

# Digging and building: How transformative mixed-methods research contributes to explaining and responding to educational exclusion and school dropout

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## ARTICLE INFO

### Keywords:

Mixed-methods research  
Educational exclusion  
School dropout  
Educational psychology  
Transformative methods

## ABSTRACT

Transformative mixed-methods research (T-MMR) provides an integrated understanding of social issues while simultaneously working toward their transformation. This paper illustrates how this approach deals with urgent problems affecting vulnerable groups that experience socioeducational inequality, focusing on educational exclusion and school dropout in youth and adult education in Chile. Using the metaphor of digging and building, this study explores how T-MMR facilitates a comprehensive approach by integrating qualitative and quantitative methods to understand and respond to these issues from an educational psychology perspective. Findings show that through digging (QUAN-QUAL), educational exclusion is rooted in systemic inequalities, with marginalized students facing persistent barriers that the education system fails to adequately address. However, the strength of T-MMR lies in not only revealing these challenges but also co-creating practical solutions. That is what we call building. To deepen our understanding of school dropout, this phase consisted of an integration of quantitative and qualitative data and collaborative work with students, teachers, and policymakers, creating a particular and precise response. Finally, this research highlights the value of T-MMR for engaging communities in both understanding (digging) and reshaping (building) educational practices, offering a transformative pathway toward a more just and responsive education system.

## 1. Introduction

### 1.1. Building and digging: mixed-methods research as a paradigm for greater depth and social transformation

Like the other two major research methodologies, quantitative and qualitative, mixed-methods research (MMR) is rooted in the paradigm guiding each project's methodological design, not only the techniques it uses (Creswell and Plano Clark, 2018; Fetters and Molina-Azorin, 2019; Greene, 2007). Quantitative methodology traditionally aligns with the positive approach, treating the study object as a measurable phenomenon that can be observed through tools like questionnaires and surveys (Babbie, 2020; Kent, 2001; Reyes-Jarquín et al., 2021; Talak, 2009). Therefore, the primary aim is to generalize findings from a sample to a broader population. This focus on precision and measurement has made validity and reliability central concerns, leading to numerous studies on scaling and questionnaire design (DeVellis, 2017; Furr and Bacharach,

2014). This approach could be termed *extensive methodology*.

In contrast, qualitative methodology is associated with deep knowledge and a thorough understanding of a phenomenon, considering its social, historical, cultural, territorial, or political context. Here, the study object is seen as a social construction shaped by the practices, experiences, and meaning of the people involved (Berger and Luckmann, 1966; Denzin, 1989). The goal is not to generalize, but to grasp the unique features of each phenomenon in its specific context. Thus, trustworthiness and validity are replaced by the quality and detail of the datum in its context, social utility, or capacity for local transformation (Denzin and Lincoln, 2018; Lincoln and Guba, 1985; Patton, 2015). This is what we refer to as an *intensive* type of methodology.

MMR faces the challenge of combining the extensiveness (scope) and intensity (breadth) underlying quantitative and qualitative methodologies, a strategy that attempts to integrate approaches and thus, compensate for their weaknesses (Fusch et al., 2018; Greene, 2007). Reactions to this challenge vary, from those declaring the impossibility

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<https://doi.org/10.1016/j.metip.2024.100170>

Received 1 August 2024; Received in revised form 29 November 2024; Accepted 2 December 2024

Available online 4 December 2024

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of a dialogue between paradigms, given that this hybrid nature would lack qualitative depth and quantitative rigor (Denzin and Lincoln, 2018; Guba and Lincoln, 1989; Guba and Lincoln, 1989; Hammersley, 1992), to others indicating the difficulty of integration, which would compromise the integrity of each approach (Fielding, 2012; Morse, 1991), to a retrospective classification based on the predominant procedures used in the research design—each with intermediary conciliatory options—due to the possibility for triangulation and combination (Flick, 2004; Morgan, 2014; Tashakkori and Teddlie, 2010). This spectrum reflects the detractors and supporters of MMR, trying to respond to each criticism of its philosophical assumptions and practical approach, procedure, and scope.

However, a transversal agreement among proponents of MMR refers to its contribution to a broader and deeper understanding of phenomena by integrating strategies of data gathering and its practical implementation in theoretical frameworks and results, compared to purely quantitative or qualitative methods (Bazeley, 2018; McKim, 2017). MMR fosters a dialectic stance between paradigms, creating a balanced, comprehensive epistemological approach (Greene, 2007), enhancing findings and strengthening interest in this discipline (Creamer and Reeping, 2020; Fetters & Molina-Azorin, 2017).

MMR is characterized by a complex, deep, and detailed understanding of the study object as fundamental to its axiomatic paradigm. Thus, attention is paid to how the political, historical, and cultural aspects of the participants making up the investigation from their everyday practices are linked at different levels or scales of the universe, especially in social sciences (Fàbregues et al., 2021; Mertens, 2008, 2015, 2019). Consequently, MMR can be defined as a systematic approach that integrates quantitative and qualitative data sources and analytic procedures to gain a fuller understanding of complex social phenomena (Creamer and Reeping, 2020; Mertens et al., 2016; Tashakkori and Teddlie, 2015).

For all these reasons, we summarize the first goal of MMR using the metaphor of *excavation*. To explore a phenomenon in depth, we must delve *intensively* into its different aspects and details, but in the process of digging down, we also need a sufficiently *extensive* space to give the studied phenomenon robustness and rigor, ensuring it does not become an irrelevant anecdotal phenomenon (which would mean losing its qualitative utility and quantitative validity). In other words, the first goal of MMR is going deeper through an intensive and extensive digging into the phenomenon under study, thus dealing with the fear of reducing the complexity of each method, given each is performed holistically and rigorously.

