Assessing Comprehensive School Transformations in Barcelona: Progress and Challenges in Educational Equity

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Abstract

In recent decades, Spain and other European countries have introduced liberalising reforms in school allocation to improve the quality of education and increase families' freedom of choice. In Catalonia, however, these measures have increased school segregation, particularly in Barcelona. To address this policy challenge, the Barcelona Education Consortium (CEB) has implemented initiatives such as Comprehensive School Transformations. These targeted interventions focus on schools facing low demand or high complexity, with the dual goals of increasing their attractiveness and fostering greater educational equity. This evaluation examines whether and how these transformations are associated with changes in segregation and school-level conditions linked to educational quality. The methodology combines quantitative and qualitative analysis, using CEB data (2018-2023) and interviews with key stakeholders, including headmasters, teachers, families and students. The results show that these transformations have improved infrastructure and educational provision and are accompanied by declines in segregation indicators in most intervention catchment areas. However, challenges remain, such as construction planning, teacher coordination, and socio-economic and cultural barriers that hinder the participation of diverse families. In addition, some schools have experienced a 'pull effect', attracting families from higher socio-economic backgrounds, which could lead to new forms of segregation. The study concludes that while the initial results of this policy are positive, a more comprehensive and sustained approach is needed to ensure long-term inclusivity and equity.

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1. Introduction

In recent decades, the increasing adoption of market-oriented reforms in school allocation systems across several European countries reflects a policy trend aimed at enhancing families' freedom of choice (Cordini, 2019). While Spain has historically maintained a system based on school choice since its democratic transition (Olmedo Reinoso & Andrada, 2011), the specific implementation of this model varies regionally. The emergence and evolution of these choice-based systems have generated significant scholarly interest, particularly regarding their consequences for school segregation. A growing body of research indicates a link between the liberalisation of school allocation and increased segregation, potentially worsening existing patterns of educational polarization (Ayed, 2009; Cordini, 2019; Gibson & Asthana, 2000).

Existing comparative studies, utilizing PISA data, position Spain as having a moderate level of school segregation within Europe (Ferrer et al., 2008). However, significant regional disparities exist within Spain, with Catalonia exhibiting one of the highest levels of school segregation, ranking third nationally behind Madrid and the Canary Islands (Murillo & Martínez-Garrido, 2018). Although Barcelona, Catalonia's main city, operates a school choice system within 29 school catchment areas (SCA), creating complex local schooling dynamics (Bonal & Zancajo, 2020), recent data from 2018 to 2022 indicate a modest reduction in segregation among early childhood education entrants (Institut Metròpoli, 2023). This pattern aligns with recent evidence that Barcelona's shift toward a more controlled choice model, through instruments such as targeting, admission quotas, and related allocation mechanisms, has reduced the uneven distribution and isolation of socially disadvantaged students (Zancajo et al., 2026).

The drivers of school segregation in Barcelona are already well established in the literature, and the more policy-relevant challenge is identifying which interventions reduce segregation in practice, through what pathways, and under which conditions. Even moderate levels of segregation can produce cumulative inequalities in academic outcomes and social integration opportunities (Bonal, 2012), and previous research has shown that small increases in segregation can disproportionately impact disadvantaged groups (Murillo & Belavi, 2021; Owens, 2018; Quillian, 2014). Moreover, the persistence of localized segregation pockets, despite aggregated improvements, underlines the need to evaluate targeted interventions that move beyond traditional compensatory policies (Bonal & Bellei, 2023). In this context, it becomes crucial to assess whether comprehensive, school-level strategies can act as levers for altering family choice patterns and reshaping school demand dynamics in favour of greater equity.

In response to the persistent challenge of school segregation, the Barcelona Education Consortium (CEB) initiated several targeted programmes, including the Shock Plan against School Segregation (Bonal et al., 2021) and the Comprehensive School Transformations (launched in 2018). The Comprehensive School Transformations represent a key strategy, providing holistic interventions in schools with low demand, high complexity, or significant segregation. Their primary aim, alongside ensuring equitable and high-quality education for all Barcelona students, was to increase the attractiveness of these schools for middle-class families, thereby reversing the trend of families with greater educational and economic capital choosing other options. This was achieved through integrated changes in management, teaching staff, physical infrastructure, educational programmes, and the establishment of primary-secondary continuity pathways (Instituts Escola - IEs).

Given the unique characteristics of Barcelona's school choice system and the novel approach of these comprehensive transformations, this study aims to examine whether and how these transformations are associated with changes in school segregation and enrolment dynamics and identify key enabling and hindering factors by addressing the following key questions: What changes are observed in school segregation and educational equity in SCAs where Comprehensive School Transformations were implemented? What specific factors contribute to, hinder, or prevent the successful implementation and intended outcomes of these transformations? By answering these questions, this evaluation will contribute to a broader understanding of public policies aimed at combating school segregation, offering novel evidence on a relatively understudied strategy: comprehensive school-level improvements intended to reshape demand, including the choices of middle-class families. Furthermore, this study will explore the processes and mechanisms through which the policy's objectives are (or are not) achieved, providing insights into the implementation and contextual conditions that facilitate or constrain results, and discussing how school-level transformations may interact with other approaches to reduce school segregation.

2. Reducing school segregation: factors, effects and strategies

School segregation, defined as the unequal distribution of students based on individual characteristics, leads to disparities in opportunities and reinforces social inequalities by affecting access to resources and educational experiences (Murillo & Martínez-Garrido, 2018; Reardon, 2016). This is particularly detrimental for socio-economically disadvantaged students, whose learning outcomes tend to suffer in segregated schools, while no significant academic advantages have been observed for advantaged students in schools with fewer disadvantaged peers (Brunello & De Paola, 2017; Reardon & Owens, 2014). In fact, the literature suggests that attending schools with a high concentration of high-achieving students does not consistently result in better academic performance (Benito et al., 2014; OECD, 2019). Reducing school segregation is therefore a desirable policy objective, since it benefits disadvantaged groups without harming others, producing net gains in equity and social cohesion (Reardon & Owens, 2014).

While some level of segregation may be unavoidable due to the natural spatial distribution of different groups, the phenomenon is often amplified by educational policies and school-level practices (Johnston et al., 2006; Saporito, 2003). Evidence shows that school segregation frequently exceeds residential segregation, particularly in primary education and among ethnic minority groups (Johnston et al., 2006). This suggests that reducing school segregation requires addressing both spatial and institutional mechanisms.

Empirical evidence indicates that school segregation is primarily driven by middle-class families seeking to avoid diversity (Saporito, 2003). Social composition (ethnic and class) is a common criterion for school choice among these families, often motivated by a desire to be with “people like us” and to avoid “bad company” (Boterman, 2013). Preferences for academic standards, school reputation, and school climate also factor into these decisions, often based on subjective perceptions rather than objective quality indicators (Allen & Burgess, 2013; Gibbons & Machin, 2003). According to Cordini (2019), this pursuit of social homogeneity appears consistently across different institutional contexts. Similarly, the reviewed literature confirms that white families tend to avoid schools with higher percentages of non-white students, reinforcing both racial and socioeconomic segregation (Palardy et al., 2015; Saporito, 2003).

On the other hand, high concentrations of socially disadvantaged students can undermine confidence in the education system and foster negative attitudes toward school among families from lower socio-economic backgrounds (Galster,

2011; Owens et al., 2016). This may result in more passive attitudes toward school choice or reliance on nearby schools, which exacerbates stratification. However, informational interventions have shown that disadvantaged families can modify their preferences when provided with accessible and relevant information on school performance (Allen et al., 2014). Still, as Cordini (2019) and Alegre (2017) point out, such interventions have delivered limited results when not accompanied by structural reforms.

This combination of proactive avoidance among advantaged families and passive or constrained behavior among disadvantaged ones creates a divergence in school choice strategies. In contexts with high levels of choice and autonomy, such as those where schools can select students or impose complex admission criteria, these dynamics often lead to increased segregation (Alegre, 2017; Söderström & Uusitalo, 2010). The literature documents that reforms intended to liberalize access—such as open enrolment policies—can have unintended consequences, as illustrated by the Stockholm case, where new admissions criteria exacerbated segregation by ability, family background and immigrant status (Söderström & Uusitalo, 2010).

While a substantial body of research has focused on understanding the mechanisms and effects of school segregation, there is a growing literature on strategies to reduce it. The OECD (2019) recommends controlled choice policies, such as reserving seats for disadvantaged students in high-demand schools or using lottery-based allocation mechanisms. They also emphasize simplifying enrolment procedures, increasing transparency, and monitoring criteria to prevent "cream skimming" practices. Benito et al. (2014) show that efforts to reduce socioeconomic segregation can improve educational equality across multiple national contexts. Similarly, Reardon and Owens (2014) find that desegregation policies implemented in the U.S. led to improved outcomes for black students without harming their white peers.

Some scholars argue that reducing school segregation in Barcelona would require undoing the effects of the 2006 and 2012 educational reforms and promoting a proximity-based school assignment system, eliminating existing district boundaries to ensure more equitable access (Bonal & Zancajo, 2020). In line with this view, the literature reviewed by Alegre (2017) highlights the potential of quota systems that reserve places or cap admissions according to the demographic composition of the surrounding population, an approach that has recently been examined in Barcelona through targeting and hard quota design within a controlled choice shift, with documented reductions in segregation among socially disadvantaged students (Zancajo et al., 2026). However, their effectiveness depends heavily on enforcement mechanisms and accompanying measures to ensure compliance. There is broad consensus that strategies to combat segregation should not be limited to the education sector. Cordini (2019) argues that structural determinants—such as housing, urban zoning, and local infrastructure—have a direct influence on school composition and should be integrated into educational policy design. Similarly, Reardon (2016) underscores the need for multi-level approaches that combine family support, school governance reforms, and urban policy instruments.

