



Transition to post-compulsory education according to migrant background and gender in Catalonia: Exploring the effect of non-native student concentration

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The transition to post-compulsory education represents a fundamental educational decision that shapes young people's social and employment opportunities. However, these choices vary depending on social factors, such as socioeconomic background, immigrant origins, and gender, among others. The concentration of non-native students in schools may also influence these educational decisions, potentially disadvantaging students from lower social backgrounds. Using high-quality registration data from a cohort of students in their final year of compulsory education in Catalonia, Spain (N=82,923), this article analyses the probability of educational continuity -academic and vocational- or dropout, with special attention to the interaction between the immigrant background of the students and their gender. In addition, the impact of the concentration of non-native students in schools on students' educational decisions is analysed. The results reveal that non-native students, particularly boys, are less likely than their peers to follow more ambitious and higher-risk educational pathways. Conversely, native students are more likely to drop out of school, irrespective of their gender. When considering the level of non-native student concentration in schools, the findings suggest that variations in transition probabilities based on immigrant background decrease in environments with a more balanced composition.

1. Introduction

One of the most decisive decisions made by students and their families is which option to take at the end of compulsory education. In the case of Spain, this choice is usually between staying in the education system, pursuing either academic or vocational training, or leaving it. The importance of this decision lies in how it can condition both the students' educational trajectory and future employment opportunities. Selecting one trajectory or the other can limit the possibility of accessing future educational opportunities, leading to dead ends, and/or limit access to certain workplaces requiring a given level of qualification (Adalet & Andrews, 2015).

Moreover, these educational continuity decisions are not the same among all students if we consider their social characteristics. Socioeconomic status, gender and migrant background play key roles in students' educational trajectories and decisions (Dollmann, 2017; Hadjar & Scharf, 2019; Norton et al., 2019; Teese et al., 2011). It is important to consider the interaction among some of these factors. In Spain, different researchers point to the interaction between sex and immigrant background in transitions to post-compulsory education and the implications of educational continuity (Miret-Gamundi & Bayona-I-Carrasco, 2022). Specifically,

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the results conclude that male students and those of immigrant origin have the highest dropout rates and the lowest probability of continuing in education along academic tracks. The dropout rates are lower for immigrant females. However, but this group is overrepresented in professional tracks compared to native females (Termes, 2022).

Adding more complexity, these individual factors may vary if there are other explanations at the supra-individual level, such as the social characteristics of the school. For instance, the concentration of students with certain social characteristics in a school can have a differential impact among students depending on their individual characteristics. In the specific case of Spain, some research has explored the impact of the school concentration of certain social characteristics (ethnic background, social background and vulnerable population) on student achievement (Murillo et al., 2018; Murillo & Belavi, 2021) and students' educational continuity (Bayona-I-Carrasco et al., 2020; Elias & Daza, 2019; Tarabini & Curran, 2015).

These differences are particularly interesting in terms of social equity because the results of students in schools with a high concentration of working-class students or students with a migrant background show that there is a particularly detrimental effect on students from lower social backgrounds. To this effect, the inequality in educational opportunities for the most vulnerable groups can be further aggravated if we consider the characteristics in relation to the social composition of the secondary education schools the student attended. This double level of inequality highlights the need to deepen the analysis of different individual and school factors and how they interact in the impact on students' educational outcomes at the end of the compulsory stage. One of the vulnerable groups are immigrants, who come mostly from developing countries (Bonafé et al., 2021).

Although there are many studies that have analysed the relationship between school concentration and educational outcomes such as academic performance and educational trajectories, there are fewer that examine in depth how different levels of immigrant school concentration influence transitions to post-compulsory education. The contribution of this paper is to try to shed light on how different levels of immigrant school concentration influences transitions to post-compulsory education.

In the light of the above, the aim of this article is twofold. First, to explore the probabilities of students' educational continuity at the end of compulsory education, considering the interaction effect of students' immigrant background and sex. With this objective in mind, the probability of accessing the academic or the vocational track, or alternatively dropping out, is analysed. The second objective is to explore whether these probabilities of accessing one or the other option vary according to the level of concentration of non-native students in the school.

The paper is structured as follows. It first reviews the contributions of existing studies on educational trajectories at the end of compulsory education and provides an overview of the effect of segregation and school concentration. It then goes on to explain the Spanish education system and the methodology used to finalise the results. Last, the results that respond to the objectives set are presented, and the final conclusions and some policy recommendations are drawn.