In this article, we argue that MMR that is grounded in the transformative paradigm (Mertens, 2008, 2021) has at least one more goal: *building* for transformation (Mertens, 2007; Sweetman et al., 2016). Transformation alludes to not only the description and understanding of a phenomenon but also how the breadth and scope of understanding allow researchers to build solid blocks of knowledge that facilitate short-, medium-, and long-term transformations of social inequities. Transformative MMR (T-MMR) cannot, in this process of excavation, be separated from a commitment to change, considering the emergence of new elements and possibilities that would be hard to address from a purely quantitative or qualitative viewpoint. Hence, in this paradigm, digging and building are two sides of the same coin, and when we refer to one, we directly interrogate the other.

In the socioeducational context, this perspective has been positively valued and considered for its emphasis on social justice, addressing the inequities and inequalities of a model that in many countries needs transformation and improvement for segregated and marginalized collectives (Greene, 2015; Mazzei and Cuc, 2021; Mertens, 2020; Ott Walter, 2020). In the process of digging, we can recognize dynamics of power and political, structural, and educational oppression of groups that have been historically and culturally underserved (Biddle and Schafft, 2015; Mertens, 2015; Shannon-Baker, 2016).

Returning to the metaphor of excavation, transformation can be

understood as part of the action of building. After all, a solid construction is not possible without appropriate preliminary excavation to explore the territory and its characteristics, conditions, and possibilities. Therefore, social transformation cannot occur without a previous, in-depth exploration of the phenomenon. Only then does the phenomena that we are researching acquire meaning and become relevant and sustainable over time.

This is where T-MMR again offers a contribution that quantitative and qualitative methodologies often overlook or cannot achieve. Through the use of MMR tools and techniques, the epistemological, ethical, and political stances of T-MMR allow a way of understanding the investigated phenomenon that is inherently both more extensive and intensive. In this sense, T-MMR seems to respond profoundly to the impact and improvement of society through its social meaning (Sordé Martí et al., 2020, p. 949). This is due to the broader and more nuanced understanding of social problems it provides, giving a more complete and accurate picture of social reality, thus enabling more informed and effective decisions based on a deep and multifaceted comprehension of social problems and needs.

The constructive commitment of T-MMR is characterized by a fundamental ethical assumption in methodological design that contributes to social justice (Mertens, 2020). This is understood as an active process of identifying and addressing inequities in social, economic, and environmental domains, with the goal of challenging and transforming oppressive structures that perpetuate marginalization (Mertens, 2007; 2021). Here, the second characteristic of the axiomatic paradigm of MMR is a transformational viewpoint and ethic that permeates the research process. This enables us to not only explore the studied social phenomenon more comprehensively and deeply, but also gather evidence about the effects of research in terms of its implications for participants, broader social impact, and potential to either reproduce or disrupt patterns of exclusion and marginalization (Mertens, 2019).

In the context of MMR grounded in the transformative paradigm, there is an inseparable double goal: a deep and broad understanding of the phenomenon, along with a commitment to the transformation of injustice or exclusion. Our aim in this study is to demonstrate how the metaphors of digging and building align and help specify the transformative ontological and methodological paradigm that underlies T-MMR. To do this, we specify how T-MMR can provide the solid and transformative knowledge-building processes needed to challenge educational exclusion and dropout. The phenomenon of interest is complex, socially situated and culturally embedded on educational, psychological and social problem, that need a vision to considered nontraditional contexts, diverse people and levels, and methodological eclecticism (Bobbit, 2020; McCrudden and Marchand, 2020).

Although our research context is Chile and its unique pathways for educational exclusion, the problem of educational exclusion, particularly students dropping out or being pushed out of regular mainstream schooling, is a global problem of many countries and regions throughout the world (Angrist et al., 2021; Lichand et al., 2021). It is one of the main concerns of international organisms such as UNESCO (2020), UNICEF (2021) and the World Bank (Azevedo et al., 2021). Our specific research problem is the transition that occurs when students opt or are pushed out of regular schools and enter other forms of formal education such as youth and adult education (YAE), an increasing phenomenon worldwide (Angrist et al., 2021; Center for Global Development, 2021).

## 1.2. Digging into the problem: T-MMR in educational exclusion and dropout

### 1.2.1. School dropout: A pending policy, an unresolved practice

Inequality, exclusion, and dropout have become central issues in discussions of educational systems worldwide (UNESCO, 2020), particularly affecting the most vulnerable groups, such as students in the Global South, who have few resources and little support. Intersectionality further highlights how these factors exacerbate inequality and

discrimination (Delamont and Atkinson, 2017; Nieto, 2018; Noguera, 2018; Reay, 2018). Dropout affects the identities, subjectivities, future prospects, and societal ties of these individuals, with risk factors emerging at multiple levels: macro (policies and resources), meso (community and territorial links), and micro (student behaviors, conduct, and performance; Hirakawa and Taniguchi, 2021; Rodríguez et al., 2023). Individual characteristics, such as gender, migration status, race, mental health, and family background—including socioeconomic status, social capital, and intergenerational educational levels—also play a crucial role (Díaz and Osuna, 2020; Paniagua, 2022; Suárez and Alvarado, 2022).

Although school dropout is commonly framed as an educational issue, it is deeply relevant to the field of psychology, particularly educational psychology, due to its impact on students' cognitive, emotional, and social development. The process of disengagement from the education system is intertwined with key psychological factors such as motivation, self-regulation, mental health, and identity formation (Johnson, 2019; Noddings, 2018). School disengagement that leads to dropout affects not only students' educational trajectories but also and consequently, their future life and work trajectories (Calvo, 2021). Hence, understanding and addressing the emotional and cognitive dimensions of exclusion and dropout is crucial to creating inclusive educational environments that promote resilience, well-being, and lifelong learning (Vesely et al., 2024).