Finally, a less frequent yet increasingly relevant line of intervention focuses on improving the quality of education in segregated and under-demanded schools. Bonal (2018) stresses that educational planning cannot succeed without transforming these schools into attractive, high-quality learning environments. Without reinforcing their pedagogical projects and raising expectations among teachers and families, strategic reforms are unlikely to change enrolment patterns. Palardy et al. (2015) reinforce this view, demonstrating that academic climate and peer dynamics mediate many of the adverse effects of segregation and that school-level interventions can mitigate some of these outcomes.

3. Comprehensive School Transformations as a policy

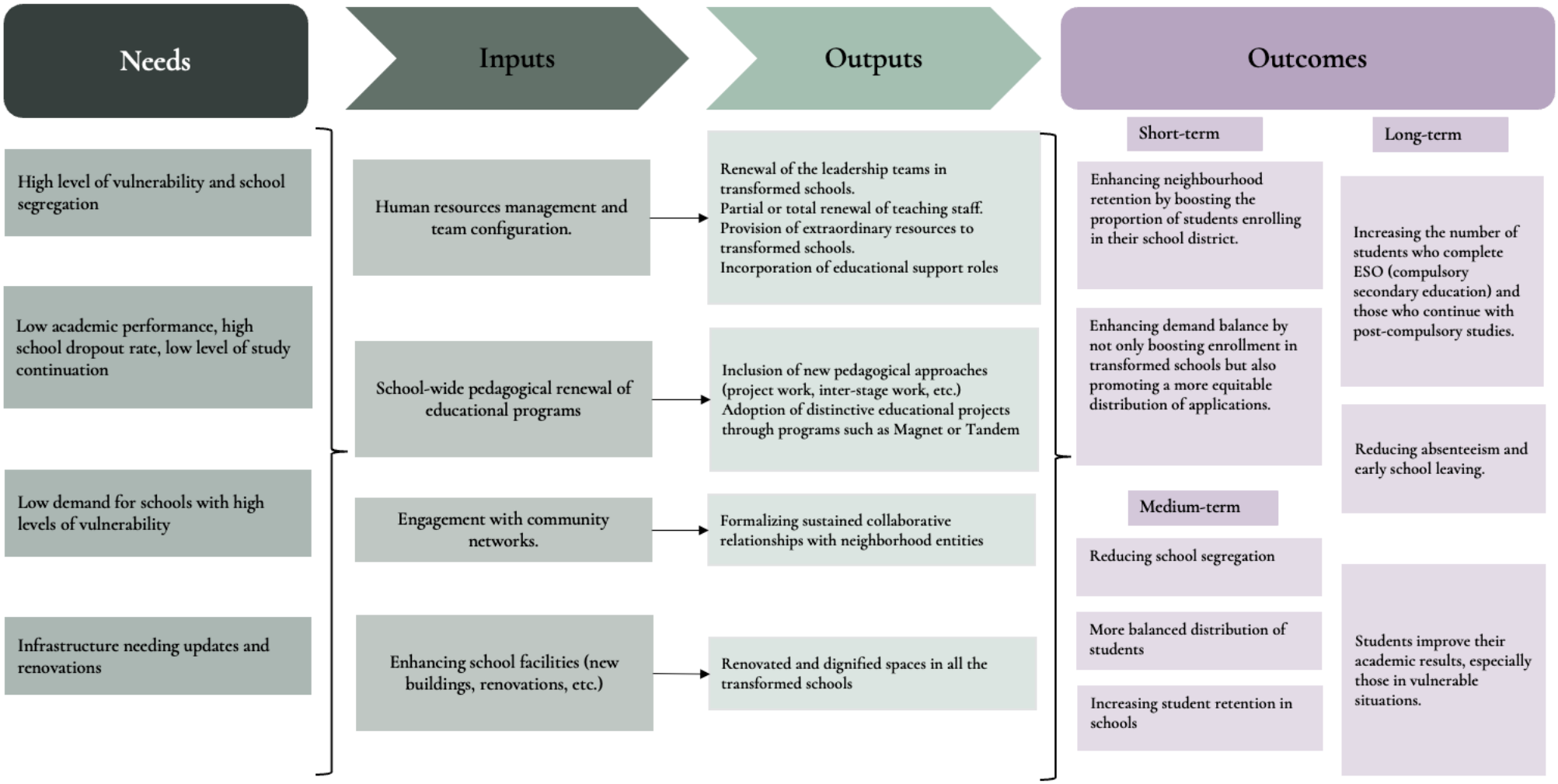
Addressing the complex and persistent challenge of school segregation in Barcelona requires integrated and collaborative solutions. In recent years, CEB has spearheaded a multi-faceted strategy aimed at enhancing educational equity and reducing segregation across the city's school system. This strategy encompasses several key initiatives designed to create a more balanced and high-quality educational landscape. These actions include the following:

- Strengthening Public Education: Expanding public school places (9,460 created via new schools, deprivatization of some charter schools and their integration into the fully public network, and IEs), increasing demand for public options.
- Ensuring Educational Continuity: Simplifying the continuation from primary schools to secondary school in accordance with criteria of pedagogical coherence and territorial proximity and the creation of IEs.
- Implementing a Desegregation Plan: Utilizing measures like improved detection, balanced distribution of vulnerable students, and financial aid, reportedly achieving notable reductions in segregation since 2018.
- Fostering School 'Equivalence': Aiming for all local schools to be perceived as high-quality choices, supported by programmes (Networks for Change, Magnet, Tandem, etc.), mentoring, and facility upgrades.

This evaluation specifically examines the CEB's 'Comprehensive School Transformations' policy, intensive interventions impacting over 12,000 students across 10 SCAs. These interventions involve 33 schools through restructuring, mergers, or new creation, and/or school catchment areas-wide changes.

The core Theory of Change (ToC) states that these transformations enhance school quality and attractiveness, fostering equivalence. This perceived and actual equivalence is expected to shift families' choice towards neighbourhood options (proximity schooling), leading to a more balanced student distribution within the SCA. Ultimately, this reduces segregation systemically, benefiting the entire SCA, not just the transformed schools. The hypothesized causal chain is visually detailed in the following diagram.

Figure 1. Diagram of the Theory of Change of the Comprehensive School Transformations



Source: Own elaboration.

4. Data and methods

This evaluation employed a realist framework (Bhaskar, 2013; Louart et al., 2023), grounded in Critical Realism. This perspective posits that policies do not directly cause outcomes but introduce resources, constraints, or opportunities that, within specific contexts, activate mechanisms—actors' responses, choices, or interpretations—to generate results. Thus, the evaluation examined both the observed changes associated with the educational transformations and the contextual and institutional processes that shaped those patterns.

Realist evaluation encourages integrating diverse techniques tailored to test and refine the programme's assumptions (Louart et al., 2023). Accordingly, this evaluation used a ToC to frame the analysis. A ToC articulates the intended causal pathways linking policy inputs to expected outcomes, including the underlying assumptions, contextual dependencies, and intermediate steps (Blasco, 2009; Farré et al., 2020). In this evaluation, the ToC served as a conceptual scaffold to identify key domains of change, guide indicator selection, and structure the interpretation of findings in relation to the policy's intended effects.

The evaluation covered the period from September 2018 to June 2023 (five academic years) and integrated multiple data sources and techniques. A systematic documentary review traced the origins and evolution of the transformations and contextualized the interventions within broader educational and territorial policies. The analysis employed both quantitative and qualitative methods.

The quantitative analysis measured changes in key outcome variables—including school segregation and enrolment patterns—by comparing transformed schools with control schools at both the SCA and city levels. This analysis relied on a quantitative database constructed from administrative records from CEB, specifically the Register of Vulnerable Students (RAV) and the Register of Students of Catalonia (RALC). Descriptive statistics and regression analyses were applied to understand the evolution of these variables and the relationship between the transformations and trends in segregation and demand.

To measure school segregation more precisely, the evaluation employed the Dissimilarity Index, a widely used indicator in segregation studies (Bonal, 2018; OECD, 2019). This index, ranging from 0 (perfect equality) to 1 (maximum inequality), estimates the percentage of a target group (in this case, vulnerable students) who would need to change schools to achieve an even distribution across the educational territory. Conventionally, values below 0.3 indicate low segregation, values between 0.3 and 0.6 moderate segregation, and values above 0.6 high segregation. The Dissimilarity Index enables robust comparison over time and across different SCAs, offering a clear metric of structural change in the spatial distribution of vulnerable students.

Dissimilarity is useful for comparing segregation changes across SCAs but cannot estimate causal effects, as it ignores endogeneity and spillover concerns. Estimates may be biased if families with higher socioeconomic capital are the first to respond to perceived improvements in school quality, potentially generating new stratification dynamics. Furthermore, because transformations were implemented in different years and overlapped with other policies aimed at reducing school segregation, it is not possible to isolate an effect attributable solely to the policy under evaluation.

