple generational views on rural identity and the sense of belonging. This approach favored a comprehensive analysis of both the students' experience and the migrants' perceptions of participatory mapping and art as instruments of social inclusion and sustainability.

In relation to the study design, the research question, methodological phases, and general procedures were developed by the research team within the framework of an institutionally approved university project, so there was no full co-responsibility in the initial design. However, students, rural inhabitants, and migrants participated in relevant operational decisions: adaptation of creative dynamics, selection of visual materials, formulation of some workshop devices, and validation of emerging interpretations, moving towards a collaborative and situated logic despite structural limitations (academic timelines, ethical requirements, rotation, and vulnerability on the part of the migrant group).

2.2. Study design

Based on the objectives set and in line with the interdisciplinary nature of the project, a mixed and interpretative approach was adopted, combining qualitative and quantitative techniques in order to obtain a deep and multidimensional understanding of the phenomenon analyzed (Hsieh & Shannon, 2005). The adoption of the sensitive cartographies framework responded to the need to articulate methodologies capable of capturing lived memories, affections, and territorial links that are difficult to grasp through exclusively structured techniques. In this study, A/r/tography is understood as a research-creation methodology that informs the artistic and pedagogical dimension of the project, while sensitive cartographies provide the broader analytical and conceptual framework. More specifically, A/r/tography is defined as a research-creation methodology that performatively integrates the roles of artist, researcher, and teacher, articulating processes in which aesthetic production, reflective inquiry, and the pedagogical dimension occur simultaneously. From this framework, knowledge is not conceived

as a result separate from practice, but as something that emerges in action and in the relationship with the participants, in line with situated and dialogical research approaches.

Therefore, the mixed design strengthened the analysis by enabling triangulation between interviews, audiovisual materials, social mapping workshops, as a form of participatory mapping, and structured questionnaires, integrating different levels of information and allowing for a more complete understanding of migratory and intergenerational experiences. From a qualitative perspective, interviews were conducted with a total of 89 people linked to rural exodus, which allowed for the exploration of the lessons learned, difficulties, and impacts perceived in the community environment and in the training process. The students who participated in the Service-Learning project received 10 h of theoretical and practical training on accessing interviewees, constructing key questions, active listening, and empathy, in order to ensure respectful and consistent data collection. In addition, this group completed a structured evaluation questionnaire with a linear scale, which allowed for a summary analysis of their overall perception of the project, their assessment of the activities, the impact of the service on the migrant community, the lessons learned, the support received from the teaching staff and the collaborating entity, and the degree of involvement of the students themselves.

2.3. Data analysis and fieldwork

The fieldwork was carried out in five successive phases that included data collection, processing, and qualitative and quantitative analysis (Fig. 3).

Phase 1: Data collection. Between September 2023 and February 2024, a group of university students conducted 89 interviews in 49 locations in the province of (BLINDED), selecting participants through purposive sampling based on criteria of gender, age, and occupation diversity (Ruiz, 2012). Subsequently, between February and March 2024, the research team interviewed the students, who completed the standardized project evaluation questionnaire.

In order to collect the participants' narratives, semi-structured interviews were conducted with both groups. These interviews, guided by a set of open-ended and flexible questions (Table 3), were complemented by the evaluation questionnaire for the students, following the triangulation procedure summarized in Table 4.

From an ethical perspective, a reflective and situated stance was adopted that recognizes the structural inequality between researchers, university students, and rural migrants (see Table 5). Priority was given to creating safe and dialogical environments, using accessible language in explaining the project, and respectfully returning the results in culturally meaningful formats. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the University of (BLINDED) (PI 23-3402 NO HCUV, November 2023); all participants gave informed consent, and additional measures of confidentiality and professional support were incorporated.

Table 3

Dimensions and questions proposed in the interview.

Dimension	Main questions
Assessment of the project's development; subjective perception.	What would you highlight about the project? How did you feel during the project?
Level of methodological suitability of the activities; perception of difficulty, understanding, and suggestions for improvement	What have you learned about cartography and action art? What would you change if you had to redo this project?
Contribution of the project to the environment	- What difficulties did you encounter? - What have you learned through interaction?