Educational exclusion and dropout are gradually increasing worldwide, weakening the student-school learning link and causing some individuals to leave the education system (Valenzuela et al., 2019; Zancajo and Bueno, 2023). In this context, YAE emerges as a particularly vulnerable area. Exclusion and dropout in YAE occur in a complex gray zone, because this modality primarily serves individuals returning to education under suboptimal conditions (UNESCO, 2019), given YAE institutions are often underfinanced and undersupported by the administrators of educational systems (López et al., 2023). The insufficient support for YAE institutions perpetuates cycles of exclusion, because these students remain overlooked by broader educational reforms (Fraser, 2012; Letelier, 2019). This highlights the need for a multidimensional and socioecological understanding of dropout that considers micro-to macro-level factors (Bronfenbrenner, 1991).

Although various authors have recognized the need to tackle, identify, and develop solutions for educational journeys that take unexpected directions, situated from a cultural and inclusive perspective (Klingner and Boardman, 2011), school dropout is still a problem mostly invisible at the macro-political and micro level for different reasons. From a managerial perspective, it offers a low return on investment (Orfield, 2017), and from a biopolitical view, it recognizes that cheap working-class labor is always needed, removing the incentive to deal sensibly with dropout (Noble, 2018). Thus, both those subjected to and attempting to generate a response from their precarious conditions and scant resources have been historically and systematically negated (Giroux, 2019; Kelchen, 2020). This research problem calls for a social justice, transformation-oriented design, because it seeks to not only dig into the causes of dropout but also build strategies that disrupt cycles of exclusion and foster inclusion (Mertens, 2020).

### 1.2.2. Political and cultural challenges in Chilean educational exclusion

Chile's education system has been deeply shaped by its political and economic history, particularly the neoliberal reforms implemented during the military dictatorship in the 1980s. These reforms prioritized privatization, market-driven policies, and new public management principles, positioning education as a commodity and fostering competition among schools and students. The long-standing influence of these policies persists, with a focus on accountability, standardized testing, and performance-based funding continuing to dominate the educational discourse. As a result, the education system has struggled to address inequality, particularly among marginalized youth and adults, many of whom face systemic barriers that increase their risk of dropping out.

YAE, a key modality in tackling school dropout, remains severely underfunded and excluded from quality-enhancing reforms such as subsidies and performance-based programs, further entrenching educational exclusion (Contreras-Villalobos et al., 2022; López et al., 2022).

In this context, the challenges faced by YAE are not solely educational but deeply intertwined with Chile's broader political and cultural landscape. The neoliberal model has not only shaped policies but also contributed to a cultural narrative that frames educational success through individual responsibility and competition, marginalizing those who do not fit the standardized trajectory of success. This creates significant obstacles for YAE students, many of whom come from vulnerable and socioeconomically disadvantaged backgrounds. The lack of tailored interventions, flexible curricula, and comprehensive support further perpetuates educational inequity, making it necessary to reassess the political commitment to inclusive education. Without systemic changes that address these structural issues, the cycle of exclusion and dropout in Chile is likely to persist (Sisto et al., 2021).

### 1.2.3. Digging in quantitative and qualitative approaches: Measuring and understanding school dropout

A review of the literature on educational dropout in Scopus and Web of Science between 2018 and 2023 using the keywords "school dropout" and "psychology" or "education" showed that a significant number of scientific publications exist ( $N = 182$  in Scopus and  $N = 160$  in Web of Science). However, in this context, research has tended to adopt either a purely quantitative or qualitative methodological stance, often missing opportunities to integrate both approaches in a more comprehensive analysis.

Quantitative studies on school dropout have focused on statistical and numerical data to identify patterns and predictors of dropout. These studies typically focused on measuring the magnitude of school dropout using indicators such as dropout rates, academic underachievement, and repetition rates (Rodríguez et al., 2023; Saracostti et al., 2021). Recent studies employed advanced statistical models and machine learning algorithms to predict the risk of school dropout based on various factors, such as academic performance, socioeconomic status, behavioral issues, and physical and mental health (Ferreira et al., 2022; Jung et al., 2019; Mduma et al., 2019). Among the findings of these studies, statistical models highlighted that students who show early signs of academic disengagement and those from marginalized backgrounds are at higher risk of dropping out (Calvo, 2021; Dennison, 2020).

However, this focus on measurable outcomes can sometimes reduce the issue to mere numbers, providing a simplistic view that overlooks the nuanced experiences of individuals facing school dropout. Although valuable for identifying trends and predictors, this perspective often fails to capture the emotional and social dimensions of students' journeys or trajectories (McCrudden et al., 2019; Neut and Miño, 2018). The over-reliance on quantitative measures also tends to reinforce a dichotomy or binarism between "winners" and "losers" in the educational process, without considering the systemic and structural inequalities that drive school dropout (Román and Murillo, 2008).

In contrast, qualitative research seeks to explore the lived experiences of students and frames dropout as a narrative, biographical, and emotional process that unfolds over time (Richards, 2017). This approach highlights how dropout is often a gradual process of disengagement from the education system, frequently marked by feelings of alienation, exclusion, and a lack of institutional support (Tarabini and Jacovkis, 2024). School dropout is perceived as an experience that affects students' social and emotional well-being, affecting their personal identities and future opportunities (Amitay and Rahav, 2018; Lardier et al., 2020). The failure of education systems to provide adequate psychosocial support, especially for students facing poverty, discrimination, and family instability, exacerbates these challenges (Richards, 2017). Moreover, many students who drop out face serious personal and academic challenges, including mental health issues like depression and

anxiety (Mikkonen et al., 2018). School-related factors, such as poor academic performance, financial and psychological well-being, absenteeism, and weak relationships with the school community, also play a critical role (Dennison, 2020; Vesely et al., 2024). Nevertheless, qualitative research alone can sometimes fall short in providing a broad understanding of dropout as a systemic issue, because it often emphasizes individual experiences without connecting these narratives to larger social, political, and economic contexts.