Alongside the analysis of school segregation, three main analytical lines were defined: student retention within their SCA, demand for transformed schools and their SCA, and school-level organizational changes. These dimensions,

which reflect the internal dynamics of the SCA, were selected to assess the broader impact of the interventions on student trajectories and institutional practices. Where systematic data were unavailable —particularly for organizational processes— supplementary indicators were constructed based on a survey administered to the management teams of the transformed schools.

Prior research suggests that group-based interventions often generate non-linear and heterogeneous effects. In practice, this implies that the impact of transformations may vary according to the initial composition of the group and the local institutional environment (Duflo et al., 2011; Carrell et al., 2013; Booij et al., 2016). To account for this heterogeneity, baseline controls were included where feasible, specifically in the school-demand analysis, so that each school's trajectory is assessed relative to its initial level.

When interpreting quantitative results, two factors should be considered. First, the COVID-19 pandemic disrupted schooling between 2020 and 2022, affecting classroom functioning, attendance, and learning environments. Second, improvements in the CEB's vulnerability detection system between 2015–16 and 2020–21 led to a significant increase in the share of students identified as vulnerable—from 10.6% in 2018–19 to 18.6% in 2022–23. This change likely reflects improved identification practices rather than a genuine increase in vulnerability and may artificially inflate trends over time. To address potential distortions arising from changes in detection over time, student-level records were first linked across school years in order to construct a retrospective measure of vulnerability, whereby any student identified as vulnerable in at least one year was consistently classified as such throughout the observation period. In addition, all vulnerability measures were normalised so that each observation is expressed relative to the mean value of its corresponding year. This correction improves comparability across years, although it does not fully eliminate potential bias if improvements in vulnerability detection were not uniform across school types or subsystems. Under such circumstances, part of the observed convergence may still reflect differential changes in identification practices rather than only substantive shifts in vulnerability patterns. Additionally, the public subsystem consistently reported higher vulnerability rates than charter schools, which shaped the structure and impact of segregation patterns.

Given these constraints, the quantitative comparisons are interpreted as descriptive patterns and associations rather than isolated causal impacts. The evaluation's reliance on descriptive statistics and regression analyses, while appropriate for a realist evaluation framework, does not constitute a formal quasi-experimental design (e.g., Difference-in-Differences, Synthetic Control). The quantitative strategy therefore uses a descriptive counterfactual based on comparisons between transformed schools and non-transformed public schools within the same SCA and relative to citywide benchmarks.

Drawing on the peer effects literature (Manski, 1993; Sacerdote, 2001; Hoxby, 2000; Hoxby & Weingarth, 2005, Montalbán Castilla, 2025), the primary challenge in evaluating interventions that alter school composition is disentangling causal effects from confounding factors such as endogenous sorting, shared environments, or simultaneity—the so-called "reflection problem". This necessitates extreme caution when clarifying to what extent observed changes in school segregation or demand can be attributed directly to the interventions, as opposed to broader demographic trends, family self-selection, or concurrent policies. Three threats are particularly relevant in this context. First, concurrent policies and shared environments, since transformations overlapped with the Shock Plan against School Segregation, Pla de Barris, and PMOE, making it difficult to disentangle the specific contribution of school transformations from broader systemic changes. Second, endogenous sorting and "segregation from above," because more advantaged families may respond earlier to perceived quality improvements, generating new

stratification dynamics even when aggregate indicators improve. Third, measurement artefacts, since the increase in recorded vulnerability reflects improved detection and may affect trends if identification changes were uneven across schools or areas.

Given these identification limits, we interpret segregation and vulnerability-based indicators descriptively and do not report statistical significance tests or confidence intervals for these measures. We also note that additional robustness checks (e.g., placebo tests, sensitivity analyses, or synthetic-control approaches) and more systematic exploration of heterogeneous effects (for example by baseline vulnerability levels) would strengthen future work as longer follow-up becomes available. Therefore, the results presented must be interpreted as descriptive evidence of correlation and progress against policy objectives, rather than an estimate of isolated causal impact.

Regarding temporal and data constraints, the study covered five academic years (2018–2023). This relatively short span, combined with significant disruptions during 2020–2022 due to the COVID-19 pandemic, complicates the analysis. COVID introduced significant noise into indicators such as attendance, continuity in studies, and teacher stability, which might mask or mimic intervention effects. Furthermore, microdata on student academic performance were not available, so the evaluation could not assess changes in "educational quality" directly beyond stakeholder perceptions. To partially address this gap, we rely on trajectory-based proxies such as retention within SCAs and related enrolment dynamics.

The evaluation also incorporated qualitative methods to examine the effects of the transformations. A detailed actor mapping, developed in collaboration with the CEB, identified key stakeholders according to their level of influence, role in the implementation process, and stance toward the intervention (Tapella, 2007). This mapping informed the qualitative fieldwork, which was designed to unpack the mechanisms and contextual conditions underlying implementation.

The qualitative fieldwork stratified actors following the methodology of Purdon et al. (2001), distinguishing among macro-level actors (policy designers and institutional leadership), meso-level actors (programme managers, inspectors, and pedagogical advisors), and micro-level actors (teachers, students, families, and school directors). Data collection techniques were adapted to each level: semi-structured interviews were conducted primarily with macro-level stakeholders, focus groups with micro-level participants, and a combination of both with meso-level professionals. These instruments aimed to capture implementation experiences, emerging tensions, and the perceived effects of the transformations.

To deepen the analysis, three instrumental case studies were carried out following the approach proposed by Ruiz and Benítez (2016). These were not selected as exemplary cases but rather as opportunities to examine representative or critical dynamics in greater depth. In each case, additional interviews and focus groups were conducted with teachers, school leaders, and families. For student participants, the Mosaic approach (Clark & Moss, 2011) was adapted, using participatory and digital methods to elicit their experiences, perceptions of the changes, and evolving sense of belonging in the transformed schools. Below there is a summary table of the qualitative fieldwork (Table 1). The three instrumental case studies were selected to capture diversity in transformation pathways and implementation conditions, rather than to represent "best cases". The selection sought contrast across core features of the intervention, including merger-related dynamics, baseline levels of complexity and demand, and territorial context. The aim was to

support mechanism-based inference and analytical transferability within a realist framework, rather than statistical generalisation.

The qualitative data was analysed using a content analysis approach, following an inductive logic that allowed categories to emerge directly from the participants' discourses (Hsieh & Shannon, 2005; Vears & Gillam, 2022). After an initial reading and familiarisation with the material, open coding was conducted to identify relevant issues, which were subsequently grouped into broader categories reflecting the main analytical dimensions of the evaluation, such as governance, resource management, and perceived impacts (Assarroudi et al., 2018; Graneheim et al., 2017). Credibility and reliability were reinforced through cross-coding and team discussions to resolve discrepancies (Elo et al., 2014; Hsieh & Shannon, 2005). The final categories were not treated as isolated themes but as interconnected dimensions that together provide a comprehensive understanding of the transformation processes (Graneheim et al., 2017; Lindgren et al., 2020). Quotations from a range of actors were used to illustrate the findings, ensuring diversity and avoiding overrepresentation.

Table 1. Summary of participants in fieldwork

Participants	N
CEB Institutional Actors	10
Department of Education	2
Headmasters and teaching staff from the 11 transformed schools	54
Transformation advisors or support personnel	9
Families of Case Study A, Case Study B, and Case Study C	18
Members of the Les Corts School Council	4
Students of Case Study A, Case Study B, and Case Study C	10

Source: Own elaboration based on qualitative fieldwork.

Altogether, this mixed-methods strategy enabled the evaluation to combine breadth and depth, examining both implementation processes and measurable results. Quantitative analyses provided longitudinal and comparative data on key indicators, while qualitative fieldwork captured the human and institutional dynamics underpinning the observed effects. This design made it possible to assess not only whether the transformations worked, but also how they did so and under which conditions—reflecting the central concern of realist evaluation. Accordingly, the Results are organised to move from implementation conditions and processes to the main outcomes (demand, retention, and segregation-related patterns), interpreting the latter in light of the former.

5. Evaluation of implementation

5.1. Transformations

Participants in the fieldwork generally agreed that the implemented actions aligned with the initial transformation plans, although adjustments were necessary due to external pressures such as cost escalations and the COVID-19 pandemic. While the overall vision was preserved, these unexpected events led to shifts in priorities and scheduling, affecting the rhythm and structure of implementation across schools.

One of the most complex aspects of the process was the adaptation of physical spaces. School management teams and families expressed dissatisfaction with the handling of construction planning and phasing. Estimation errors and delays resulted in provisional solutions that were often inadequate—particularly in merged schools, where space constraints and connectivity issues were more acute. These shortcomings not only limited access to appropriate facilities but also disrupted the educational environment. Many participants in the fieldwork suggested that earlier and more substantive consultation with the school communities could have prevented some of these issues. The quote below illustrates this:

> *"During the change process, it was very complicated, we spent two years in temporary classrooms. There was a lack of information and a lot of uncertainty" (Family from a transformed school)*

While students appreciated the final outcomes, the process itself interfered with daily routines, especially by reducing access to leisure and sports areas during extended periods of construction. In pedagogical terms, all schools introduced innovations, including project-based learning and updated methodologies, often supported by participation in complementary programmes. However, translating these initiatives into consistent practice proved challenging. The diversity of staff backgrounds complicated coordination, and the transfer of training knowledge within schools was frequently uneven. These difficulties underscored the limits of one-off training efforts when not embedded in a broader strategy of collective learning and institutional development. The quote below exemplifies these challenges:

> *"The shift in pedagogical approach is being built gradually, improvising as they go along. Not only the leadership team but also the teaching teams are involved, using participatory dynamics and progressively implementing changes across different educational cycles." (School leadership team from a transformed school)*

The success of implementation was shaped by a range of external and internal factors. Externally, negative influences included contractor delays, teacher turnover intensified by stabilization decrees, pandemic-related restrictions, and the operational difficulties of managing schools across multiple sites. The absence of specialized spaces for certain activities further constrained the delivery of educational programmes. Conversely, targeted support through programmes such as Pla de Barris and the Educational Opportunity Improvement Plan (PMOE), along with the high-complexity classification of schools, provided essential resources that helped to sustain transformation efforts under difficult circumstances.

