

# Educational Interventions for Peace: Transformation of Perceptions and Construction of Life Projects in Hybrid Learning Ecosystems with Cross-Cutting Impact in Post-Conflict Rural Contexts in Colombia

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## Abstract

*The long history of armed conflict in Colombia has left a deep mark on rural areas, especially affecting young people, who have had to face the direct and indirect consequences of violence, displacement and social exclusion. This article aims to integrate the results of two previous studies conducted in the municipality of Pradera, Valle del Cauca, to explore how educational interventions, particularly hybrid learning ecosystems, can transform perceptions about armed conflict, promote resilience and the development of life projects among young people, and how these results could be replicated in other similar rural contexts. The methodological approach of the studies was mixed, combining surveys and interviews with 114 participants, including students, parents, teachers and local authorities. In the first phase of the research, the particularities, expectations, capacities, challenges and initial perceptions of the armed conflict were evaluated, as well as the socio-emotional conditions of the students. The findings revealed that young people faced significant difficulties in building long-term life projects, due to the lack of resources, opportunities and the emotional impact derived from the conflict. In this initial phase, an intervention focused on socio-emotional accompaniment activities was implemented to address perceptions and emotions related to violence and post-conflict. In a second phase, a hybrid learning ecosystem was implemented that integrated digital tools and face-to-face methodologies. These activities were designed to strengthen both the socio-emotional and cognitive competencies of the participants. Forums, chats, multiple-choice questions, reflective activities, workshops, congresses, group discussions and interactive tasks were carried out, with the aim of promoting critical reflection and dialogue on the experiences of conflict. The results showed a significant improvement in the perception of the armed conflict and in the construction of more resilient life projects among the young participants. The analysis of the data using a linear regression model showed that the hybrid learning ecosystem, by combining face-to-face and digital activities, has a positive impact on perceptions of the armed conflict, improves life projects, and strengthens the socio-emotional skills necessary for peacebuilding in post-conflict rural contexts. This model also turned out to be replicable, suggesting that educational interventions based on hybrid ecosystems can be successfully adapted in other rural communities affected by armed conflict, promoting social inclusion and peacebuilding. This article concludes that educational interventions based on hybrid learning ecosystems are a key tool to transform perceptions of armed conflict, improve young people's life projects, and contribute to peacebuilding in post-conflict rural contexts. It is recommended to continue exploring and expanding these educational innovations, especially those that combine digital and face-to-face components, as they constitute a replicable approach that could be scaled up in other regions affected by similar situations.*

**Keywords:** Hybrid Learning Ecosystems, Peacebuilding In Post-Conflict Rural Areas, Resilient Life Projects, Educational Innovation In Rural Contexts, Socio-Emotional Accompaniment, Educational Public Policies.

## Introduction

The armed conflict in Colombia has left deep scars, especially in rural areas, where violence, forced displacement, and social exclusion continue to be major obstacles to community development (González, 2010). In this context, building lasting peace depends not only on the political resolution of the conflict, but also on transforming individual perceptions of violence and creating new horizons for young generations, who are key agents in social change.

This article examines how hybrid learning ecosystems can contribute to this transformation, particularly in young people's perceptions of armed conflict. By fostering resilience and building life projects, these ecosystems promote both the cognitive and socio-emotional development of students in post-conflict rural contexts (González, 2006; Hernández et al., 2014). Resilience and empathy are key dimensions that allow

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young people to transform traumatic experiences into opportunities for growth and reconciliation (Masten & Barnes, 2018; Salovey & Mayer, 1990).

For young people to overcome the traumatic effects of conflict, it is essential to strengthen their socio-emotional competencies, such as emotional regulation and interpersonal skills. Transforming the perception of the armed conflict and empowering young people to build resilient life projects is, in this sense, essential to strengthen the social fabric and promote reconciliation in affected communities (Herrera & Lozano, 2019; Müller & Leyva, 2010). In rural areas, where educational opportunities are limited, these life projects are closely linked to overcoming barriers such as poverty and social exclusion (Giraldo & Ramírez, 2015).

Based on the theory of the *knowledge space*, which considers the creation of an ontological structure necessary to achieve knowledge, this research proposes that hybrid learning ecosystems can transform traditional pedagogical practices. In this approach, the knowledge space not only defines the learning structure, but also establishes routes that are adaptive, flexible, and focused on the individual needs of students. Hybrid ecosystems, by integrating digital tools and traditional methodologies, make it possible to overcome the geographical and socioeconomic barriers that limit access to quality education in rural contexts (Salinas & Longo, 2017; Núñez & Pereira, 2018). In the municipality of Pradera, Valle del Cauca, an educational project was implemented that used these ecosystems with the aim of transforming young people's perceptions of the armed conflict and strengthening their life projects.

The project, entitled "*Changes in the perception of the armed conflict in students in the rural area of Pradera, Valle del Cauca, based on the evolution of their life projects*", focused on contributing to the construction of peace scenarios, reducing inequality gaps and creating spaces for community participation in Pradera. To this end, a hybrid learning ecosystem was designed that integrated digital technologies (Benítez et al., 2021) and traditional methodologies, in order to generate spaces for reflection and dialogue that would allow students to construct alternative narratives about the conflict. In addition, specific objectives were set such as the understanding of the competencies necessary for learning around the life project, the design of a monitoring system to evaluate the evolution of students and the determination of the role of the actors involved focused on generating spaces for reflection and dialogue through a hybrid ecosystem that combined digital technologies with traditional methodologies.

The study explores the potential of hybrid ecosystems as an innovative strategy to strengthen students' socio-emotional competencies and promote peacebuilding in post-conflict rural communities (Benítez et al., 2024a). It examines how these ecosystems, by integrating digital and analogue tools, can overcome geographical and socio-economic barriers, improving access to education and transforming perceptions of armed conflict. The aim is to empower students to become agents of change in their communities, providing empirical evidence on the effectiveness of this educational model for social transformation and the construction of lasting peace. This approach allowed students to construct alternative narratives about the conflict and project a more hopeful future. Unlike previous research, this study is distinguished by its long-term approach, assessing the lasting impact of hybrid ecosystems on peacebuilding.

This innovative approach, which combines digital and analogue tools, is being studied as a strategy to strengthen students' socio-emotional competencies and promote peace in post-conflict rural communities. It explores the ways in which these ecosystems, by overcoming geographical and socioeconomic barriers, can transform perceptions of armed conflict, empowering students as agents of change. The research also demonstrates how the hybrid ecosystem facilitates the construction of resilient life projects and promotes the autonomy of young people, allowing them to overcome the challenges of the post-conflict context.