In our literature review, we found that fewer articles explicitly declared a mixed-methods approach ( $n = 170$ ), and those referring to topics concerning psychology and education numbered only 23. None of these studies addressed samples of students who had already transitioned from regular (mainstream) education to YAE schools, a crucial gap in the literature given the rising number of such transitions worldwide. From the available research, it is evident that learning difficulties, school demotivation, and health problems (McDermott et al., 2019) are key predictors of dropout. Additionally, research has highlighted that comprehensive interventions addressing both structural and individual factors are more effective in preventing dropout (Balenzano et al., 2018), as are those focused on enhancing educational self-efficacy through teacher support and guidance (Cavaco et al., 2020; Hungnes et al., 2022).

As a noteworthy finding, none of these works explicitly emphasized the transformative component of mixed methods, despite the potential of T-MMR to address dropout through a social justice lens. However, it can be recognized the work of Amoroso et al. (2021) and Hungnes et al. (2022) featured interest in incorporating marginalized voices, such as those of marginalized students who are in the process of disengaging from school, through interventions aimed at preventing school dropout. Additionally, there has been a critical examination of power structures in relation to marginalized populations, which affect student groups in terms of gender equity or poverty, framed in theoretical perspectives linked to social justice (Cavaco et al., 2020; Mayadunne and Kariyasekera, 2021).

Faced with this scenario, the different collectives and educational agents involved at the micro or local level (teachers, managerial staff, educational technicians, and students) have sought different strategies and actions to resolve the issue. These include providing individualized support and establishing personal connections with each student (Johnson, 2019; Noddings, 2018); vocational work in the precarious educational structure (Gitterman, 2019; Lerman, 2020); or initiating spontaneous dynamics to combat dropout through creativity and the local reappropriation of those broader policies (Alinsky, 2020; Freire, 1970).

Therefore, in this study, we posed the following methodological research question: How does T-MMR contribute to understanding dropout? What is its specific contribution to the transformation and improvement of dropout?

In this research context, we positioned ourselves as transformative researchers, given that we considered the transformation of educational exclusion to be a necessity. We assumed that transformative research can both recognize and repair the threatened right to education of children, young people, and adults, making visible the responses and actions arising from contexts in which inequality is prevalent. Given our research purposes, we adopted a T-MMR stance to address educational exclusion, school dropout, and transitions into nonregular schooling as a research problem. At the same time, we provided information and resources for participants acting as collectives groups or social movements, facilitating and enhancing their agency so they can move forward, not only in digging, but also in building new contexts.

Thus, because MMR requires an intensive and extensive understanding of the phenomenon, through a perspective of transformation and justice (Mertens, 2020), this research explored T-MMR as a tool for dealing with socioeducational exclusion and dropout. Through digging and building, we describe how a general framework has been established to transform and respond to this socioeducational problem.

## 2. T-MMR and its role in the political understanding and practical transformation of school dropout and educational transitions

### 2.1. A T-MMR design

Using a transformational approach, T-MMR (Mertens and Wilson, 2019) can be used to support inclusiveness by being responsive to participants' and collectives' cultural and identity elements in the study strategy, design, and planning process. The research on which this paper is based used a T-MMR design (Creswell and Plano Clark, 2023; Mertens, 2023a). Adopting a systemic and participatory design, the study explored these educational phenomena holistically, integrating the voices of YAE students, teachers, and policymakers. Specifically, a case study (Merriam, 2009) aimed at gaining a deep understanding of school dropout in YAE in Chile. Simultaneously, it sought to advocate systemic change through policy recommendations. The case study examined the uniqueness, intensity, processes, and complexity of school dropout and educational transitions (Merriam, 1998).

This design facilitated a multimethod exploration, gathering information from various data sources to understand and interpret the problem comprehensively in three phases. This integration of both quantitative and qualitative data allowed for a more nuanced view of educational exclusion, while also highlighting specific intervention points for transformation. Considering this, multilevel issues at the stages of study development, which includes theoretical specification, sampling, data collection, data analyses and integration (Headley and Plano Clark, 2020). The combination of digging into the causes of dropout and building solutions with the YAE community further enhanced the study's transformative potential (see Table 1).

The design also incorporated a socioecological approach (Bronfenbrenner, 1991) through an analysis of the system at three levels: students, school, and policy. Here, it was important to identify critical points, allowing an enriching, collective participatory learning for both the school communities dealing with dropout and us as researchers. It also facilitated an understanding of the diverse experiences and needs across YAE contexts, capturing variations in educational practices and responses to dropout. This systemic approach enhanced the study's ability to generate insights for practical transformation. In that way, the research involved phases with iterative feedback as they progressed (Creswell and Plano Clark, 2018), which guided their development. Inspired by multiphase T-MMR (Mertens, 2023b), we considered.

- 1) Contextual analysis: We examined international, national, and regional reports, laws, and local regulations defining and regulating YAE and created databases to analyze the factors influencing dropout.
- 2) Building relationships: We engaged with YAE communities—students, teachers, and policymakers—to understand dropout experiences and current exclusion educational practices, along with potential answers to these problems.
- 3) Reviewing and sharing analysis: We gathered feedback from the YAE community to shape the research, ensuring it was grounded in real experiences and informed practical recommendations.
- 4) Using results for transformation: We shared findings with policymakers, community stakeholders, experts, and nonexperts to create actionable guidelines promoting social justice through recognition, redistribution, and participation.

## 3. Results

This section presents the results of the study, structured according to the three key phases of the T-MMR framework: 1) macro-level contextual analysis, 2) digging and building phases, and 3) using results for transformation. Each phase integrates both quantitative and qualitative

**Table 1**  
Methodological Phases and Data Sources by T-MMR design.

Methodological Phase	Quantitative Data Sources	Qualitative Data Sources	Sample and participants	Integration
Macro-level: Contextual analysis	National and regional reports, datasets on YAE dropout rates, and statistical analysis of demographic data (age, gender, ethnicity)	Document analysis of local regulations and policies and laws in YAE	Quan: 10,130 students Qual: 41 documents	Identification of key demographic, academic, and policy-related dropout factors
Digging and building	Digging: Predictive modeling of dropout risk using multilevel analysis	Digging: Interviews and focus groups with YAE students, teachers, and policymakers	Quan: 10,130 students Qual: 40 students, 18 teachers, eight school principals	Building: Participatory cross-examination of dropout risks and subjective experiences of YAE communities
Using results for transformation	Risk and protective factors of dropout to generate answers and responses (e.g., age, attendance, school size, rate)	Collaborative sessions with YAE community members to analyze ways of transforming dropout and exclusion	Three participatory analysis tables and one virtual conference, with four students, eight teachers, four school principals, two policymakers, and two experts	Co-construction of policy recommendations based on empirical and lived data, using empowerment approaches and techniques

data, providing a comprehensive and transformative understanding of school dropout in YAE.