Internally, the capacity of each school to manage change was closely tied to the strength of its leadership, the coherence of its management team, and the degree of control over available resources. While participants in the fieldwork broadly agreed on the direction of change, the extent and pace of progress varied. Factors contributing to these differences included the cohesion and engagement of teaching staff, the degree of family involvement, success in building a shared institutional identity following mergers, improvements in physical environments, and efforts to anchor schools more deeply in their communities.

Timelines were frequently disrupted by a combination of construction delays, rising costs, bureaucratic obstacles, and the lingering effects of the pandemic. Consequently, many schools had to carry out works during the academic year, often converting communal or leisure areas into temporary classrooms. These disruptions compromised the quality of educational and social life within the schools and added pressure to already strained environments, highlighting the difficulty of aligning infrastructure upgrades with pedagogical and organisational change.

5.2. Resources

A broad consensus exists among participants in the fieldwork that the resources allocated to the educational transformations aligned with the identified needs of the schools. However, the ongoing nature of some transformations makes it difficult to definitively assess the long-term sufficiency of current funding levels. Several schools reported a lack of guidance on resource allocation, particularly during key transitional phases such as the shift to new institutional models (e.g., IEs), the execution of construction works, and the integration of teaching teams and student groups. This uncertainty around priorities and spending strategies hindered the strategic use of available funds. Many school management teams also expressed a need for more time to prepare their new educational projects and adapt physical spaces, especially concerning laboratories, workshops, and other pedagogically relevant facilities. The quote below illustrates this challenge:

> *"Sometimes schools have all the resources, but they are overwhelmed. This is good, but when there are too many resources, their impact becomes superficial." (Transformation advisor)*

In some cases, schools reported that the allocation of resources to temporary solutions, such as provisional teaching spaces, was disproportionately high, impacting budgets initially intended for permanent infrastructure. This was particularly problematic for schools operating across temporary campuses or those improvising facilities due to construction delays. In other instances, schools with large student populations faced regulatory limits that constrained access to additional human and material resources. Existing norms often fail to account for the unique demands of high-volume schools, particularly regarding the availability of management team positions, coordination roles across educational stages, and sufficient support staff. Consequently, even when resources were available, structural constraints prevented schools from accessing them.

Beyond the internal organisation of schools, participants in the fieldwork raised concerns about the adequacy of space-related investments. While improvements were noted, they were often considered insufficient, especially when schools attempted to align their internal learning environments with the external image and architectural integration within the neighbourhood. Achieving coherence between pedagogy, physical space, and community presence remains a key unresolved challenge in several cases.

According to information provided by CEB staff, a study on the financial viability of the transformation programme was conducted for the 2021–2026 period. Despite this, there is widespread concern among participants in the fieldwork about the potential discontinuation of complementary programmes crucial in supporting and consolidating the transformations. These include Pla de Barris and the PMOE, whose contributions have helped to compensate for structural limitations in core funding. Furthermore, participants expressed worry over the potential reduction or loss of resources associated with the classification of schools as “maximum complexity” schools, particularly if this designation is removed following changes in vulnerability indicators. One participant underlined the structural challenges faced by such schools:

> *"A substitute teacher can refuse a position at a maximum complexity school, but regular teachers or staff working there receive no additional benefits. There are no incentives beyond personal vocation." (Headmaster from a transformed school)*

Many advocated for stabilizing a portion of these additional resources to preserve the advances made and mitigate the impact of future reclassifications or policy shifts.

5.3. Governance

The governance and internal coordination among departments involved in the design of school transformations were generally assessed positively. Within CEB, collaboration during the initial planning phase occurred across various departments—namely Education and Territory, Corporate Services, Educational Resources, and Educational Facilities. This collaborative design process also included coordination with Community Services and the city's district councils, aligning educational transformations with broader urban strategies, such as synergies with programmes like Pla de Barris and other place-based interventions. This multi-actor approach facilitated the integration of educational planning with territorial and social development objectives before decisions were communicated to the schools involved.

Despite this initial alignment at the institutional level, governance challenges arose concerning the involvement of educational communities—particularly school leadership teams, teaching staff, and families. These groups consistently expressed a desire for a more active and deliberative role in the transformation process, rather than merely being informed after decisions were made. In several instances, CEB decisions were perceived as top-down impositions, lacking opportunities for dialogue or feedback. As one participant noted:

> *"It was something we did not want, and it came imposed by CEB; the schools were not consulted, they were simply told it would happen. It coincided with the pandemic year, and even so, the change was not postponed." (School leadership team from a transformed school)*

This perception contributed to resistance and tensions, not only between schools and CEB but also within school communities, particularly among families with differing views on the changes. Another participant described the lack of transparency during key decision-making moments:

> *"In December, the three school staff councils were closed, and at no point was the reason for the change explained. The HOW could be discussed, but the WHY could not be questioned. There was a lack of empathy and transparency with the schools' teaching staff." (School leadership team from a transformed school)*

Participants in the evaluation concurred that future transformation processes would benefit from more transparent and participatory governance mechanisms. They emphasised the need for earlier and more accessible communication about proposed changes, as well as the creation of structured spaces for resolving doubts, incorporating suggestions, and facilitating shared understanding. Strengthening this dimension of governance is considered essential to fostering legitimacy, ownership, and smoother implementation across diverse educational contexts.

Regarding the sense of belonging and identity in merged schools, governance dynamics were experienced not only as procedural issues but also as an identity shift. Fieldwork accounts highlight uncertainty and loss of reference points during the transition, often linked to perceptions of limited voice in the decision-making process.

These affective and identity-related experiences mattered because they influenced the sense of belonging and the willingness of families and staff to engage with the new institutional project. In several cases, pre-merger communities felt disconnected from the transformed school's orientation and were less present in formal participation spaces, contributing to persistent representational imbalances.

From a realist perspective, belonging operates as a mechanism that can either support consolidation through trust and engagement or constrain it when transformations are perceived as imposed and identity-disrupting. This suggests that participation is not only a governance feature but also a condition shaping how communities interpret and appropriate organisational change.

5.4. Satisfaction

Students participating in the evaluation generally expressed satisfaction with the outcomes of the transformations, particularly the new educational methodologies and the renovated spaces and equipment. These improvements were widely perceived as contributing to a more stimulating and modern learning environment, representing a break from traditional models, and aligning with their expectations of contemporary education. As one group of students noted:

> *"The changes that have taken place at the school have been a major improvement." (Students from a transformed school)*

However, students also highlighted negative aspects of the transformation process, especially during implementation. The most frequent complaint was the disruption of concentration due to construction noise, dust, and the presence of workers. Relocation to temporary buildings due to space constraints was described as inconvenient and disorienting. As described by students:

> *"The spaces provided during the construction works were insufficient, and the conditions were inadequate. Noise and dust made concentration very difficult."(Students from a transformed school)*

These disruptions were not only logistical but also emotional, contributing to a sense of instability during critical periods of their schooling. Satisfaction levels varied among student groups. Students from merged schools evaluated the changes more critically than their peers from other schools in the area. While the latter generally appreciated the upgrades and innovations, students from merged schools were more likely to frame their experience in terms of loss—of identity, space, or routines—and to associate the transformation with disruption rather than renewal. These differences suggest that the perception of change is shaped not only by its material outcomes but also by the conditions under which it is introduced and the histories of the communities involved.

Overall, while students viewed the results of the transformations positively in terms of infrastructure and pedagogy, the implementation process—particularly the disruptions caused by construction and the emotional impact of institutional changes—affected their satisfaction unevenly. These findings underscore the importance of considering the temporal and affective dimensions of transformation, especially from the perspective of those most directly affected.

6. Evaluation of results

6.1. School segregation

To mitigate inconsistencies in the identification of student vulnerability over the study period, and to improve comparability under pandemic-related disruption, we linked student-level records across school years and classified as vulnerable any student identified as such in at least one year of observation. We then constructed a normalised vulnerability measure. For each year, the value observed in the target centres was divided by the city-level vulnerability measure for that same year. This procedure yields an annual relative indicator that benchmarks the target centres against the overall city context, providing a more stable and temporally comparable measure of the groups' relative positions throughout the study period.

As shown in Figure 2, transformed public schools exhibit a higher normalised vulnerability than non-transformed public schools within the same intervened SCAs throughout the period. The gap does not close, but both groups move towards lower relative vulnerability by the end of the study window. Between 2018–2019 and 2022–2023, the normalised vulnerability decreases by about 18% for transformed public schools (from 1.96 to 1.61) and by about 12% for non-transformed public schools (from 1.46 to 1.29).