The integration of the results of both studies—the analysis of students' capacities, expectations, potentialities, and challenges, together with the implementation of the hybrid ecosystem—has led to a holistic and replicable view of how educational interventions can transform the perceptions of young people in post-conflict rural contexts. The initial analysis identified the social-emotional needs and contextual barriers faced by students, while the implementation of the hybrid ecosystem provided the tools to address those needs through reflection and discussion activities. By integrating both approaches, the effectiveness of the model in the Pradera context is demonstrated, but also a flexible and adaptable framework is

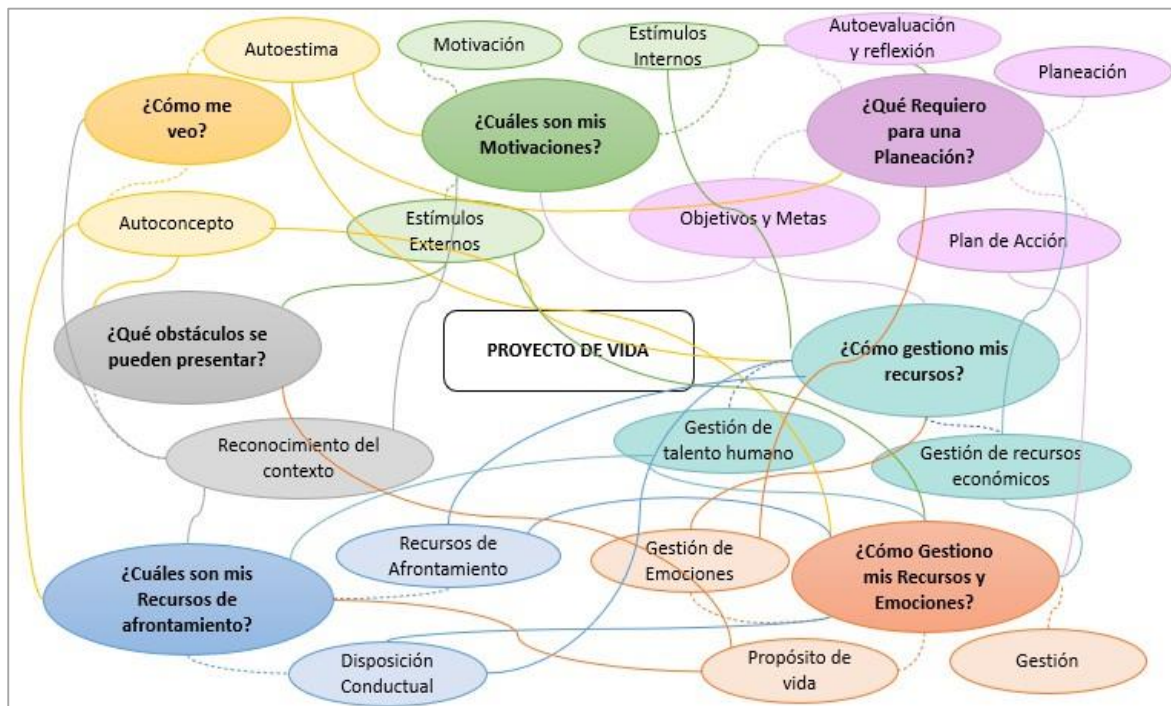
proposed that can be implemented in other rural communities affected by the conflict, as well as in various disciplines and areas of knowledge. This integrated approach offers a replicable methodology that has the potential to transform educational experiences and support peacebuilding in diverse contexts, overcoming geographical and social barriers.

### *Theoretical Framework*

#### *Theory of the Knowledge Space*

The theory of the knowledge space, proposed by Doignon and Falgagne (1985), states that learning is a progressive process through which students acquire fundamental concepts in a sequential manner, Figure 1 shows the concepts and the relationships between them. This allows them to solve specific tasks effectively. This approach facilitates the dynamic assessment of knowledge, adapting educational experiences to the individual needs of students (Falgagne et al., 2013). In rural contexts affected by the armed conflict, this theory is especially relevant, as it allows the identification and strengthening of key competencies that help overcome educational and social barriers, promoting the personalization of learning and the inclusion of students who face socioeconomic disadvantages.

**Figure 1.** Knowledge space. In original language Spanish



#### *Learning Competences Space*

The development of key competences in rural contexts is essential for students to be able to cope with the socio-emotional and cognitive challenges arising from armed conflict. According to Heller et al., (2006), skills such as critical thinking, resilience, and decision-making are essential to train students in problem-solving within their social environment. In addition, concepts such as autonomy, self-esteem, motivation, planning and management are crucial for the formulation and execution of a life project. Based on the knowledge space that allows establishing the relevant concepts and the states of knowledge that in Figure 1 correspond to the questions enunciated, relationships are established between the concepts and the skills required to account for their mastery. In this context, the competency space acts as a matrix that establishes the concepts and actions necessary to solve an activity or problem, Table 1 presents the competency matrix

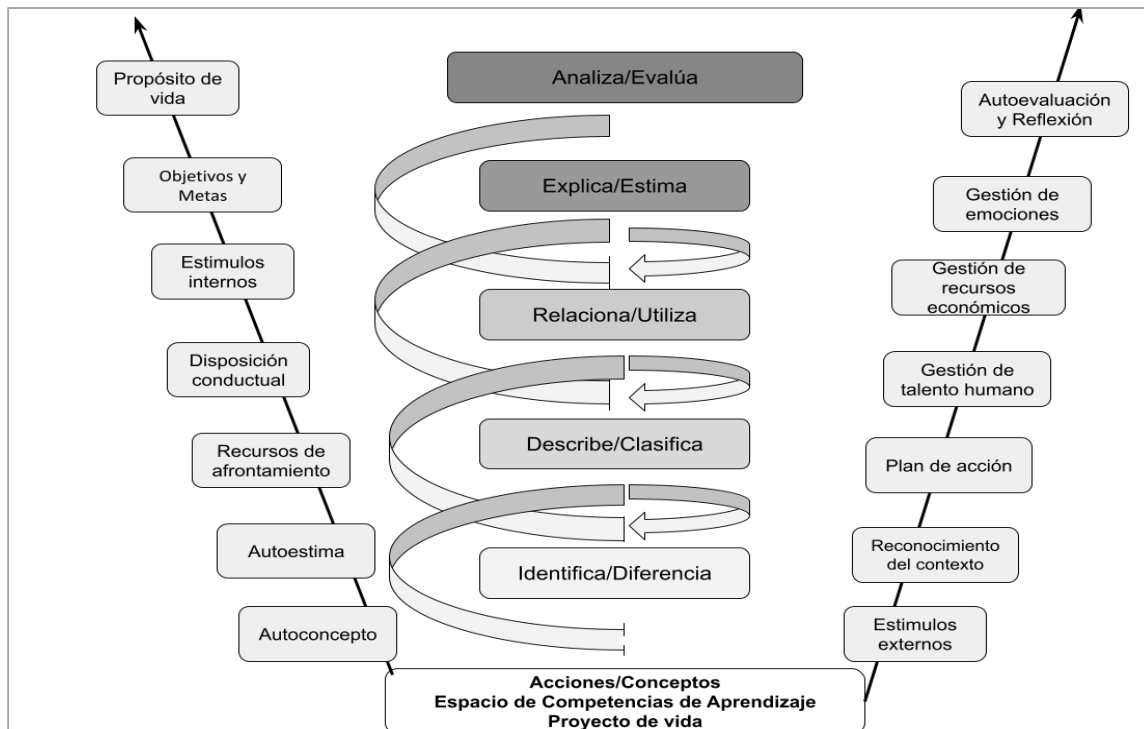
for the life project, which allows for the creation of learning paths adapted to the pace of each student (Benítez, 2023).