### 3.1. Macro-level contextual analyses: understanding the foundation of educational dropout

The macro-level phase of analysis provided a comprehensive overview of broader structural and contextual factors contributing to dropout patterns within Youth and Adult Education. Specifically, the quantitative phase of digging at this level into the problem characterized both, the exclusionary practices and population most affected by them. We identified variables influencing dropping out of school and those that could make it easier to stay in school. In the educational inclusion quantitative literature, this is commonly known as describing and analyzing barriers and facilitators. Thus, we obtained an extensive image of dropout for the specific context of this research. Results enabled us to characterize the population that experienced dropout and entered YAE, recognizing characteristics such as gender, age, and academic performance. Quantitative data from national and regional reports revealed demographic patterns, identifying at-risk populations. Key factors such as low institutional support, inadequate resources, and systemic barriers were highlighted, demonstrating the need for systemic changes to address educational exclusion (Contreras-Villalobos and Baleriola, 2022).

Qualitative document analysis further explored the regulatory and policy landscape. Among findings from the documentary analysis of the YAE context, we learned that regulations prioritized a logic of recognizing academic qualifications for quick access to the labor market (Contreras-Villalobos et al., 2022). In this logic, there gradually emerges a concern for a process of meaningful teaching, leading the certification and training functions to coexist in a fragile equilibrium and permanent tension. Along these lines, we noted a reference to the heterogeneity of the people who experienced dropout and want to finish their compulsory education. This mosaic of students with different needs and interests is part of the complex web that composes today's YAE schools, placing even more pressure on them.

The current lines of action of this modality do not offer a comprehensive solution for the different student trajectories converging in this educational space. Instead, actions and results are confusing, with poorly defined goals, usually with a market orientation and managerial style that do not ensure the long-term continuity of the modality nor offer access to a decent way of life for those passing through YAE.

At this point, the first integration was performed, as there is a macro-level analysis (national reports and policies and laws) of the context and the problem. Based on these initial results, theoretical criteria were identified to select schools that would be invited to participate in a sequential ethnographic study of dropout in YAE, leading us to the digging and building phase.

### 3.2. Digging and building phase

#### 3.2.1. Identifying risk and protective factors

Using multilevel modeling, we identified a risk population that could dropout of YAE, reflecting a dropout culture. The predictive model identified at the individual level a demographic scenario of men aged 19–25; with low GPA, low attendance, and special educational needs; and belonging to ethnic minorities or migrant populations. At the school level, we recognized institutional factors protecting against school dropout, such as low student–teacher ratios and integration and participation strategies; at the macro level, having more support and resources to strengthen learning was also associated with lower dropout in YAE (Contreras-Villalobos et al., 2023a).

Extensive knowledge of dropout suggests the need for detailed and specific knowledge via a case study, with the goal of intensifying our understanding of how dropout occurs in schools and educational communities in specific ways. Hence, in this part of the study, we focused on the previous political, cultural, and economic macro-levels that explain trajectories of dropping out. Thus, as we continued digging, our T-MMR informed design evolved toward qualitative documentary analysis and school ethnography. Still in the digging phase, the need arose for a deeper analysis: (a) at the individual level, examining the learning process, especially aspects that expose people to repeated risk of dropout; (b) of the conditions and experiences of exclusion, starting from characteristics such as gender, nationality, ethnic group, or educational needs; and (c) at the school level, analyzing the educational experience and links that can be built in the school space, where expectations and relationships with teachers affect the probability of dropout.

In coherence with a social justice, transformation-informed qualitative phase of the T-MMR design, our methodological decisions sought to ensure that all voices were recognized, listened to, and validated as equal, considering that we worked with the entire educational community (teachers, students, and school management staff). An example of this is that the data-gathering work with students—continuing with the transformative principles of MMR—included artistic and visual strategies.

This enabled us to explore a language that transcends the spoken or written word, offering the expression of feelings, traumas, abstract ideas, and experiences which would otherwise be more difficult to communicate (Pain, 2012). These strategies and techniques are highly relevant, given their symbolic dimension in creating other meanings and their co-construction through intersubjectivity in the production of the social (Cabruja et al., 2000). They act as catalysts for personal reflection and dialogue among participants and encourage participation and collaboration among individuals forming part of the research, leading to relationships that progressively move toward greater horizontality. Therefore, participants had the opportunity to express themselves creatively and autonomously, recognizing them as experts-by-design

(Fals-Borda, 2013), bringing the group and researchers closer together, and improving their connection and mutual trust. This aspect was key to dealing with problems that have marked people's identities, subjectivities, processes, and evolution.

The trajectories arising from dropout processes are complex and often painful to recall in interviews; hence, the need to be emotionally attentive and responsive as researchers, something that requires a more horizontal researcher-participant relationship. This enabled us to observe that this experience marked people deeply and painfully, distancing them from the learning process and educational system. Students constantly remembered episodes of segregation and inequality that they suffered. Findings showed that dropping out is built on systemic, chronic expulsion structures, because the stigmas and labels that weigh them down are still being reproduced. These do not operate only in academic terms but are also linked to the educational system and the actors and objects it contains. Alongside this discomfort were feelings of irrelevance that students associated with their experience in the educational system, a space that seemed alien to them, considering that nobody cared about their presence and subsequent departure.