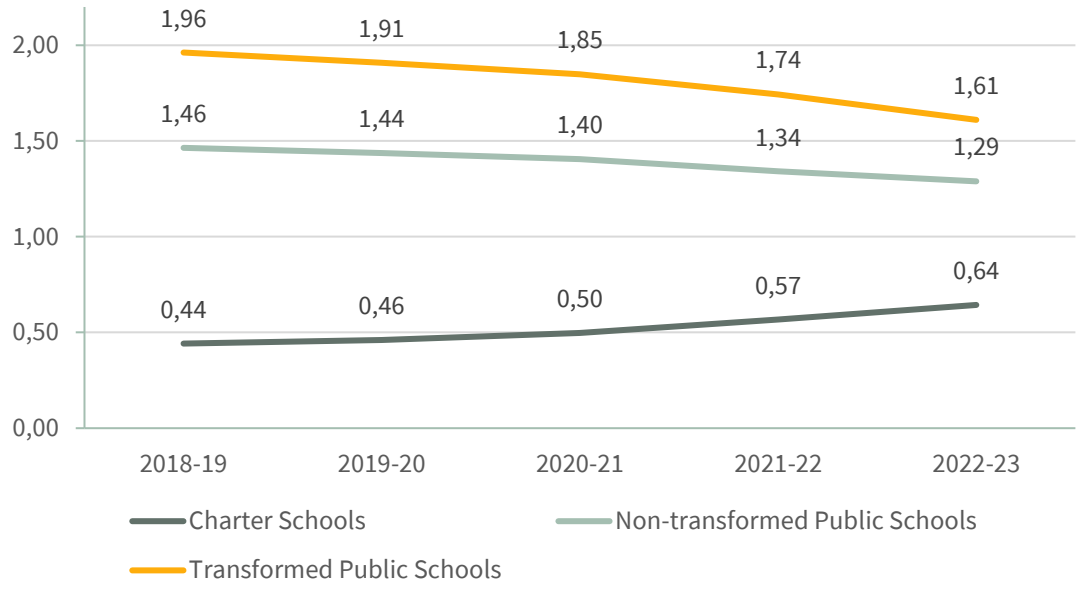
By contrast, charter schools in these SCAs show an increase in normalised vulnerability of roughly 46% (from 0.44 to 0.64), which contributes to some convergence across the three groups. In ratio terms, the normalised vulnerability of public schools that were later transformed was about 4.4 times that of charter schools in 2018–2019 (1.96 vs 0.44), falling to about 2.5 times in 2022–2023 (1.61 vs 0.64).

These changes were accompanied by a broader decline in the overall level of school segregation. In parallel with other concurrent policies (e.g., Pla de Barris, PMOE, and the Shock Plan against School Segregation), most SCAs where transformations took place saw a decrease in dissimilarity levels over the study period[1]. Even areas with more moderate changes, such as SCA15, exhibited measurable improvements beginning in the 2020–2021 academic year. In contrast, SCA07 stands out as an exception: despite the creation of new schools, the distribution of vulnerable students remained virtually unchanged.

One of the most notable outcomes was observed in SCA06, where the Dissimilarity Index fell by 43% between 2018 and 2023. This SCA shifted from being the most segregated among those analysed to approaching the threshold for what is considered low segregation. By the end of the period, all intervention SCA had lower segregation levels than at the outset, and seven out of ten had achieved Dissimilarity Index scores below 0.3—the conventional benchmark for low segregation. These trends are detailed in Figure 3, which illustrates the decline in segregation levels across the intervention SCA over five academic years.

[1] Although significant increases in segregation can be observed in some school catchment areas, such as SCA15, it is important to note that these increases occurred prior to the intervention in that school catchment area. All SCAs currently show lower levels of school segregation compared to before the interventions.

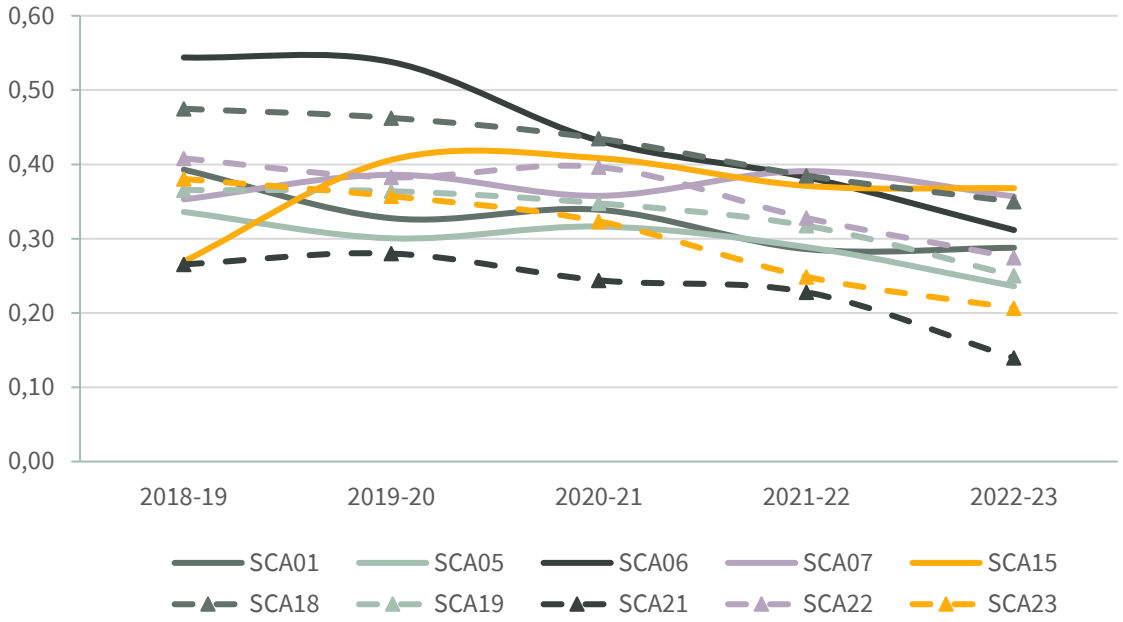
Figure 2 Trends in the normalised vulnerability measure by school group within SCAs where school-level transformations occurred (2018-2022)



Source: Own elaboration based on data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

Notwithstanding these patterns, the evidence does not allow for a causal attribution of the observed reductions in segregation to the school transformations through statistical techniques. Over the same period, segregation declined more broadly across the city, likely reflecting the combined influence of multiple concurrent policies and contextual dynamics beyond the intervention areas. In addition, the time elapsed since the transformations is limited, meaning that only a relatively small share of students currently enrolled in transformed schools entered after the intervention was implemented. As a result, any potential effects on aggregate segregation indicators are likely to be partial and still unfolding, which constrains the feasibility of isolating the specific contribution of the transformations within the available observation window.

Figure 3. Evolution of the Dissimilarity Index in the SCA affected by some transformation



Source: Own elaboration based on data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

6.2. Schools' dynamics

The analysis of schools' dynamics focused on changes in student retention within SCA, the evolution of school demand, and internal organizational aspects of the transformed schools. Overall, the SCA retention rate—defined as the proportion of students residing and enrolling in schools within the same SCA—followed a downward trend similar to that observed across the SCA under analysis. However, three SCA experienced sharper declines than expected following the transformations. In SCA15, SCA19, and SCA22, retention rates fell by 4.3, 7.0, and 9.2 percentage points, respectively, compared to pre-intervention levels. Particularly concerning is the case of SCA15, where retention in Compulsory Secondary Education (ESO) dropped to 49.5%, making it the only SCA in which more than half of the students are enrolled in schools outside their assigned SCA2. These patterns are detailed in Table 2 and are further illustrated in Figure 4.

2 While the causes of this phenomenon have not been established and examining them falls outside the scope of this study, two factors may plausibly have contributed to this pattern. First, local topography may have played a role, as SCA15 is situated around a hill with steep slopes. Second, the presence of an elite school in an SCA with vulnerability levels above the city average may also have shaped the observed distribution, particularly because students residing within the SCA constituted only a minority of its enrolment, thereby reducing the effective availability of school places for local students.

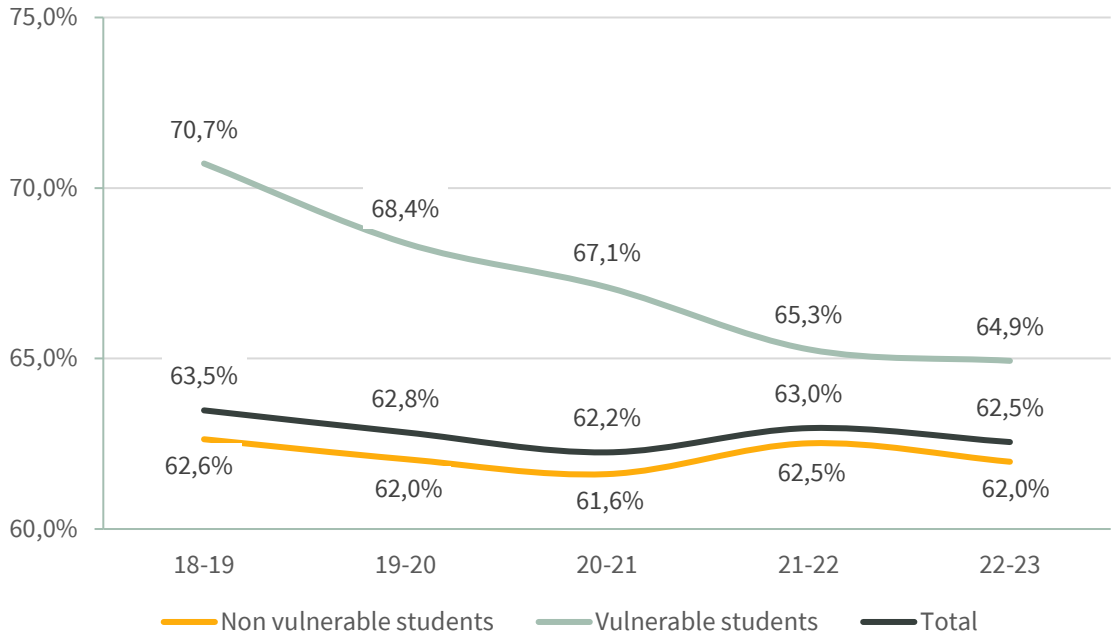
Table 2. Details of the difference in SCA retention in the SCA affected by Comprehensive School Transformations before and after the transformations. Students in the 1st year of pre-school education and 1st year of Compulsory Secondary Education