**Table 1.** Competence Space Matrix for Learning, In original language Spanish

<i>Acción/Concepto</i>	<i>Identifica</i>	<i>Diferencia</i>	<i>Describe</i>	<i>Clasifica</i>	<i>Relaciona</i>	<i>Utiliza</i>	<i>Explica</i>	<i>Estima</i>	<i>Analiza</i>	<i>Evalúa</i>
<i>Autoestima</i>	x	x	x	x	x	x	x	x	x	x
<i>Autoconcepto</i>		x								
<i>Recursos de afrontamiento</i>	x	x	x	x	x	x	x	x	x	x
<i>Disposición conductual</i>	x	x	x	x	x	x	x	x		
<i>Motivación Interna</i>	x	x	x	x	x	x	x	x	x	x
<i>Motivación Externa</i>	x	x	x	x	x	x	x	x	x	x
<i>Planeación</i>	x	x	x	x	x	x	x	x	x	x
<i>Plan de acción</i>	x	x	x	x	x	x	x	x	x	x
<i>Gestión de recursos</i>	x	x	x	x	x	x	x	x	x	x
<i>Gestión de emociones</i>	x	x	x	x	x	x	x	x	x	x
<i>Elementos del Proyecto de Vida</i>	x	x	x	x	x	x	x	x	x	x
<i>Planeación del Proyecto de Vida</i>	x	x	x	x	x	x	x	x	x	x

### *Mental Models and Conceptual Models*

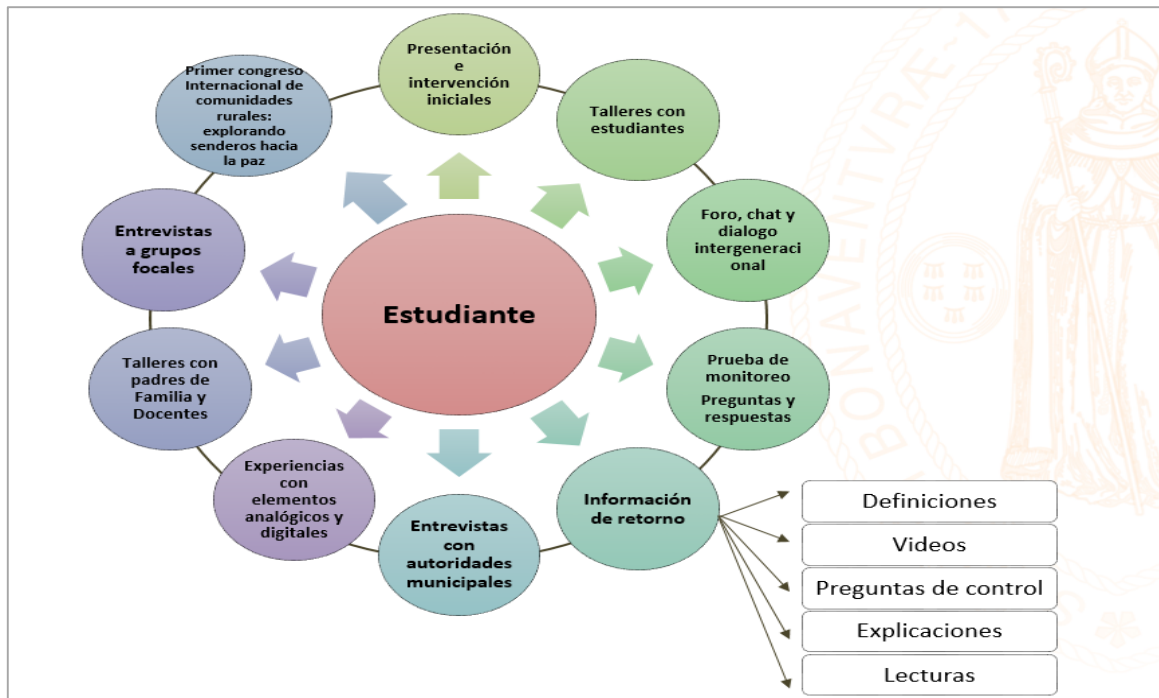
Mental models are internal representations that people develop to interpret their environment and make decisions (Novoa, 2012). In the educational field, these models evolve into conceptual models when students reorganize and transform their ideas into more complex structures aligned with scientific knowledge. This process is key to facilitating the integration of abstract concepts and their application in real situations (Becerra & Benítez, 2019). An effective strategy for assessing the evolution of mental models into conceptual models is to establish progressive levels, such as elementary, basic, inclusive, reconstructive, and prospective. Figure 2 presents the concepts and skills taken into account to observe the evolution of the mental model, from which the activities (resources inserted in the ecosystem) that serve for monitoring are elaborated. These levels serve to monitor progress towards the proposed conceptual model (Benítez, 2023).

**Figure 2.** Implicit Skills at Mental Model Levels. in Original Language Spanish

### *Hybrid Learning Ecosystems*

The term hybrid learning ecosystem refers to an educational approach that integrates digital tools with face-to-face methodologies, creating a flexible space adapted to the individual needs of students. This approach makes it possible to overcome geographical and socio-economic barriers that limit access to quality education, especially in rural contexts. In this study, the hybrid ecosystem is based on the theory of the knowledge space, allowing the organization of key concepts of the life project, such as self-esteem, motivation, planning and management, while integrating socio-emotional competencies necessary for those who live in the post-conflict context (Benítez et al., 2024b). In addition, it combines digital technologies with traditional methodologies, offering an effective tool to encourage the active participation of young people. The integration of educational technologies and collaborative learning dynamics allows students to interact actively, contributing to the construction of new narratives about the armed conflict, Figure 3 shows the general scheme of the hybrid ecosystem (Benítez, 2023).

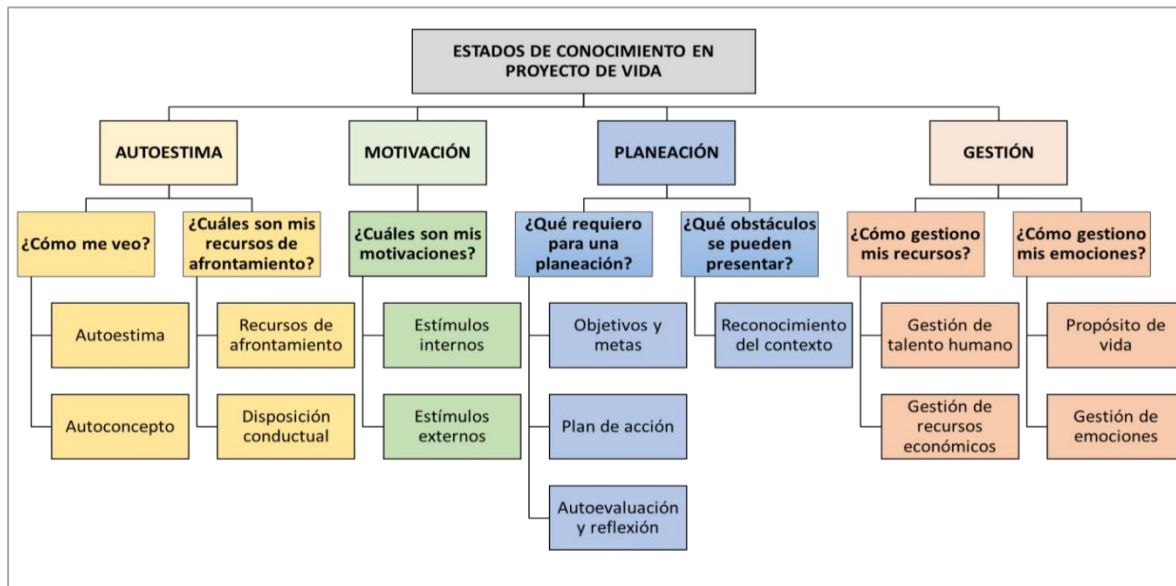
Hybrid learning ecosystems not only seek to improve academic performance, but also to facilitate the development of socio-emotional competencies such as resilience and decision-making, which are essential to face the adversities derived from armed conflict (Stefanutti & Chiusole, 2017).