As a response, a disciplinary identity emerged that referred to YAE teachers and professionals, who must adapt quickly to an educational modality with which they are not familiar. These professionals have—or develop over time—an ideology that is critical of the educational system, given the differences and inequalities it generates. This goes hand-in-hand with a strong emphasis on the work and support they produce through a flexible teaching practice. They attend to their students' needs and unique characteristics and build an ideal space for learning, a setting that includes sociocultural aspects that seek to reverse a dropout experience. In practice, this entails recognizing that educational paths are plural, tailoring teaching processes, engaging in ongoing mediation, adapting school curricula, and being available to talk.

Thus, the action of digging, as a first phase, involved the use of quantitative and qualitative methods in continuous, parallel, and later concatenated courses, developing the basis for a constructive proposal that could transform school dropout. Also, we could see the necessary intensive and extensive three-dimensional nature of the causes, effects, and agents involved in the phenomenon. It is here that T-MMR represents a unique contribution, because the design provided the basis for synthesizing an extensive and intensive perspective on the data obtained. In this way, T-MMR represented a creative approach to dig into the problem (Frost and Shaw, 2015) through the data gathering, enabling a nuanced explanation of the complexities of the subjective experience of those undergoing exclusion and dropout in the first person, as a path made up of incongruities and contradictions in terms of the educational model.

### 3.2.2. Building perspective

But just as construction work first needs a deep foundation, a transformative exercise with social commitment requires an integrative three-dimensionality that interweaves the quantitative and qualitative—extensive and intensive—inputs of the previous digging. The building phase integrated both findings into a comprehensive framework for transformation, emphasizing the need for systemic, context-specific changes, particularly in the way YAE is structured and delivered.

Thus, in this building stage, the quantitative phase enabled us to consider the population in the YAE modality that has undergone dropout and exclusion and the contextual and structural elements that could mark a difference. Using predictive models, we identified management elements, resources, and ratios that increase the probability of generating support for people to finish their compulsory education. The systemic reach of this method revealed the magnitude of the problem (Contreras-Villalobos et al., 2023a, 2023b).

Meanwhile, the qualitative phase, in its corresponding constructive drive, enabled us to understand intensively the local transformative practices that the educational communities and their different members

had developed to tackle the phenomenon. The approach allowed us to complement the perspective on the lack of resources and personnel, conditions of the infrastructure supporting teaching, difficulty of the work of training, and inclusive viewpoint of learning that had been established during the intensive and extensive digging process. But also, the qualitative intensity of digging highlighted the centrality of the emerging local processes, whereby the gradual construction of a link of trust between students and teachers or affection toward certain teachers and their teaching processes are conditions for the transformation of school dropout.

In this way, building, as a creative and transformative possibility, rests on an earlier product that is more than the sum of its parts. This is one of the virtues of T-MMR: the capacity for agency and creation in unifying quantitative and qualitative procedures and data, bringing to the surface approaches, routes, and possibilities for transformation that we pose are insufficient for the extensive quantitative approach and the intensive qualitative approach separately.

Following the guidelines for T-MMR in Mertens (2018, 2023b), in this study, we made sure to consider participants' needs and interests in the research design. As an axis for action, we added to the strategy the preparation and construction of participatory instances for data analysis and policy recommendations stemming from the results to co-analyze and above all, co-construct guidance for transformation and improvement in the final phases. Also, planning these instances drew attention to the need to be culturally responsible with collectives and people's characteristics.

Integration plays a pivotal role during data interpretation and inference-making, particularly in T-MMR. While integration is frequently emphasized during the final stages of interpretation and reporting, particularly in convergent mixed methods research, case studies, or studies addressing distinct but interrelated research questions (Fetters & Molina-Azorin, 2017; Newman and Houchins, 2018), it is important to recognize its potential at earlier research stages as well. Regardless of the timing, researchers must ensure transparent and deliberate integration to enhance the study's validity and transformative potential (Leko et al., 2023). In this study, the integration of data during the building stage exemplifies this principle by unifying quantitative and qualitative findings into a cohesive framework. The interplay between extensive and intensive methodologies in T-MMR underscores the necessity of integration to forge actionable insights that extend beyond the limits of isolated approaches. Thus, this integrative process reflects the foundational three-dimensionality required for constructing meaningful, context-sensitive changes in educational practice, thereby advancing this digging and building process with a view toward transformation.

### 3.3. T-MMR in practice against school dropout: using results for transformation

At the end of the study, building collaborative knowledge through a T-MMR informed framework involved creating different collaborative workspaces through participatory analytic roundtables that included students, teachers, and managerial teams. By using methodological techniques that dealt with the hierarchies of power in the possibility of speaking up during these four reflexive collective instances, participants could reflect with the research team on the findings, integrating quantitative and qualitative data to come up with proposed guidelines for improvement and transformation. In the final instance, we held an online seminar [link here] with speakers including figures in public administration, researchers, and representatives participating in the debate and analysis, which was viewed by 310 people throughout Latin America. During this seminar, participants gathered to receive research findings as feedback and participated in a reflexive process of searching for transformation and improvement of the modality and seeking ways to strengthen its efficiency in responding to dropout. In this manner, the online seminar was considered part of the data production technique

(not only as a final devolution of information) and analyzed as such.

As a final product of the integration of the T-MMR study, we constructed the joint display shown in Fig. 1. This display serves as a methodological innovation, offering a more nuanced and comprehensive approach to understanding the phenomenon of school dropout. By synthesizing insights from both quantitative and qualitative analyses, the joint display reinforces the processes of digging and building, enabling a more profound engagement with the study's findings. Structured as a circular matrix (Plano Clark and Sanders, 2015), it links phases, methods, and results while incorporating the perspectives of diverse stakeholders, ensuring a multi-dimensional view of the phenomenon.