		School catchment area Retention - Pre-Transformation			School catchment area Retention 2022-23			Difference pre-post transformation		
SCA	Pre-transformation school year	Pre-school education	Compulsory Secondary Education	Total	Pre-school education	Compulsory secondary education	Total	Pre-school education	Compulsory secondary education	Total
SCA06	2017-18*	86.5%	72.8%	79.0%	84.0%	71.5%	77.2%	-2.5%	-1.3%	-1.8%
SCA07	2019-20	68.6%	59.0%	63.8%	61.8%	63.4%	62.7%	-6.8%	4.4%	-1.1%
SCA15	2019-20	79.9%	46.7%	63.3%	74.0%	49.5%	59.0%	-5.9%	2.8%	-4.3%
SCA18	2017-18*	73.0%	70.6%	71.8%	70.3%	68.8%	69.5%	-2.7%	-1.8%	-2.3%
SCA19	2017-18*	68.4%	64.6%	66.6%	63.0%	56.7%	59.7%	-5.5%	-7.9%	-7.0%
SCA21	2019-20	93.5%	85.4%	90.0%	90.0%	88.7%	89.3%	-3.5%	3.3%	-0.7%
SCA22	2017-18*	79.1%	91.6%	84.8%	69.1%	82.1%	75.5%	-10.1%	-9.5%	-9.2%

*Notes: Data for 2017-18 not available, data for 2018-19 are used.

Source: Own elaboration based on enrolling data provided by the Barcelona Education Consortium.

Figure 4. Proportion of Barcelona students in their 1st year of pre-school and 1st year of compulsory secondary education who attend schools in the same SCA as their residence (2018-2022)



Source: Own elaboration based on enrolling data and data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

The analysis of retention disaggregated by vulnerability status revealed significant within-catchment-area disparities in two cases. In SCA19, vulnerable students were 10.4 percentage points less likely than their non-vulnerable peers to enrol in schools within their own SCA. In SCA15, the gap was even more pronounced: 78% of vulnerable students remained in the SCA, compared to only 50% of non-vulnerable students—a difference of 27.7 points. This pattern of differentiated behaviour had already been observed before the transformations (with a 26.1-point gap), suggesting that the interventions have not reversed these pre-existing dynamics. The persistence of these gaps is documented in Table 3 and visualised in Figure 5.

In terms of school demand, the evolution across transformed schools was heterogeneous, but aggregated data point to a convergence between transformed schools and other public schools in the same SCA. Over the last three academic years, transformed schools registered demand levels ranging from 95% to 103% of available school places, closely aligning with the city average for public schools. This convergence indicates an improved positioning of transformed schools within the local educational offer, though it conceals notable variation across SCA and specific schools. This trend is shown in Figure 6 and Figure 7.

Table 3: Retention within SCA affected by Comprehensive School Transformations. Disaggregated by vulnerability. Comparison of results before and after transformation

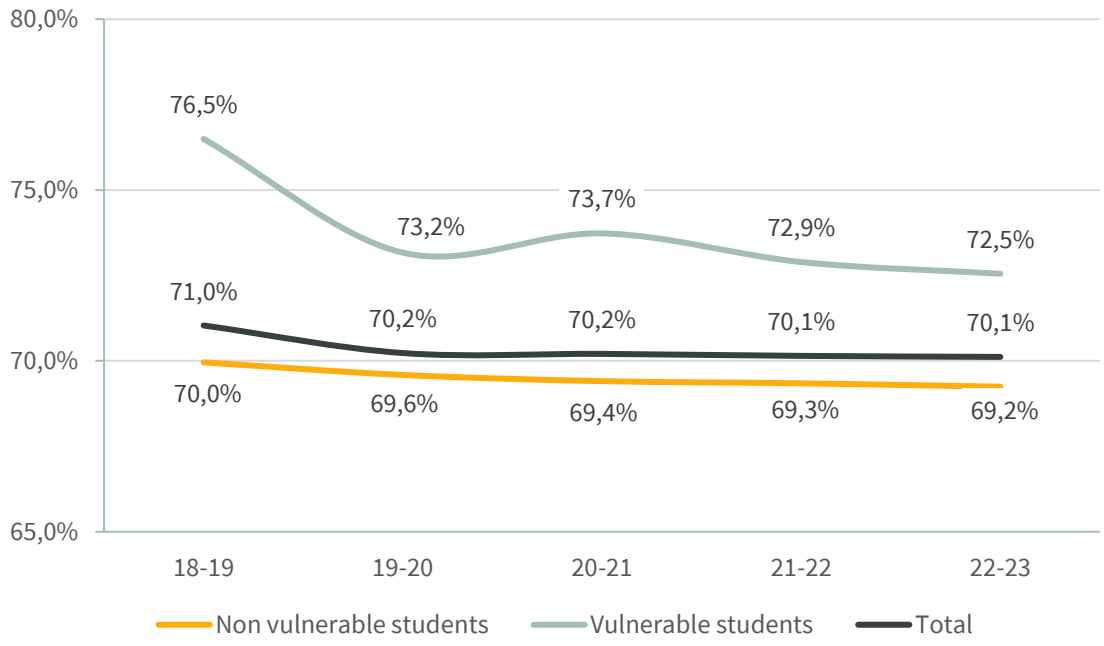
		School catchment area Retention - Pre-Transformation			School catchment area Retention 2022-23			Difference between Vulnerable and Non-vulnerable Students (1)		
SCA	Pre-transformation school year	No vuln.	Vuln.	Total	No vuln.	Vuln.	Total	Pre-transf.	2022-23	Difference
SCA06	2017-18*	79.4%	75.2%	79.0%	77.6%	76.0%	77.2%	-4.2	-1.6	-2.6
SCA07	2019-20	64.0%	58.5%	63.8%	62.3%	67.1%	62.7%	-5.4	4.8	-0.7
SCA15	2019-20	51.7%	77.8%	56.6%	50.2%	77.9%	59.0%	26.1	27.7	1.5
SCA18	2017-18*	72.2%	71.0%	71.8%	69.2%	69.9%	69.5%	-1.3	0.7	-0.6
SCA19	2017-18*	68.8%	59.0%	66.6%	63.5%	53.2%	59.4%	-9.8	-10.4	0.6
SCA21	2019-20	93.8%	84.8%	90.5%	89.1%	89.6%	89.3%	-9.0	0.5	-8.5
SCA22	2017-18*	84.2%	85.7%	84.8%	74.3%	77.2%	75.5%	1.5	2.9	1.4

Notes: * Data for 2017-18 not available, data for 2018-19 are used.

(1) These values express the magnitude of the difference in behaviour between vulnerable and non-vulnerable students. The number indicates the size of the difference, and the sign indicates the direction. Positive values imply that the school catchment area has better retention of vulnerable students than non-vulnerable students (i.e., they remain in education at a higher rate), while negative values imply the opposite.

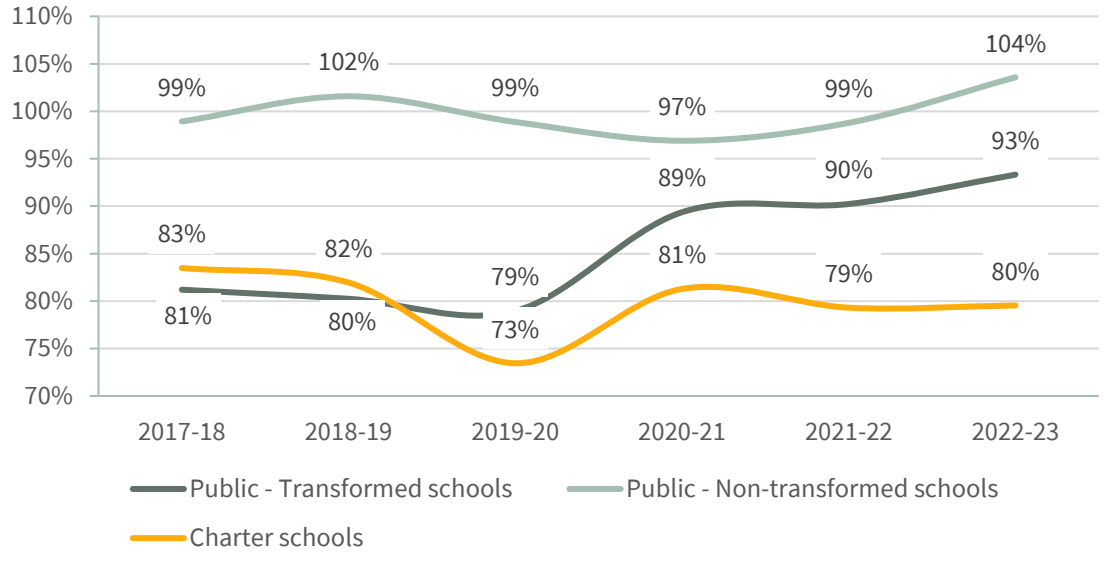
Source: Own elaboration based on enrolling data provided by the Barcelona Education Consortium.