Source: own work

Table 4
Process of triangulation of instruments and participants within the Service-Learning project (Aprendizaje-Servicio, ApS).

Participants	Instruments	Data collection	Objective
ApS students	Questionnaire	After the process of constructing the cartography	Analyze the ApS project in relation to the following questions: 1. General perception of the project 2. Relevance and suitability of the activities 3. Impact of the service on the migrant community 4. Lessons learned 5. Involvement of teachers and the association and level of student involvement.
ApS students	Interviews	After the process of constructing the cartography	Gain in-depth knowledge of the learning, difficulties, and impacts achieved.
Rural Migrants	Interviews	During the mapping process.	Learn about different generational perspectives on rural identity and sense of belonging

Source: own elaboration

Table 5
Evaluation of the questionnaire administered to students.

Aspect evaluated	Frequency (n)	Percentage
Learning about cartography	9	36
Cultural visibility achieved	20	80
Notable social impact	9	36
Strengthened family and intergenerational ties	7	28
Meaningful emotional connection	2	8
Overall visibility of the project	1	4

Source: own elaboration

Phase 2: Transcription and initial data processing. All interviews were recorded and transcribed verbatim, incorporating field notes and a preliminary coding. As part of the project, students edited 3-min audiovisual pieces per interview and linked them to a QR code, generating

a visual cartography of rural exodus through symbolic images provided by the participants themselves (Fig. 2).

Phase 3: Qualitative analysis. The responses obtained through the interviews were analyzed using the Grounded Theory approach (Jayalath, 2023), employing content analysis techniques for systematic categorization using ATLAS.ti software. This approach allows for the identification of thematic patterns, recurring concepts, and implicit meanings in the participants' discourse. Inductive analysis allowed the emerging categories to arise directly from the data, without being conditioned by previous theoretical frameworks, and made it possible to capture the essence of shared perceptions and experiences, providing a deep understanding of the topics addressed through an analytical triangulation of instruments and participants (Table 4).

The analysis was performed using ATLAS.ti (v.25.0.1) and consisted of open coding, which allowed for the identification of key concepts and emerging patterns, and axial coding, where categories were reorganized to establish hierarchical relationships and a central node. This iterative process facilitated a detailed examination of generational differences and emotional ties to the territory.

Phase 4: Quantitative analysis. The questionnaire data were processed using IBM SPSS (v.28), applying descriptive statistics, reliability analysis (Cronbach's alpha), and nonparametric tests (Kruskal–Wallis, Chi-square), as well as Pearson correlations and contingency tables to explore relationships between student involvement, perception of difficulties, and project evaluation.

Phase 5: Validation and reliability strategies. To ensure the quality of the study, strategies were implemented for triangulation of sources, validation of results with participants, and external auditing by an independent researcher (Tracy, 2021).

Phase 6: Exhibition at (BLINDED). On February 7, 2024, the *Pebbles of Memory* exhibition opened at (BLINDED), with the participation of the interviewees, the research team, and the artist. In order to clarify the analytical architecture of the study, a diagram is included that relates the objectives, methodological procedures, and main findings (Fig. 3).

3. Results

This section presents the main findings derived from the analysis of the social mapping processes developed in the sensitive cartography