**Figure 3.** Components of the Hybrid Ecosystem. in Original Language Spanish

### *Life Project*

The concept of life project refers to the personal, academic, and professional goals that guide the integral development of individuals. According to Lomelí et al., (2016), there are four key dimensions in the construction of a life project: self-esteem, motivation, planning, and management. These dimensions are crucial in the post-conflict rural context, where young people face challenges such as poverty, social exclusion and lack of educational opportunities. Self-esteem, motivation, planning and management are essential factors that allow young people to overcome social and emotional barriers, providing them with the necessary tools to build resilient life projects.

In post-conflict settings, building a life project can be particularly challenging due to social and economic barriers. In this sense, hybrid learning ecosystems, by integrating digital tools and interactive activities, play a key role in revitalizing students' aspirations, helping them overcome the aftermath of conflict. González (2006) argues that a well-structured life project not only offers a clear purpose, but also provides a frame of reference that allows young people to face adversity and project a more hopeful future. The key competencies of autonomy, self-esteem and goal-setting facilitate this process. In Figure 4 called states of knowledge, the central concepts are based on the central concepts and from these it is intended that the student solves problem situations by answering each of the questions which in turn are related to other concepts and that allow the organization of the 28 lessons presented in the virtual classroom.

**Figure 4.** States of Knowledge and Concepts of A Life Project . in Original Language Spanish

In the specific context of this study carried out in Pradera, a resilient life project refers to the ability of young people to develop clear and achievable goals in academic, emotional and social dimensions. These projects allow students to envision a future that goes beyond the traumatic effects of armed conflict, helping them to redefine their perspectives and strengthen their self-esteem. Throughout the research, an in-depth reflection on the strengths and limitations of young people was promoted, fostering their autonomy and empowerment in the construction of their futures.

The revised theoretical framework presents a comprehensive approach that encompasses both students' cognitive and socio-emotional competencies. The importance of **hybrid learning ecosystems** to improve education in rural and post-conflict contexts is underlined, providing a flexible structure that supports the academic and emotional development of young people. The **theory of the knowledge space** and the concept of life project offer a solid framework for educational intervention, while mental models and their transition to conceptual models reinforce the need for a deep and critical understanding of the environment, which facilitates learning and resilience in situations of adversity.

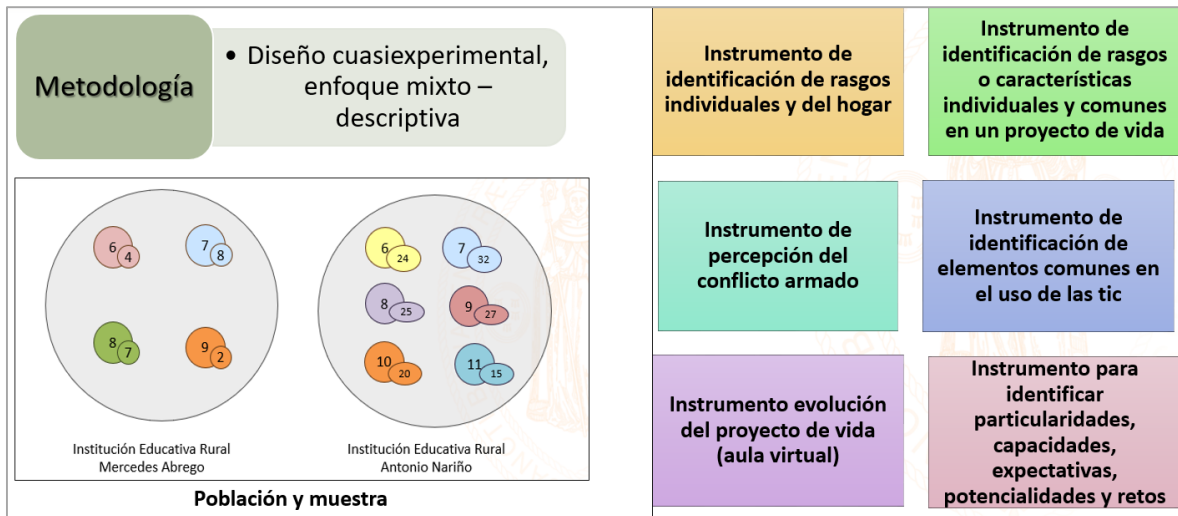
## Methodology

### *Study Context*

The research was carried out in rural institutions in the municipality of Pradera, Valle del Cauca, a region historically affected by the armed conflict. The participants were students from the basic, secondary and middle school levels of the Antonio Nariño and Mercedes Abrego rural educational institutions. The main objective of this study was to evaluate how hybrid learning ecosystems, which integrate digital and analog tools, influence the evolution of students' life projects and the change in their perception of the armed conflict.

### *Research Approach and Design*

The methodological approach adopted in this study was mixed-methods, combining quantitative and qualitative techniques to obtain a comprehensive understanding of the impact of hybrid ecosystems in the rural educational context (Creswell & Plano Clark, 2011). A quasi-experimental design, complemented by interpretive methods, was used to evaluate the effects of the intervention (Shadish et al., 2002). Figure 5 shows the design and focus of the research.

**Figure 5.** Research Approach and Design. in Original Language Spanish

### Data Collection

For data collection, several techniques were used to obtain both quantitative and qualitative information:

- **Surveys:** Applied to a total of 114 participants, including students, parents, teachers and local authorities. The purpose was to assess socio-emotional competencies and perceptions of armed conflict before and after the intervention.
- **Semi-structured interviews:** Conducted to delve into the individual experiences and perspectives of the participants on their personal and academic development, 23 interviews were applied to high school students and previously selected people from the educational community and municipal authorities (Seidman, 2013).
- **Focus Groups:** Made up of eleventh grade middle school students and teachers from the two educational institutions that work in high school, with the aim of facilitating discussion and reflection on the impact of the hybrid learning ecosystem.
- **Participant Observation:** Implemented to capture the dynamics of interaction during face-to-face and digital activities, and to obtain a detailed view of the behaviors and reactions of the participants (Seidman, 2013).

### Study Variables

The research focused on four key variables to assess the impact of the intervention:

- **Number of Interactions:** Number of times students interacted with digital and face-to-face resources.
- **Attempts Made:** Number of attempts students made in the interactive activities of the learning ecosystem.
- **Time Dedicated:** Time invested by students in the activities of the learning ecosystem.
- **Answers obtained:** Quality and depth of the students' responses, evaluating their progress in the states of knowledge and socio-emotional competencies.



### *Monitoring System*

To continuously monitor student progress, a monitoring system was designed and implemented that recorded participation in the virtual classroom "Journey through the Life Project", available in the *kestcolombia.org* domain. This system made it possible to evaluate the evolution of the mental models and the development of the students' life projects during the intervention. In addition, activities such as workshops, forums and the "First International Congress of Rural Communities: Exploring Paths to Peace" were carried out, which provided a space for collective reflection on peacebuilding and overcoming the effects of the armed conflict.