Figure 5. Proportion of students in their 1st year of pre-school and 1st year of compulsory secondary education in the SCA affected by transformations who attend schools in the same SCA as their residence. Disaggregated by degree of vulnerability. 2018-2022



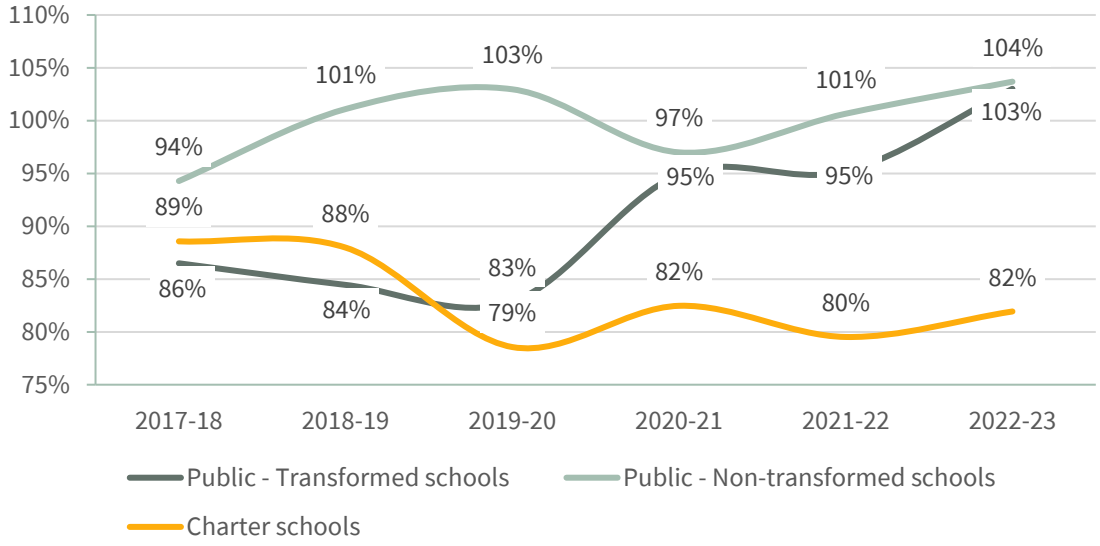
Source: Own elaboration based on enrolling data and data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

Figure 6. Evolution of the school demand in Barcelona for the 1st year of pre-school education



Source: Own elaboration based on enrolling data and data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

Figure 7. Evolution of the school demand in the SCA with Comprehensive School Transformations for the 1st year of pre-school education



Source: Own elaboration based on enrolling data and data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

Even though public non-transformed schools also perform better in attracting higher demand than charter schools in the affected SCAs, the increase in demand for transformed schools is almost twice as large. While charter school demand in affected SCAs for the 1st year of pre-school education declined slightly (-7% in relative terms), demand in public non-transformed schools increased by around 10% and demand in transformed public schools increased, on average, by 19%. To assess whether these differences are statistically significant, we estimate a school-level regression model controlling for baseline demand in the first school year of the series (2017–18). The regression specification is:

$$Var_{2017-2022,i} = \beta_0 + \beta_1 NonTransformedPS_i + \beta_2 TransformedPS_i + \beta_3 Demand_{2017-18,i} + \varepsilon_i$$

where the dependent variable $Var_{2017-2022,i}$ denotes the variation in school demand for the 1st year of pre-school education between school years 2017–18 and 2022–23 for school i. $NonTransformedPS_i$ is a dummy variable that takes value 1 if the school is a non-transformed public school and 0 otherwise, while $TransformedPS_i$ is a dummy variable that takes value 1 if the school is a transformed public school and 0 otherwise. $Demand_{2017-18,i}$ controls for the school's demand level in the initial year of the series. The model is estimated at the school level, with each school constituting one observation. Charter schools serve as the reference category against which the coefficients for non-transformed and transformed public schools are interpreted. The estimation sample includes 60 schools: 27 charter schools, 25 non-transformed public schools, and 8 transformed public schools.

As shown in Table 4, after controlling for baseline demand, transformed public schools show a statistically significant higher increase in demand than charter schools. Non-transformed public schools also show a statistically significant increase relative to charter schools, although the estimated effect is smaller than that observed for transformed public schools.

A further limitation concerns the size and composition of the estimation sample. The overall sample includes 60 schools, which is modest in absolute terms and limits the statistical power and precision of the estimated coefficients. This limitation does not only affect the coefficient for transformed public schools but applies to all estimates reported in Table 4. In addition, the treated group is particularly small, comprising only 8 transformed public schools. As a result, the estimated coefficient for this group may be especially sensitive to individual cases, since one or two atypical schools could meaningfully affect the magnitude of the estimate. For these reasons, the results should be interpreted with caution.

Schools are grouped into a limited number of school catchment areas (SCAs) in the estimation sample, with only seven clusters observed. While clustering standard errors at the SCA level is conceptually appropriate given that schools within the same catchment area may be exposed to common shocks and shared demand dynamics, the small number of clusters constrains the reliability of cluster-robust inference. In addition, the distribution of school types across SCAs is uneven, with some categories not represented in all catchment areas, which further limits the precision of cluster-based adjustments. These considerations further reinforce the need not to overemphasise statistical significance.

Table 4. Estimated effects on school demand variation in the SCAs with Comprehensive School Transformations for the 1st year of pre-school education between the school years 2017-18 and 2022-23, controlling for the demand level in the initial year

	Estimate	Std. Error	t value	Pr (>|t|)
(intercept)	0.33668	0.13628	2.470	0.01668 **
Type of school: Non-Transformed Public School	0.18057	0.07814	2.311	0.02469 **
Type of school: Transformed Public School	0.37642	0.11232	3.351	0.00147 ***
Demand level in 2017-18	-0.44888	0.13812	-3.250	0.00199 ***
Significance codes: *** p < 0.01, ** p < 0.05, * p < 0.10.				
Multiple R-squared: 0.3123 Adjusted R-squared: 0.274				

Notes: Sample: 60 schools (27 charter schools, 25 non-transformed public schools, and 8 transformed public schools).
Source: Own elaboration based on enrolling data and data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

Regarding the sustainability of changes, medium- and long-term consolidation appears to depend on three conditions. First, financial and programmatic continuity, given that several mechanisms supporting the transformations rely on complementary initiatives such as Pla de Barris and PMOE, and on the maintenance of high-complexity related resources. Second, organisational stability, particularly teacher retention and staffing conditions, as turnover remains high and undermines the institutionalisation of pedagogical changes. Third, social legitimacy and community anchoring, since governance perceptions and family engagement shape whether changes are appropriated and sustained beyond the implementation phase.

Organisationally, one of the most recurrent challenges identified by school management teams was the high level of teacher mobility. According to the results from the survey, transformed schools experienced, on average, 30 % of staff changes per year. Despite policy measures designed to increase stability—such as teacher selection in newly created schools and the application of the Staffing Decree—mobility remains high. Nevertheless, approximately 80% of

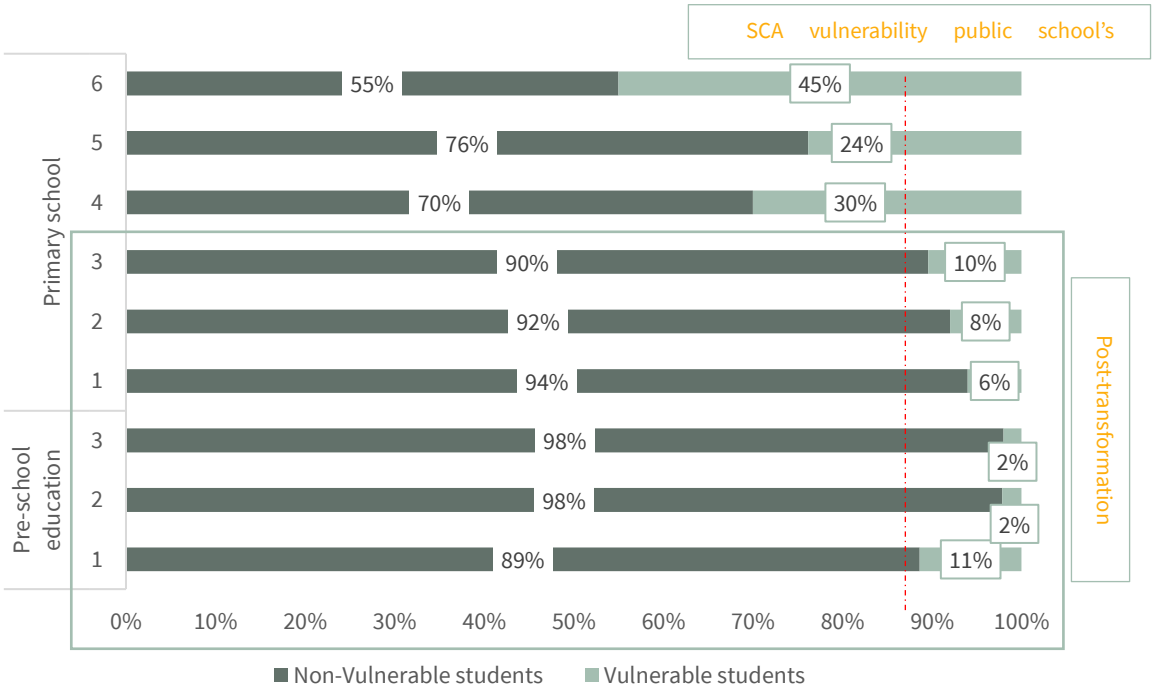
teaching staff remained in place during the first year after transformation, suggesting partial success in staff retention. Structural factors, such as the predominance of temporary employment and assignment mechanisms based on seniority rather than alignment with educational projects, continue to hinder the consolidation of stable teaching teams. This issue is especially acute in compulsory secondary education in IEs, where the lack of incentives and less favourable working conditions (e.g. afternoon schedules) exacerbate staff turnover.