Fig. 2. Mapping of a woman.
Source: Property of the authors

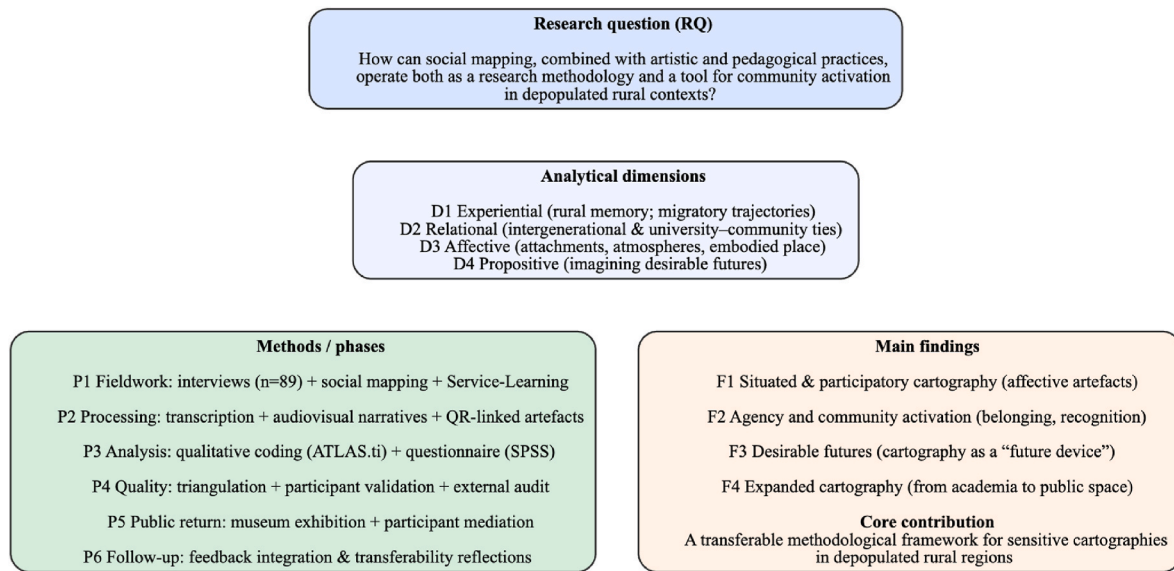


Fig. 3. Diagram sensitive cartographies: Analytical dimensions, methods, and main findings.
Source: Prepared internally using Graphviz

project implemented in the province of (BLINDED). These practices, articulated within the framework of sensitive cartographies, integrated artistic devices, pedagogical dynamics, and collaborative mechanisms for the production of territorial knowledge. This approach explored the potential of social mapping not only as a data collection technique, but also as a community activation tool capable of mobilizing shared memories, strengthening collective identity, and promoting forms of local agency.

The results are organized into four analytical dimensions: (1) cartography as a situated and participatory methodology; (2) collaborative work and its role in community activation; (3) the symbolic dimension of mapping in the imagination of possible futures; and,

(4) the transition from the academic space to the public space through expanded cartography.

The choice of these dimensions responds to the logic of the analysis and the structure of the empirical material itself. The choice of these dimensions responds to the logic of the analysis and the structure of the empirical material itself. Each dimension synthesizes clusters of emerging codes and patterns detected in the interviews, questionnaire, and audiovisual materials: (1) the situated and participatory dimension allows us to address how mapping operates as an embodied methodology; (2) the collaborative dimension reflects the intergenerational and community dynamics identified; (3) the symbolic dimension arises from codes linked to memory, identity, and future projections; and (4) expanded cartography responds to the need to analyze the transition from academic work to the public space and its cultural impact.

In this organizational process, priority was given to a respectful approach towards the participating migrants, creating safe environments for the expression of sensitive memories and recognizing their narrative agency, in line with the ethical principles of De Kock et al. (2025).

3.1. Social cartography as a situated and participatory methodology

The use of participatory cartography in the *Pebbles of Memory: Voices of Forgotten Castile* project demonstrated its potential as a methodology situated within the framework of sensitive cartographies, articulating artistic and pedagogical practices informed by A/r/tographic principles, in combination with community-based methods. Integrated into an interdisciplinary approach oriented toward sustainability, this methodology allowed for the exploration of rural identity, sense of belonging,

and the effects of exodus in depopulated communities.

Analysis of interviews with rural migrants and students showed that the mapping process facilitated an emotional and symbolic reconnection with the territory of origin. The narratives coded under *affective memory* and *territorial reconnection* express this dimension:

"I lived in a time when the village was everything [...] Even if those who left return, it is no longer the same" (M8-W-70).