### *Intervention Activities*

Activities designed for the intervention included:

- Workshops and Forums: Spaces for collective reflection on peacebuilding, as well as for the development of socio-emotional competencies in students.
- Virtual Classroom Interaction "Journey through the Life Project": An online space where students participated in interactive activities. The virtual classroom included a monitoring system that consisted of 28 multiple-choice questions, with five answer options, which made it possible to assess the level of approach of students to the construction of their life project.
- First International Congress of Rural Communities: Exploring Paths to Peace: An event that offered a space for the discussion and presentation of experiences and strategies for peacebuilding, involving students, teachers and local authorities.

### *Data Analysis*

The analysis of the collected data was carried out using R software, generating descriptive statistics and generalized linear models to correlate various variables (Field, 2013). These included the family context, students' expectations, and the influences of the armed conflict on their personal and academic development. Descriptive and inferential statistical analyses performed using R software made it possible to visualize and identify key trends and correlations (Wickham, 2016). In addition, thematic analysis was applied to interpret qualitative data obtained from interviews and focus groups (Guest et al., 2012).

## **Results**

The results of the study are presented at two times that this research considers relevant.

### *Characterization of the Population and the Impact of the Conflict*

*Impact of the Conflict on Life Projects:* The presence of illegal armed groups and the instability generated by the armed conflict have negatively affected the construction of life projects in young people. A direct relationship was observed between family problems (such as stress and emotional difficulties) and decreased academic performance, which has contributed to school dropout. The difficulties in projecting themselves in the long term were more evident in those students who directly experienced the effects of violence

*Student Expectations and Aspirations:* Pradera youth show a strong motivation to study and work, but they also hope to migrate abroad in search of better job opportunities. However, there is a perceived disconnect with traditional activities in the countryside, reflecting their desire to leave their communities to access higher education and find new opportunities. This migration could imply the loss of valuable talents for the development of the rural community.

*Role of Family Relations and Educational Support:* Family relationships play a crucial role in the construction of life projects. Parental support is essential to young people's academic and personal success, but emotional

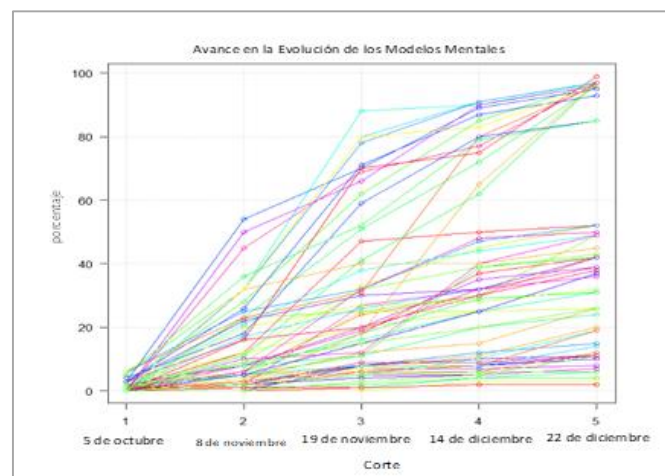
and financial difficulties limit their ability to make informed decisions about their future. Educational intervention in socio-emotional skills is essential to strengthen students' resilience and improve their future prospects.

The results show that, through the hybrid ecosystem, students not only managed to improve their self-esteem and the definition of their goals, but also acquired tools to face the socioeconomic and emotional difficulties derived from their context. However, the need to strengthen socio-emotional support is highlighted to ensure that life projects do not remain mere aspirations, but that they can have a realistic path towards their implementation.

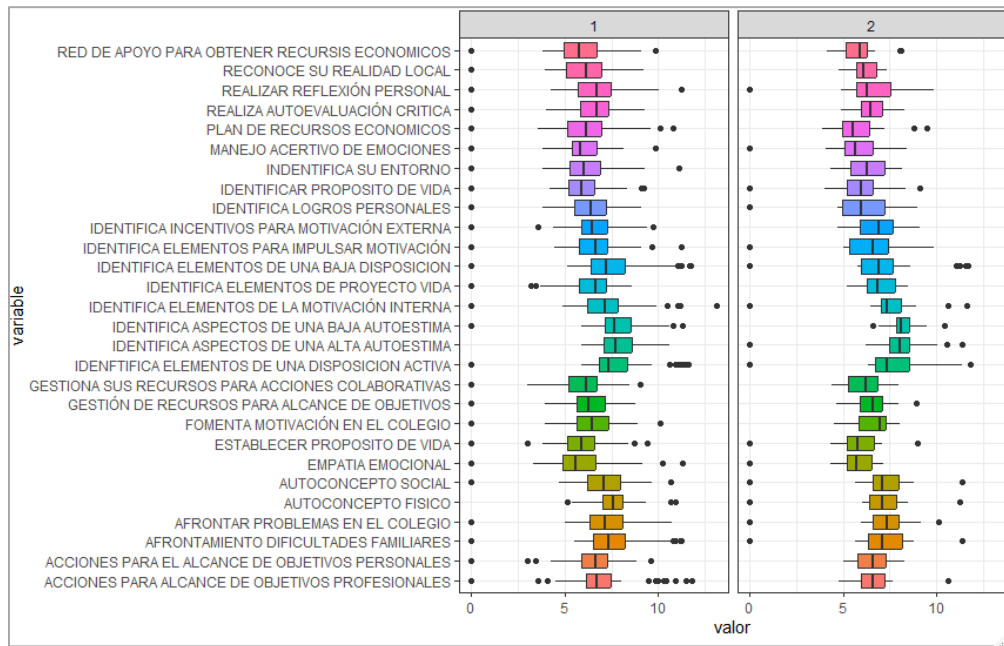
#### *Transformation of Perceptions and Development of Life Projects*

*Transformation of Perceptions of the Armed Conflict:* The educational intervention promoted a transition from polarized and negative visions to a more nuanced and empathetic understanding of the conflict. Students began to identify conflict not only as a series of violent events, but as a complex process that affects both victims and perpetrators, showing a greater willingness to participate in reconciliation processes. This change was evident not only in their way of talking about the conflict, but also in their attitude towards the construction of life projects. Figure 6 shows the curve in the evolution of the mental model of the students who managed to complete more than 24 lessons and answer the twenty-eight (28) questions associated with each state of knowledge, questions that monitor the evolution of the mental model. The curve shows how as they advance in the construction of their life project, the perception of the armed conflict is transformed. Also, there are periods of time with greater activity and others in which the slope of the curve that defines the evolution decreases notoriously. It is possible due to an abandonment of tasks.

**Figure 6.** Transformation Curve of the Perception of the Armed Conflict Vs Life Project. in Original Language Spanish



*Development of Life Projects:* The young people showed significant progress in increasing their self-esteem, defining goals and identifying their strengths and limitations. However, the need to strengthen socio-emotional support in the construction of sustainable projects was also evident. The main challenges related to the sustainability of life projects included areas such as agribusiness, agritourism and entrepreneurship. Young people faced socioeconomic limitations and difficulties in accessing resources and opportunities in rural contexts. Migration to capital cities and other countries was a recurring option for those young people who did not see sustainable local opportunities, highlighting the importance of creating community support networks. The results show that students' interactions with the educational ecosystem generated a significant evolution in their mental models. Through the 28 questions distributed in the knowledge states, a positive change was observed in the way students understood and processed concepts related to armed conflict, peace, and social justice.