Regarding family engagement, most headmasters reported a perceived increase in participation following the transformation. This involvement manifested in areas such as joint activity planning, participation in shared committees, and collaborative maintenance of school spaces. However, this increase did not translate into higher membership in Family Associations (AFAs), which remained largely stable. According to headmasters, the composition of AFAs still fails to reflect the diversity of the student body, with only 10% of participating members being men. Language and cultural differences were commonly cited as barriers to wider participation, along with the presence of families from pre-merger schools who felt disconnected from the new educational projects and chose not to engage.

Two unintended effects were noted during the fieldwork. First, in merged schools, some families found themselves in educational settings that they had not actively chosen and expressed discomfort with the new pedagogical orientations. These families, often a minority, felt distanced from decision-making spaces and reported lower participation, particularly in AFAs. Second, in certain SCA, the creation of newly transformed schools generated a "pull effect" that initially concentrated demand but subsequently led to a drop in enrolments at neighbouring schools. In some cases, this dynamic risked creating conditions of “segregation from above,” whereby the socio-cultural profile of the school became decoupled from that of the surrounding community due to increased enrolment by higher-income or non-local families. Figure 8 presents an illustrative example of this pattern in one transformed school. In the post-transformation cohorts, the vulnerability profile of entrants falls below the average vulnerability level of public schools in the same SCA. Although this does not constitute a systematic estimate, it illustrates how increased school attractiveness may, in some cases, be associated with a more advantaged intake than the local context would predict.

Finally, in a small number of SCAs, the transformation process coincided with the reduction or disappearance of post-compulsory education programmes, either within the transformed school itself or across the entire SCA. This reduction in educational continuity options may limit future opportunities for students and should be considered when planning long-term transformation strategies.

Figure 8. Example of a cohort composition of a transformed school where segregation from above appeared



Source: Own elaboration based on data from the Student Register of Catalonia (RALC) provided by the Barcelona Education Consortium.

7. Discussion and Conclusions

The Comprehensive School Transformations carried out in Barcelona between 2018 and 2023 represent a notable attempt to address school segregation through a systemic and multidimensional policy. Rather than focusing solely on regulating family choice or redistributing vulnerable students, the policy aimed to reconfigure the real and perceived quality of public education, particularly in under-demanded schools located in high-vulnerability SCAs. This evaluation confirms that the transformations were largely implemented according to plan and that, in most cases, they led to a reduction in school segregation and a shift in family demand towards the renovated schools. These findings are consistent with the hypothesis that improving school quality—both pedagogical and infrastructural—can alter the school selection logic of middle-class families, who have often been identified as key agents in the reproduction of segregation (Boterman, 2013; Cordini, 2019). As Bonal and Zancajo (2020) have argued, segregation in liberal school systems stems not only from allocation mechanisms but from symbolic hierarchies between schools. By targeting the symbolic and material status of disadvantaged schools, the CEB sought to reconfigure the educational landscape towards a model of territorial equivalence, in which all schools are seen as viable and desirable by all families regardless of background.

The transformations generated observable improvements, particularly in SCA where interventions were most comprehensive. Dissimilarity indices decreased, in some cases substantially, and schools reported increased demand. At the same time, the evaluation also uncovered risks and tensions. In several cases, schools that became highly demanded began to diverge socioeconomically from the surrounding area, giving rise to new dynamics of "segregation from above" (Bonal, 2018). This outcome is linked to the challenge of endogenous sorting (family self-selection), where more advantaged families selectively respond to perceived quality improvements, potentially leading to new forms of

stratification. This suggests that while comprehensive transformations can improve equity, they may also reproduce new forms of inequality if not accompanied by systemic measures to preserve internal diversity and avoid elite capture. These results resonate with OECD (2019) findings on the need to complement improvements in school quality with measures of controlled choice, such as admission quotas and greater transparency in enrolment processes.

The realist evaluation approach adopted in this study (Bhaskar, 2013; Louart et al., 2023) also allowed for the identification of key implementation mechanisms. The evaluation shows that changes were not automatic consequences of resource allocation but depended on how those resources interacted with local actors, institutional cultures, and organisational capacities. Stable leadership, coherent pedagogical direction, and collaborative staff cultures emerged as essential facilitators of successful transformations, whereas high staff turnover—particularly in secondary education—posed major barriers to sustaining change. These findings reinforce the notion that the success of public policy depends on how it is mediated by the behaviours, interpretations, and relationships of those involved in its implementation (Louart et al., 2023).

Although macro-level coordination between institutions was generally well regarded, the governance of the process at the school-level revealed important shortcomings. Many school communities perceived the transformations as imposed decisions rather than participatory processes. This top-down perception generated resistance and eroded trust, particularly in merged schools where the loss of previous institutional identities created tensions among families and teachers. These findings echo previous work on the importance of participatory governance in policy implementation (Purdon et al., 2001) and suggest that greater inclusiveness in the design and communication of transformations is essential to build legitimacy and shared ownership.

The evaluation also revealed that family participation in school life increased after the transformations, particularly in terms of informal involvement in activities and shared projects. However, this participation did not necessarily translate into more equitable governance structures. The composition of AFAs remained unbalanced, with underrepresentation of vulnerable families and a marked gender bias. In merged schools, former communities who felt alienated from the new educational project were less likely to engage, suggesting that institutional transformations must also attend to affective and identity dimensions.

While these findings are encouraging, several limitations must be acknowledged. The most significant methodological constraint is the lack of a formal quasi-experimental design, which restricts the identification strategy and prevents conclusive attribution of observed changes solely to the interventions. Second, the study's relatively short span of five academic years (2018–2023), combined with significant disruptions during 2020–2022 due to the COVID-19 pandemic, affected school functioning and introduced significant noise into indicators such as attendance, continuity in studies, and teacher stability. Third, microdata on academic performance were not available, limiting the analysis of learning outcomes and forcing the use of proxy indicators. Fourth, the improved detection of vulnerability over the period under analysis makes comparisons over time more complex, as this measurement artifact may artificially inflate trends, and it is unclear whether all changes reflect actual shifts or simply better measurement. Fifth, the qualitative sample may be somewhat biased toward participants who were involved in or benefited from the transformations, families who chose not to attend the transformed schools or who left the catchment area were not directly interviewed, which limits the understanding of persistent reputational issues. Finally, the presence of overlapping policies—such as Pla de Barris and the Shock Plan against School Segregation—introduces confounding factors that make it difficult to attribute observed effects solely to the transformations analysed.

Despite these constraints, the evaluation provides meaningful contributions to both practice and theory. It demonstrates that equity-oriented transformations can be effective when framed systemically and supported by sustained investment, institutional alignment, and inclusive governance. It also advances the theoretical understanding of desegregation policies by focusing on perception and demand-side dynamics rather than purely on distributional rules. Moreover, it highlights the relevance of realist approaches to education policy evaluation, which allow for a more nuanced account of how policies are enacted and experienced in practice (Louart et al., 2023).

Future research should explore the medium- and long-term effects of these transformations on student learning and trajectories, particularly for vulnerable groups, through the collection of longitudinal microdata on academic outcomes. Such data would make it possible to follow individual students over time and assess whether vulnerable students in transformed schools experience differential academic gains relative to comparable peers elsewhere. To enhance the methodological rigor and address the endogeneity issues inherent in school choice settings, subsequent studies should prioritize the adoption of quasi-experimental designs. Furthermore, research should include robustness checks (e.g., sensitivity analyses or placebo tests) and explore possible heterogeneous effects based on initial school composition to clarify the policy's full impact. Comparative studies could shed light on the transferability of this model to other urban contexts, while more in-depth qualitative work could further unpack how school communities experience and negotiate such major institutional changes. Ultimately, this evaluation underscores that reducing school segregation requires more than correcting enrolment procedures—it demands the construction of a public education system that is territorially coherent, pedagogically attractive, and socially legitimate for all families.

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Conflict of interests

The authors declare that they have no conflict of interest.

Author contributions

Laia Pi Ferrer: Conceptualization, Supervision, Qualitative analysis, Writing – original draft, Writing – review & editing.

Luis Fernández Sánchez: Conceptualization, Data curation, Quantitative analysis, Writing – review & editing.

Daniel Plata Cruz: Conceptualization, Qualitative analysis, Writing – review & editing

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