This ambivalence between nostalgia and loss also appears in younger generations:

"I would like to live in the village, but I would also like it to offer the opportunities of the city" (M12-W-28).

For middle-aged people, cartography served as an exercise in identity recovery:

"Participating in cartography has helped me appreciate where I come from" (M18-W-39).

The students expressed an awareness of the territory linked to memory and identity:

"The village is not just a place, it is part of who I am" (M47-M-35).

The questionnaire data (Table.

5) supports this formative dimension: 80 % rated the cultural visibility achieved positively, 36 % highlighted cartographic learning, and 28 % identified strengthened family ties. Some migrants emphasized the symbolic value of public restitution:

"Seeing my history reflected made me feel that our struggle for recognition has a place" (M29-W-64).

However, limitations in participation also emerged, linked to generational differences or the handling of audiovisual devices:

"I wanted to say more, but sometimes I feel like I don't know how to explain myself like young people do. I'm from another time, more of the plow than the phone" (M42-W-67).

3.2. Collaborative work and its role in community activation and social empowerment

The dynamics generated throughout the sensitive cartography

project showed that participatory cartography acted not only as a research tool, but also as a device for community activation. The collaboration between rural migrants and students from the University of (BLINDED) fostered intergenerational links and shared reflection on depopulation.

The final exhibition at the Museum of Contemporary Art (BLINDED) served as a space for public recognition. As one older participant described:

"When I heard the young people talk about what they had learned from us, I felt that, finally, our history mattered for something more than just remembering it in silence" (M33-M-71).

Similarly, the students emphasized the educational value of the narratives collected:

"Cartography allowed me to understand that migrants' stories are not just tales, but experiences that shape the identity of an entire region" (S20-M-22).

This intergenerational encounter generated mutual learning that transcended the academic dimension, giving rise to significant emotional and social involvement.

The quantitative evaluation of the APS project (Table 6) confirmed these trends: 84 % of students considered the methodology useful or very useful, and 36 % rated it as enriching and motivating. In addition, 84 % indicated a strengthening of support and collaboration networks. However, the data also showed significant differences in personal involvement depending on the academic year ($H = 8.682$, $p = 0.034$), with greater involvement in higher years (Table 7).

This finding does not allow us to conclusively state that the methodology should necessarily be incorporated into the first levels of university, but it does suggest that early introduction could favor the progressive development of skills linked to participatory research, active listening, and territorial interpretation. In advanced courses, students showed a greater ability to contextualize migratory experiences and relate them to processes of sustainability and social justice. Therefore, without presenting it as a proven conclusion, the results point to the pedagogical convenience of integrating this type of methodology from the initial stages, allowing for a broader educational journey that is more consistent with the principles of situated education.

3.3. Social cartography, symbolic visibility, and imagination of the future

The participatory social cartography developed within the sensitive cartography framework fostered a symbolic reinterpretation of the rural territory, allowing experiences of migratory uprooting to be transformed into meaningful narratives articulated from personal experience. The narratives collected showed clear differences between the participating groups—especially between generations—which enriched the analysis of rural identity and the relationship with the territory.

The axial coding analysis revealed that this methodology not only

Table 6

Assessment of the impact of collaborative work and difficulties identified in the APS project.

Aspect evaluated	Frequency (n)	Percentage
Methodology useful or very useful	21	84
Enriching and motivating experience	9	36
Strengthening of support and collaboration networks	21	84
Technical difficulties (editing audiovisual materials)	5	20
Difficulties in finding migrant interviewees	3	12
Proposal for longer and more in-depth interviews	2	8
Logistical and organizational problems	3	12
Suggestions for improvement regarding clarity and organizational guidelines	4	16

Source: own elaboration

Table 7

Results of the Kruskal-Wallis test on personal involvement according to academic year.

Academic Year	No.	Range Mean	Perceived Level of Involvement
1st Year	6	8.58	Low
3rd Year	5	9.20	Moderate
4th Year	7	15.29	High
5th Year Double Degree	7	15.93	High

*Test statistic ($H = 8.682$, $p = 0.034$).