**Figure 7.** Variables In Skills for A Life Project. in Original Language Spanish

The average assessment of the responses indicated that 71.8% of the students reached the Inclusive level, which suggests that a high percentage of the students achieved a deep integration of the proposed concepts. Figure 7 describes the variables implicit in the life project and its evolution. This evolution in mental models not only reflects a better academic understanding, but also a change in the perception of armed conflict and its impact on their lives and environment.

*Impact of Hybrid Learning Ecosystems:* The results of this study indicate that the implementation of hybrid learning ecosystems had a positive impact on students' perception of the armed conflict and on the development of their life projects. Key findings include:

- Improvements in Social-Emotional Competencies: Students showed significant improvements in competencies such as resilience, empathy, and emotional management.
- Strengthening of the Social Fabric: Greater social cohesion and community participation were observed among the study participants.
- Transformation of Perceptions: Negative perceptions about the armed conflict decreased, and students began to see the conflict as an opportunity to learn and grow.
- Development of Life Projects: Young people developed clearer and more realistic life projects, based on their strengths and limitations, and were able to set long-term goals.

These results demonstrate the potential of hybrid learning ecosystems to promote resilience and peacebuilding in rural post-conflict contexts. The creation of community support networks and the strengthening of socio-emotional accompaniment are key elements to ensure the sustainability of life projects and the integral development of young people.

**Table 2.** Linear Regression Model. in Original Language Spanish

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REGRESION
lm(formula = RESPUESTAS ~ INTERACCIONES:GENERO + PREGUNTAS: GENERO +
Tiempo + Intentos)
Residuales:
      Min       1Q   Median       3Q      Max
-4.3501 -0.6137  0.1751  0.4460  8.1659

Coefficients:
              Estimate Std. Error   t value Pr(>|t|)
(Intercept)   -1.375e-01  8.905e-02  -1.544   0.123
Tiempo         -1.560e-04  3.677e-05  -4.244  2.60e-05
Intentos       -3.575e-02  2.234e-02  -1.600   0.110
INTERACCIONES:GENERO(Femenino) -3.072e-01  6.422e-02  -4.784  2.24e-06
INTERACCIONES:GENERO(Masculino) -3.079e-01  2.822e-02 -10.913 < 2e-16
PREGUNTAS:GENERO(Femenino)      1.038e+00  7.080e-02  14.666 < 2e-16
PREGUNTAS:GENERO(Masculino)     1.035e+00  3.305e-02  31.318 < 2e-16