Aligned with Greene's (2024) objectives for mixed methods research, this figure strives to generate novel insights, organize and streamline the research process, and validate the study's rigor through triangulation. Furthermore, it provides a foundation for reporting that conveys a holistic perspective, fostering alternative opportunities for individuals impacted by school dropout. By integrating reflection and critical theory, the display evolves into a tool not only for interpretation but also for transformation, encouraging new ways of addressing the issue through both research and practice.

A core strength of the mixed methods approach lies in its capacity for synergy, which researchers achieve by identifying and leveraging the "value added" of combining methodologies to enhance study outcomes and conclusions (Fetters & Molina-Azorin, 2017). Meeting this principle signifies achieving a cardinal quality indicator in mixed methods research design. This approach also emphasizes equity, raising critical questions: Whose voices are being amplified? How are diverse perspectives incorporated into the research methods and analyses? Were participants protected in ways exceeding typical confidentiality protocols? Gage (1989) framed this focus as the moral obligation of

educational research, emphasizing that its value lies not in its paradigm but in the extent to which its benefits students and teachers, particularly those from minoritized communities. Contemporary perspectives further underscore the importance of this ethical commitment (Meyer and Schutz, 2020).

The first highlight in the systemic critical analysis by the community occurred at the macro level (Sphere 1), arguing that the system fails the students and leads them to drop out. Once expelled from the formal regular school system, those passing through YAE experience a highly precarious version of the education system, with low and varying budgets and without a plan for providing an educational experience in appropriate conditions. Throughout the different phases of the study, participants indicated that long-term support is needed to generate the changes required for the rehabilitation of those expelled from the system and the reconstruction of socioeducational connections.

But they viewed the consequences of social and educational exclusion, and the precariousness of the system and this educational process, as not only economic but also present in the subjective experience of the YAE community (Sphere 2). This translates to feelings of suffering and pain among teachers and school professionals, who are oppressed by heavy emotional and moral burden. Although this situation is perceived by participants as extremely frequent, they also highlighted that it can be recognized, accommodated, and dealt with to reverse the naturalization of exclusion. Considering the analysis of the diagnosis of dropout in YAE, in dialogue with the meanings, experiences, and practices in the context of the critical issues constraining its work, the study went on to construct guidelines for improvement and transformation (Sphere 3). Among the new elements, participants and the research team construed two major strategies: (a) considering YAE as a safe space that cares for all and (b) promoting collectivity and agency as a response to dropout.

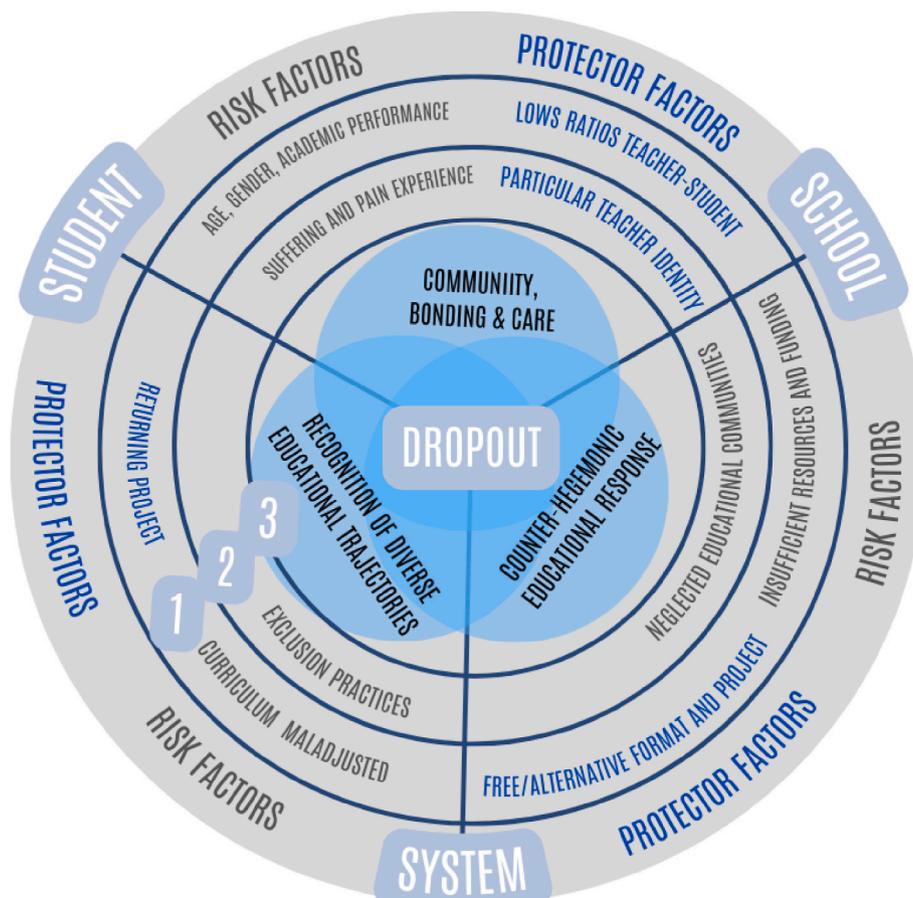


Fig. 1. Joint display of integration and understanding of educational dropout: Our T-MMR building.

#### 4. Discussion: Between the foundations and pillars of transformation

The innovation of this research lies in its ability to respond to the complexities of school dropout through the T-MMR framework. Returning to the guiding questions—How does T-MMR contribute to understanding dropout? What is its specific contribution to transformation and improvement?—our findings indicate that T-MMR enables a comprehensive approach to tackling complex social problems by combining data digging and knowledge building. This approach integrates diverse perspectives, methodological tools, processes, and relational insights in a dynamic progression aimed at both understanding and transforming dropout.

MMR transcends the integration of qualitative and quantitative methods, weaving together distinct philosophies in both process and purpose (Love and Corr, 2022; Fetters, 2016). With T-MMR, this integration takes on an intentional transformative emphasis. The approach explicitly seeks to create alternative opportunities for action and innovation, advancing the practical goals of research. By doing so, it fulfills not only the theoretical aspirations of MMR but also its real-world applications for addressing entrenched social issues like school dropout.