Source: own elaboration

recovers collective memory, but also contributes to reconfiguring the territorial link and reinforcing rural identity. A 28-year-old man (M12-W-28) expressed this tension between desire and loss:

"To be honest, when I left the village, I never imagined I would miss it so much. [...] I would like to live in the village, it's true, but I would also like the village to offer me the opportunities of the city, and that's difficult; unfortunately, you have to choose."

A 39-year-old migrant (M18-W-39) elaborated on the identity dimension:

"Participating in the mapping has helped me to value my identity, to remember where I come from, and to be grateful for everything [...] I am a citizen of a homeland that no longer exists, but as long as I live, it lives on inside me."

These processes also resonated with the students, who identified ethical and emotional learning:

"It's amazing how such simple stories [...] have such depth. [...] Our responsibility now is to give voice to those stories so that future generations can understand them" (S12-W-20).

In addition to the symbolic component, the impact of this tool has been quantified based on the analysis of the APS questionnaire administered to participating university students. As shown in Table 8, 80 % rated the cultural visibility achieved positively; 36 % identified social impacts and specific learning in cartography, and 28 % highlighted the creation of family and intergenerational bonds. These data reinforce the formative and transformative dimension of participatory cartography, especially in the context of education for sustainability.

The narratives also showed how mapping facilitates imagining possible futures for rural areas. As a 21-year-old student (S-34-M-21) pointed out:

"Listening to the stories of migrants and seeing the physical and emotional reality of depopulation, I have understood that the problem is not only social, but [...] a struggle to maintain the identity of a place."

Taken together, these accounts show that participatory cartography operates as a symbolic device that articulates memory, identity, and future projections, promoting both individual recognition and collective imagination of alternatives for rural areas.

Table 8

Assessment of the impact of social mapping on the recovery of rural identities and cultural visibility.

Aspect evaluated	Frequency (n)	Percentage
Learning about mapping	9	36
Positive assessment of cultural visibility achieved	20	80
Outstanding social impact (social footprint of the project)	9	36
Family impact (intergenerational ties and dialogue with the community)	7	28
Meaningful emotional connection	2	8
Visibility as a general effect of the project	1	4

Source: own elaboration

3.4. Expanded cartography: from research to public space

Following previous work on expanded cartography (Duxbury et al., 2018; Ramon & Alonso-Sanz, 2022), this transition refers to the movement of cartographic practices from academic research contexts into the public and cultural sphere. Rather than merely representing the territory, the cartographic process materialized in an exhibition installation at the Museum of Contemporary Art (BLINDED), integrating interviews, symbolic photographs, and audiovisual narratives produced by the participants themselves. This public feedback not only disseminated the results of the study, but also positioned rural migrants as authors rather than objects of research.

The co-created museum narrative reinforced the sense of belonging and legitimized migrant voices in an institutional space. As one participant put it:

"Knowing, seeing how my voice, my story is included in a project like this, understanding that young people see what is happening, gives me hope that something will change" (M3-W-42).

The photographic and audiovisual exhibition strategy gave symbolic visibility to the stories collected, generating community resonance beyond the museum. One participant highlighted this emotional and social impact:

"If a picture is worth a thousand words, 89 living images, with a voice and a vote, have a significant impact, not only on myself, but also on my grandchildren, on the village, on life itself. [...] I have written my own account of the experience and shared it; I have sent it to the mayor" (M41-W-52).

These expressions show how the transition from research to public exposure favors the transformation of the individual story into a collective story, activating processes of recognition and community agency. In this sense, expanded cartography functions as a political, aesthetic, and pedagogical device that challenges dominant imaginaries about rural areas and opens spaces for alternative narratives constructed by those who inhabit or have inhabited these territories.