Residual standard error: 1.254 on 521 degrees of freedom
Multiple R-squared:  0.9708, Adjusted R-squared:  0.9704
F-statistic: 2882 on 6 and 521 DF,  p-value: < 2.2e-16

```

Finally, a regression model is established in order to estimate the effect of the dependent variable in relation to answers obtained (the times I try to answer the question) in relation to the independent variables, time spent, interactions (the number of times the student entered the ecosystem) and the percentage (refers to the assessment). The regression model is associated with Pearson's coefficient (R) to simultaneously correlate two variables and provides the possibility of predicting the behavior of a variable, in this case the dependent one, in relation to the values taken by the independent variables. Table 2 presents the multiple linear regression model in which the Pearson coefficient R<sup>2</sup> is 0.9708 and adjusted R<sup>2</sup> is equal to 0.9704, which indicates that the model has a high degree of replicability of the results. At the same time, in the same table it is observed that the P value is less than 5% (< 2.2e-16), which indicates that the model is significant calculated with 6 degrees of freedom (variable -1) vs 521 degrees of freedom (individual -variable -1).

In the model, the estimated coefficient for each of the variables ( $\beta_i$ ) is observed, being this value taken in the equation of the regression model, it is observed that the negative values are inversely proportional to the growth of  $\hat{y}$  and the estimated values (Estimate) with a positive sign are directly proportional. It is observed that only in the relationship with questions (number of times I answer) and generate this the positive value, that is, directly proportional. The standard error column indicates the variation of the estimator according to the calculated mean error, being that the variation in the model is high, especially due to the size of the estimators and their variation above the size of the estimate. The significance of each variable in the model is calculated from a student's t-test, which seeks to know if the variable analyzed is significant within the model, which can be read by means of the calculated test statistic (t-value) or by means of the p-value ( $r(> |t|)$ ) Of the variables analyzed, only the attempts were not significant when evaluated with a significance of 0.05. The significance of each variable in the regression model is calculated from the t-value test to observe whether the variable analyzed is significant within the model.

## Analysis and Discussion of Results

Comparing the results of the studies shows that hybrid learning ecosystems can be an effective tool to transform students' perceptions of armed conflict and strengthen their socio-emotional competencies (Puentedura, 2013; Johnson et al., 2021). These findings have significant theoretical and practical implications, especially in post-conflict rural contexts, where educational opportunities are limited.

The mainstreaming of the results seeks to draw broad conclusions that are applicable to contexts beyond the municipality of Pradera. Previous studies have shown that hybrid ecosystems are effective not only in

urban areas, but also in rural communities affected by conflict, which has led to an improvement in students' resilience and in their ability to develop sustainable life projects (Garrison & Kanuka, 2004; Bates, 2015).

### *Theoretical Implications*

The implementation of hybrid learning ecosystems can be a key strategy to promote resilience and peacebuilding in communities affected by armed conflict (Hockley, 2019). This strategy not only helps students overcome the physical and emotional barriers arising from conflict, but also fosters the social and economic regeneration of rural communities.

### *Practical Implications*

The implementation of hybrid learning ecosystems can be a key strategy to promote resilience and peacebuilding in communities affected by armed conflict (Hockley, 2019). This strategy not only helps students overcome the physical and emotional barriers arising from conflict, but also contributes to the social and economic regeneration of rural communities.

### *General Behaviors Observed and Changes in Mental Models*

The results show that the students' interactions with the implemented hybrid ecosystem generated a significant evolution in their mental models, reflecting transformational learning (Mezirow, 1991). Through the 28 questions distributed in the different states of knowledge, a positive change was observed in the way in which students understood and processed concepts related to the life project, armed conflict, peace and social justice.

**Figure 8.** Results of Application of the Instrument for the Evolution of Life Projects. in Original Language Spanish

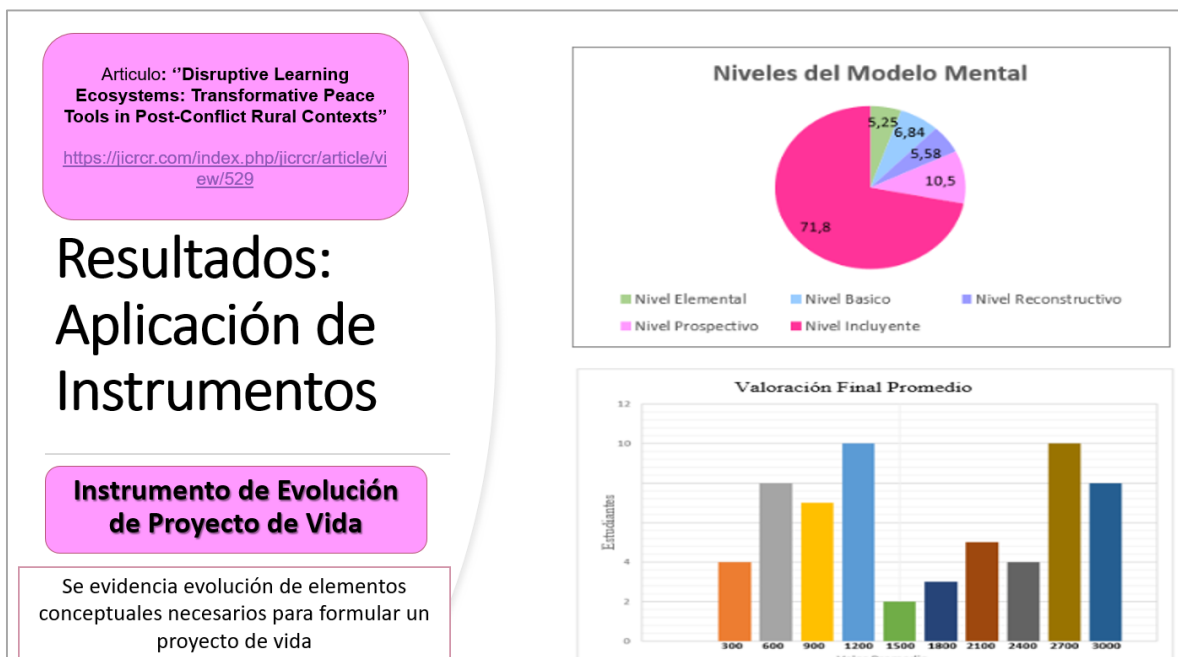


Figure 8 presents the graphs of the levels of the mental model, the inclusive one being the most significant, that is, the students approach the proposed conceptual model.

### *The Life Project and the Change in Perception of the Armed Conflict*

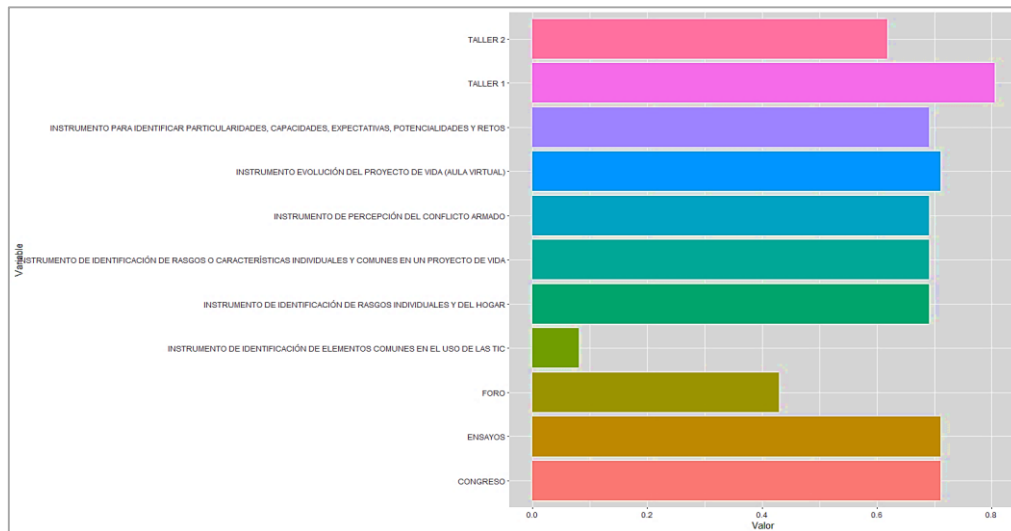
Despite being distanced from conflict in their daily lives, students showed a strong commitment to peace, social justice, and reconciliation, which is consistent with previous studies that point out that educational

environments can be powerful catalysts for reconciliation processes in post-conflict contexts (Leidman et al., 2019).

*Interaction With the Ecosystem and Its Impact on the Construction of the Life Project*

The interactions within the proposed educational ecosystem, both with the devices and with teachers, academics, parents and other students, were key in the development of the mental model and the life project of the students. According to studies on social learning, constant feedback and social interaction are fundamental for the development of socio-emotional skills and the strengthening of identity (Vygotsky, 1978; Bandura, 2001). Figure 9 shows the results of community participation in the hybrid ecosystem.

**Figure 9.** Community Engagement Outcomes. in Original Language Spanish



The students highlighted the importance of the possibility of reviewing content, asking questions and receiving clarifications from teachers in real time. This feedback process allowed them, in many cases, to unlock moments of frustration and move forward with their learning. This supportive environment not only improved their academic understanding, but also contributed to the development of socio-emotional competencies crucial for the construction of their life project, such as resilience and empathy, Figure 10 presents the links to the blogs associated with the hybrid learning ecosystem.

**Figure 10.** Dissemination Blogs. in Original Language Spanish



### *Average Assessment and Levels of the Mental Model*

Based on the 28 multiple-choice questions distributed in the different states of knowledge, as problem situations to be solved, each of the five levels of mental model (elementary, basic, reconstructive, prospective and inclusive) achieved is identified, constituting a valuable strategy for evaluation and configuration of the conceptual model (Benítez, M. & Becerra, F. 2019). The use of technology to obtain the results as soon as the evaluation is presented and immediately obtaining feedback or a motivating message is a great advantage for students, teachers, and parents moving from a summative to a formative approach (Benítez, M. & Becerra, F. 2020). The students presented a significant evolution towards a conceptual model that aligns with their life project. This shift reflects not only the acquisition of knowledge, but also an adjustment of their beliefs and values, especially in relation to their understanding of armed conflict and its role in peacebuilding.

### *Linear Regression Model and Correlation of Variables*

Linear regression analysis showed a high correlation between interactions, time spent, and responses obtained, suggesting that greater participation in the educational ecosystem is associated with better academic performance. This finding is consistent with studies that show that continuous interaction with learning materials and constant feedback can significantly improve educational outcomes (Ericsson et al., 2014).

This analysis reinforces the importance of hybrid learning ecosystems as an enabling environment for the integral development of students, promoting both their academic and personal growth. In addition, a significant decrease in dropout rates was observed, especially in post-conflict and current conflict rural contexts, where students are often unable to attend school due to socioeconomic and security factors. The flexibility of the hybrid ecosystem allowed students to continue their education despite these difficulties, promoting equity and inclusion.

## **Conclusions**

This study highlights the importance of a comprehensive approach to the development of life projects in post-conflict contexts. Despite structural difficulties, rural youth in Pradera have the potential to contribute to the development of their communities if they are given the necessary tools (Garrison & Kanuka, 2004). It is essential that public policies focus on improving local educational and employment opportunities, fostering the development of socio-emotional skills, leadership, and resilience, as suggested by various studies on the impact of education on vulnerable communities (Leidman et al., 2019). Finally, the strengthening of family ties and the creation of community support networks are key elements to ensure that young people can not only develop sustainable life projects, but also be an active part in the reconstruction of their communities (Vygotsky, 1978).

Hybrid learning ecosystems have proven to be powerful tools for transforming perceptions of armed conflict, strengthening young people's socio-emotional competencies, and facilitating the construction of resilient life projects (Puentedura, 2013; Siemens, 2005). However, the need to strengthen socio-emotional support and to create community support networks that contribute to the sustainability of these projects is also highlighted. Migration, seen as a way out for rural youth, underscores the urgency of improving local educational and employment opportunities to retain talent and strengthen the social fabric in post-conflict rural communities (Bates, 2015).