Rigor in mixed methods research is multifaceted, encompassing trustworthiness for qualitative findings, reliability and validity for quantitative results, and demonstrable integration of both components into a cohesive whole (McCrudden et al., 2019). This methodological robustness allows for the exploration of nested phenomena—those deeply embedded within layered social and institutional contexts—frequently encountered in education. The application of multiple worldviews and methodologies enables researchers to navigate the inherent paradoxes of combining quantitative and qualitative approaches, leveraging their complementarity, developmental potential, expansion, initiation, and triangulation (Meyer and Schutz, 2020). These overlapping purposes make mixed methods research particularly valuable in fields like educational psychology, where nuanced understanding is essential.

Investigating the phenomenon of dropout at multiple levels—contextual, structural, and interpersonal—through a T-MMR framework generates alternative outcomes by adopting a systems perspective. This approach emphasizes deliberate and participatory processes that address structural dimensions of schooling, including practices, relationships, and care. By doing so, it becomes a powerful tool for analyzing diverse experiences and focal points in educational research, particularly those related to equity and psychological well-being (McCrudden and Marchand, 2020).

In its application to school dropout, T-MMR enables us to integrate data exploring the specific experiences and challenges of students in different sociocultural contexts who undergo the crudest version of exclusion. This approach seeks to not only understand the phenomena but also transform it, empowering the affected communities (Mertens, 2018). Also, the combination of methods in T-MMR lets us design more effective and contextually appropriate educational interventions, paving the way for improvement.

Thus, this design includes an ethical, inclusive perspective that deals responsibly with the collectives with which it works, a crucial element when researching exclusion and dropout among vulnerable students who are now in YAE. Therefore, T-MMR contributed to the understanding of school dropout, enabling a complex exploration of the phenomenon. On one hand, the extensive quantitative analysis allowed the identification of demographic patterns, risk factors, and institutional practices that correlate with dropout. This comprehensive mapping provided a broad, systematic view of how exclusion operates at different levels (Calvo, 2021; Rodríguez et al., 2023).

On the other hand, the intensive qualitative component of the study offered insights into lived experiences, adding depth to our understanding. The voices of marginalized students and YAE communities were amplified, revealing the emotional and psychological dimensions

of educational exclusion. This qualitative aspect of the research focused on how these individuals perceive their educational trajectories, often marked by feelings of alienation and institutional neglect (Contreras-Villalobos et al., 2023c; Mertens, 2019). As a result, systemic inequities that shape their experiences were underscored, alongside the urgent need for structural change.

Thus, the contribution of T-MMR to understanding dropout is twofold: It provided the breadth of quantitative analysis to identify systemic trends, the depth of qualitative inquiry capturing the nuanced experiences of exclusion, and additionally possibilities for producing micro-spaces of transformation through collective, participatory data analysis, and recommendations for policies and practices. This integration enabled a holistic comprehension of school dropout as not only an individual failure, but also a consequence of broader socioeducational systems that fail to support vulnerable students, allowing agency through participatory data analyses and proposition processes. In other words, this holistic comprehension went beyond mere diagnosis by involving the educational communities—students, teachers, and policymakers—in the process of constructing solutions (López et al., in press).

In this sense, the participatory latter phase of the T-MMR design, particularly the building phase, ensured that the voices of those most affected by dropout become central to the construction of knowledge and its consequent development of responses to school dropout. This collaborative co-construction of knowledge reflected that T-MMR allows not only describing and understanding complex social problems, but also enables research to become a tool for transformation. By applying a justice-oriented framework, this research offers a new direction for MMR, one that directly engages with the ethical and political dimensions (Mertens (2018; 2020) of educational exclusion. This combination reinforces T-MMR's capacity to adapt to complex social phenomena, making it an essential tool for addressing issues like school dropout that demand both breadth and depth of understanding (Creswell and Plano Clark, 2018; Fetters et al., 2013). Therefore, based on the aforementioned transformation metaphor of digging and building, there can be a process of recognition of people's rights by repairing bonds and learning from lived experiences through the process of research.

This is what the joint display (see Fig. 1) underscores, highlighting how YAE seeks other ways to educate. This can be achieved by implementing inclusive approaches and reimagining organizational and teaching structures that challenge the perceived shortcomings of mainstream education. In practice, this involves a variety of daily actions within Youth and Adult Education that generate alternative responses, tailored to meet the diverse needs of individuals. These actions aim to address and begin to heal the traumatic experiences caused by exclusion within the conventional education system. Equally crucial is the commitment to embracing complexity and amplifying marginalized voices through research methodologies. This approach supports educators and researchers from diverse backgrounds and perspectives, encouraging the integration of multiple worldviews and the ability to work effectively within dynamic and ever-changing contexts (Bobbit, 2020).

Finally, we would like to point out that in our study, T-MMR had the capacity to dig and build, which allowed not only an in-depth exploration of the educational situations experienced by those undergoing exclusion, but also the construction of specific and precise transformative solutions. This methodological approach emphasizes equity, inclusion, and active participation, something fundamental to dealing with a problem so complex and deeply rooted in society as pervasive dropout and offers a way forward to a more just and humane education system, committed to rights, transformation and improvement. As future lines of work and research, we propose using the T-MMR framework to follow those actions identified as responses to educational dropout and thus, reinforce diverse educational trajectories.

## CRedit authorship contribution statement

**Tabata Contreras-Villalobos:** Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Enrique Baleriola Escudero:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Verónica López Leiva:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

## Declaration of competing interest

Authors have nothing to declare.

## Acknowledgements, contributions and Fundings sources

This work was supported by SCIA ANID CIE160009, FONDECYT Regular 1240886, and Ministry of Science and Innovation. Grant project: PID2021-127076OB-I00.

All the corresponding authors contributed in the conceptualization, investigation, methodology, discussion and writing.

## Data availability

The data that has been used is confidential.

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