4. Discussion

Based on the analysis of qualitative and quantitative data, this discussion brings the findings into dialogue with the theoretical frameworks reviewed, allowing us to identify methodological, educational, and community contributions emerging from the voices of the participants themselves. The discussion does not validate hypotheses, but rather offers a critical reflection on the meanings and possibilities of social cartography in rural territories affected by depopulation. In line with De Kock et al. (2025), this type of research requires an ethical commitment that recognizes power asymmetries and guarantees safe environments for the expression of experiences, especially with migrant or vulnerable populations.

A relevant aspect of the analysis was the diversity of positions among the participating groups. While the students emphasized discovery and territorial awareness, rural migrants articulated narratives focused on uprooting, nostalgia, and identity reconstruction. Older people expressed the affective dimension of the territory more intensely, while young migrants showed tensions between roots and job opportunities. These intergenerational differences show that participatory mapping does not produce a single collective voice, but rather a constellation of situated perspectives that must be interpreted in their plurality.

In this context, it is necessary to qualify the notion of "giving voice." As De Kock et al. (2025) warn, participatory processes are never free of asymmetries: narrative authority continues to be mediated by institutional frameworks and methodological decisions. Furthermore, generational and technological differences conditioned the agency of the participants, in line with Pink's (2015) reflections on the situated nature of all ethnographic practice and with the limitations pointed out by

Saravia-Ramos et al. (2021) in social cartographies. Thus, rather than "giving voice," the project opened spaces for listening and partially redistributed interpretive authority, assuming that participation is always relational and situated.

The experience confirmed the potential of social cartography as a situated and participatory methodology. Migrants and students recognized the value of mapping as a practice rooted in lived experience. This approach, consistent with Calvo and Candón-Mena (2023), moves away from neutral cartographic representations to construct an emotional geography of the territory. The integration of stories, objects, drawings, and installations added affective and aesthetic dimensions absent in studies based solely on georeferenced data (Eilola et al., 2019). Methodologically, and following Escaña and Mañero (2025), the combination of visual, performative, and ethnographic instruments reinforces an embodied and situated epistemology. From an educational perspective, the students stopped observing the rural environment as an object of study and began to recognize themselves as part of the territorial fabric, strengthening a logic of "research with" rather than "about" (Saravia-Ramos et al., 2021), one of the key principles of **sensitive cartography**.

The second dimension refers to the capacity of mapping to imagine possible futures. The materials analyzed show that participants not only describe their territory, but also project desires, fears, and strategies for the future, in line with the notion of activating imaginaries proposed by Duxbury et al. (2018). This anticipatory dimension turns cartography into a symbolic and political tool capable of activating horizons of hope. Works such as those by Carrión and Albert (2022) or Sabatini et al. (2024) support the idea that these practices allow us to outline alternative ways of inhabiting rural areas, strengthening symbolic appropriation and territorial identity.

Finally, the transition from the research space to the public space was achieved through what Ramon and Alonso-Sanz (2022) call expanded cartography. Exhibitions in museums and cultural centers allowed the results to circulate beyond the academic sphere, generating cultural resonance and engaging in dialogue with diverse audiences. This public feedback, supported by artistic devices, fostered processes of recognition, cohesion, and territorial justice, in line with Zhuang et al. (2022) and Song et al. (2024). The physical presence of the maps in community spaces stimulated intergenerational conversations and reinforced identity pride.

Taken together, the findings show that the *Pebbles of Memory* project offers clearly identifiable theoretical, methodological, and practical contributions to social research in rural contexts. In theoretical terms, the study contributes to consolidating the framework of *sensitive cartographies*, showing how they articulate affect, memory, and belonging in depopulated territories and broadening the understanding of cartography as an emotional and relational device. Methodologically, the project demonstrates the power of integrating social cartography, artistic languages, service learning, and mixed analysis, offering a replicable procedure that combines interviews, audiovisual narratives, collaborative mapping, and questionnaires, and reinforces the triangulation and ecological validity of the process. In practical terms, the study shows how participatory cartography can activate community networks, strengthen intergenerational ties, and generate public feedback processes—such as museum exhibitions—that consolidate symbolic recognition and local agency. The articulation of these elements made it possible to gather diverse voices, produce situated knowledge, and broaden community impact, reaffirming the strength and relevance of the approach.