Educational interventions, especially those that combine a socio-emotional approach and the use of ecosystems with a mixed approach, are key tools to transform young people's perceptions of armed conflict and promote peacebuilding in post-conflict contexts (Hockley, 2019). The educational ecosystem implemented in Pradera has contributed to the creation of resilient life projects, allowing young people to reflect on their future and visualize a more hopeful and constructive path (Serrano, 2011).

The integration of the various components of the learning ecosystem (digital technologies, teacher-student interaction, feedback, and experiential activities) has been a fundamental factor in the evolution of students (Ericsson et al., 2014). This environment has facilitated the development of a more critical perception of the armed conflict and has encouraged students to reconfigure their life project in a resilient way committed to peace. The use of technologies and feedback within the educational ecosystem not only improve the acquisition of knowledge, but also strengthen key socio-emotional competencies for the construction of a culture of peace (Garrison & Kanuka, 2004).

The educational ecosystem has also served as a space for personal and collective reconciliation, helping students process traumatic experiences of conflict and construct alternative narratives based on resilience and hope (Mezirow, 1991). These transformation processes contribute to the strengthening of peace and social justice in rural communities affected by the armed conflict (Leidman et al., 2019).

The results obtained offer valuable lessons for the design of public policies and educational programs aimed at reconciliation, social transformation, youth and community development, and peacebuilding (Siemens, 2005). Based on these learnings, it will seek to transfer the mixed ecosystem model to other educational institutions and rural communities, promoting the dissemination of the results through scientific publications, congresses and informative material for the community.

This research highlights the importance of hybrid learning ecosystems as effective tools to promote resilience, autonomous learning, and emotional development of students in rural and post-conflict contexts (Bates, 2015). Through interaction with the educational ecosystem, students not only improved their understanding of academic content, but also transformed their perception of the armed conflict, evolving towards a more critical and committed vision of peacebuilding (Bautista Díaz et al., 2019).

The educational ecosystem, by integrating digital and face-to-face experiences, was configured as a space for reflection and learning, where students were able to reconfigure their beliefs and values, not only regarding the history of the armed conflict, but also about their future and the role they wish to play in the construction of a more just and peaceful social environment (Benítez et al., 2024a).

The study presents a focus on mainstreaming results by integrating various dimensions of the educational process: the transformation of perceptions about the armed conflict, the development of socio-emotional competencies and the construction of resilient life projects. The results show that the use of hybrid learning ecosystems has achieved a significant change in Pradera students, strengthening their capacity to face the challenges of the post-conflict (Bandura, 2001). This research not only provides key data on the impact on a specific community, but also offers cross-cutting lessons for designing public policies and educational strategies that foster peace and reconciliation in rural and post-conflict contexts throughout Colombia and other regions affected by armed conflict (Jenkins, 2021).

## Contributions and Recommendations

The results of this study underscore the need to design educational ecosystems that not only favor conceptual learning, but also promote the development of emotional and social competencies. In this sense, digital ecosystems and feedback tools are essential for the transformation of students' mental models and their ability to make informed and resilient decisions in the face of the challenges of their environment. This ecosystem approach can contribute significantly to peacebuilding in rural communities affected by armed conflict, by providing students with the resources and support necessary to overcome adversity and reconfigure their life project with a more hopeful perspective and commitment to social justice.

### Contributions

- *Transforming Perceptions of Armed Conflict:* This study shows that hybrid learning ecosystems can significantly transform students' perceptions of armed conflict, helping them develop a more empathetic and nuanced understanding. These changes in perception are crucial for building a culture of peace and reconciliation in post-conflict contexts.



- *Development of Social-Emotional Competencies:* The hybrid educational ecosystem has proven to be effective in strengthening students' social-emotional competencies, such as resilience, empathy, and self-regulation. These skills are essential for personal and social development, as well as for the construction of sustainable life projects.
- *Reduced School Dropout:* The flexibility of the hybrid ecosystem has allowed students to continue their education despite socioeconomic and security difficulties in post-conflict rural contexts. This has contributed to the reduction of school dropout rates and the promotion of equity and educational inclusion.
- *Building Resilient Life Projects:* The results of the study show that interaction with the educational ecosystem has allowed students to reflect on their future and build resilient life projects committed to peace. This holistic approach facilitates the development of a more critical and constructive view of the role of young people in their communities.

The study reveals the need to continue carrying out this type of intervention and suggests the following recommendations.

### Recommendations

- *Train teachers in socio-emotional competencies:* To address the emotional and psychological challenges arising from the armed conflict and help young people manage their emotions.
- *Creating community support networks:* Encouraging the creation and strengthening of community support networks is key to ensuring the sustainability of young people's life projects. These networks can include teachers, families, local authorities and community organizations, working together to support the integral development of students, strengthen local employability and foster social inclusion, reducing migration to large cities and other countries.
- *Expand the mixed and hybrid ecosystem model:* Based on the positive results observed in Pradera, the expansion of the hybrid ecosystem model to other educational institutions and rural communities is recommended. The transfer of this approach can facilitate educational and social transformation in other regions affected by armed conflict and rural communities through the creation of a methodological guide and the conduct of training workshops for teachers and members of the educational community.
- *Strengthening socio-emotional competencies in young people:* It is essential to reinforce the socio-emotional support of students through programs and policies that promote emotional well-being and resilience. This includes training teachers and facilitators in socio-emotional competencies and conflict management, and offering programs that address emotions, resilience, and leadership.
- *Developing public policies that support youth entrepreneurship:* Education policies should focus on promoting equity and inclusion, ensuring that all students, especially those in rural and post-conflict contexts, have access to quality education. This includes the provision of adequate resources and the removal of socio-economic and geographical barriers in rural areas affected by the current conflict and the generation of employment in the rural context.
- *Promotion of youth participation in the development of their communities:* Create spaces for active participation where young people can be part of the decisions that affect their environment and thus retain talent and strengthen the social fabric in post-conflict rural communities. It is crucial to improve local educational and employment opportunities by developing technical and vocational training programmes that respond to the needs of the labour market and promote entrepreneurship and innovation.

- Improve vocational guidance for young people: With an emphasis on the diversity of professional opportunities, both locally and internationally.
- Dissemination of Results and Good Practices: Promote the dissemination of the results of the study and the good practices identified through scientific publications, congresses and informative material for the community. This will allow for the sharing of experiences and lessons learned, contributing to the design of more effective public policies and educational programs.

## Recognitions

The mainstreaming of the results of this research are part of the project: "Changes in perception of the armed conflict of students in the rural area of Pradera, Valle del Cauca from the evolution of their life projects", prepared within the framework of the Orchids Women for Science Peace Agents Program of the Ministry of Science, Technology and Innovation, call 935, Contract 112721-277-2023 with the San Buenaventura University-Cali Campus. The researcher, the young researcher and the support staff thank the educational communities (students, parents, teachers, teaching directors, administrative staff, general services personnel and inhabitants of the townships of Lomitas and El Retiro) of the Mercedes Abrego and Antonio Nariño educational institutions for their support, willingness and contributions to this project. Likewise, we thank the Mayor of the Municipality of Pradera and the Secretary of Education for the openness and willingness during its execution and all the academic staff and researchers who contributed with their presentations and conferences in the First Congress of Rural Communities: Exploring Paths to Peace. Our total gratitude.

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