5. Conclusions

The *Pebbles of Memory* study synthesizes several relevant contributions to social research in rural areas affected by depopulation.

First, social cartography integrated with artistic and educational practices is confirmed as a central device in the framework of *sensitive*

cartographies, capable of generating situated and participatory knowledge. The results show that the map acts as an emotional and symbolic support, gathering diverse experiences, from the nostalgia of older people to the tensions between roots and opportunity expressed by young migrants, and facilitating processes of territorial and identity reconnection.

Second, collaborative work strengthened the link between the university and the community, generating horizontal relationships that fostered mutual recognition between academic and local knowledge. This dimension appears both in testimonies of identity recovery and in the APS questionnaire data, where 84 % of students rated the methodology positively and 28 % highlighted the strengthening of family and intergenerational ties. This approach consolidated processes of community empowerment and critical training.

Thirdly, participatory mapping operated as a “device for the future,” allowing participants to project alternative scenarios for rural life. The presence of categories such as “*desirable future*” indicates that mapping not only documents the territory but also enables shared imaginaries that redefine rural life from a perspective of hope and agency.

Finally, expanded cartography, through public exhibition, reinforced symbolic recognition and the community circulation of knowledge. The possibility of seeing their stories in a culturally legitimized space translated into experiences of pride and belonging. This process generated dynamics of social cohesion, intergenerational memory, and cultural activation.

Overall, the study provides evidence of the capacity of sensitive cartographies to operate simultaneously as a research methodology and as an educational, community-based, and political tool in rural territories affected by depopulation. Its results point to new avenues for research committed to the territories, aimed not only at understanding rural reality but also at accompanying local processes of transformation.

5.1. Limitations of the study and future lines of research

This study has limitations inherent to its qualitative and contextual design. Although the findings provide insight into relevant identity and educational dynamics, they should be interpreted with caution, given that the work was carried out in a specific territory, the province of (BLINDED), with specific demographic, cultural, and socioeconomic characteristics. Therefore, the transferability of the results should not be understood as a generalization, but rather as an analytical resonance applicable to territories experiencing similar processes of depopulation and migration.

In addition, the study has other specific limitations. The research is confined to a single province, which restricts the territorial scope of its contributions; the methodology used does not allow for the evaluation of long-term effects or the sustained impact of public exposure, which had a limited lifespan and no subsequent follow-up; and the use of artistic languages introduces an inevitable degree of subjectivity, which not all participants were able to address on equal terms. There is also an imbalance in representation between groups, especially among students, who are mostly female, which may have influenced the diversity of perspectives collected. Finally, the active role of students in data collection and interpretation, while valuable in terms of training, may have introduced certain biases into the analytical process.

Looking ahead, it would be valuable to replicate this type of experience in rural areas with different socio-ecological configurations, which would allow for an evaluation of the adaptability of the *sensitive cartography* approach to other contexts. It is also proposed to develop longitudinal studies that allow for monitoring the evolution of the identity, social, and educational effects generated, as well as exploring expanded cartographies in digital environments, including augmented reality or interactive collaborative mapping. Finally, it is considered essential to deepen the intersection between art, critical pedagogy, and territory from decolonial and participatory approaches that recognize and value the situated knowledge of rural communities.

CRedit authorship contribution statement

Victoria Martínez-Várez: Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Fátima Cruz-Souza:** Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Project administration, Methodology, Investigation, Funding acquisition, Data curation. **Paula Gil-Ruiz:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **y Carlos Córdoba Cely:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Data curation.

Ethics & integrity declaration

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the University of (BLINDED) (PI 23–3402 NO HCUV, November 2023); all participants gave informed consent, and additional measures of confidentiality and professional support were incorporated.

Statement on the use of AI

The authors declare that no generative artificial intelligence tools were used in the writing, analysis, or production of this manuscript.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The data used in this study are available in ZENODO under the following identifier: <https://zenodo.org/records/14510064>

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