2. Inequalities in transitions to post-compulsory education

2.1. The effect of immigrant background and sex on educational trajectories

Transitions to post-compulsory education are a fundamental process in explaining young people's choices in relation to their social class, gender, and ethnic and migrant background (Collins, 1971; Crompton, 2008). One of the most widely used analytical proposals to explain differences in educational achievement according to social origin is Boudon's (1974) distinction between primary and secondary effects. According to this proposal, primary effects refer to the difference in the academic performance of students according to their social origin. Thus, students from higher social backgrounds perform better due to more economic, social and/or cultural family resources. Secondary effects, on the other hand, refer to differences in the educational decision-making of students and their families, despite having the same academic performance. In other words, it relates to how students and their families from different social backgrounds assess the costs, probabilities of success, and expected returns of each educational alternative. As a result of this process, families from more privileged social backgrounds tend to make more ambitious and risk-taking educational decisions, despite achieving similar academic performance as their peers.

The empirical evidence from various international research studies confirms these trends. Specifically, the results show that with the same marks, students with more vulnerable backgrounds perceive a greater risk, underestimate their abilities, and make more conservative transitions (Hadjar & Scharf, 2019; Khattab, 2018). This translates into an unequal presence of students based on their social background in the various pathways of the education system.

In this regard, there is a wealth of literature that shows the bias of the professional track for young working-class people with poor performance in compulsory education, starting with the French pioneer sociologists Baudelot and Establet (1971). No matter how much the prestigious parity between the academic and vocational paths has been defended, the fact is that the link between vocational training and lower academic performance and academic failure for students of low social origin is maintained even in countries where vocational training is supposed to have greater social prestige, as is the case of Germany (Dollmann, 2017; Norton et al., 2019; Teese et al., 2011).

A remarkable volume of research has been carried out in Spain in recent years to analyse the educational choices of young people (Bernardi & Cebolla, 2014; Daza, Troiano, & Elias, 2019; Tarabini & Curran, 2015). Results show a majority tendency to choose the academic track. Specifically, it is observed that 95 % of students with at least one university-educated parent preferred to enrol in baccalaureate rather than in vocational education or to drop out (Valdés, 2022).

However, the results also highlight the existence of biases that specifically affect disadvantaged students such as those from poorer families and migrant families. For instance, students from migrant backgrounds are underrepresented in post-compulsory education due to higher rates of dropout (Merino et al., 2020; Termes, 2017), and are more present in vocational training with an

over-representation in certain subjects (Miret-Gamundi & Bayona-I-Carrasco, 2022) where the probability of employment is higher.

Different research at European level shows similar findings, that immigrants are subject to inequalities, particularly in the stratification of education and the construction of trajectories. On average, immigrant students achieve lower academic results than non-immigrant students and they are more likely to take vocational courses (Dollmann, 2017; Teese et al., 2011). To comprehend these differences, various proposals have adapted Boudon's framework and delved deeper into the primary and secondary effects of migratory origin on educational achievement (Dollmann, 2017; Jackson, 2012; van de Werfhorst & van Tubergen, 2007). The findings indicate that, even when accounting for the effects of social origin, disparities in students' school performance by ethnic origin are observed. Some authors have attributed these disparities to factors such as "cultural dissonance," associated, for example, with a lack of cultural capital or a deficiency in language knowledge or fluency (Heath & Brinbaum, 2007).

Furthermore, regarding secondary effects, differences are also observed in how students and their families make educational decisions based on their origin. It is worth noting that empirical studies on ethnic inequalities in educational transitions are not entirely conclusive. On one hand, some evidence suggests that parental lack of information and knowledge of the educational system may also play a fundamental role. Specifically, it is observed that immigrant parents do not have enough knowledge to give their children advice and prepare them for their future, so it becomes difficult for the offspring to think big (Conger, 2015), and it is even harder for them to imagine studying academically (Borgen, 2023b; Rimkute et al., 2012).

As far as vocational training is concerned, in countries where it is considered a pathway of excellence (Germany, Austria, Denmark), immigrants are under-represented compared to native-born students, and if they do choose this pathway, they have a high percentage chance of leaving prematurely without the qualification. Conversely, in countries where the vocational stream has a poor reputation, such as Belgium and Spain, immigrants are over-represented. In both systems, immigrants lose out (Sensi, 2018).

On the other hand, other findings reveal positive secondary effects of ethnic origin, indicating that non-native students are more likely to make riskier and more ambitious choices than their peers after controlling for performance. Consequently, non-native students are more likely to opt for an academic path rather than a vocational track. This phenomenon is attributed to what some authors have termed the "optimism hypothesis" or the "immigrant paradox" (Borgen, 2023b; Suárez-Orozco et al., 2009). This paradox would suggest that some minorities, given their awareness of their relatively disadvantaged position in society, understand that to reverse this situation they need to ensure the educational success of the next generation. Some authors rely on this paradox to explain the different behaviour of immigrants, although others argue that it has been overstated in several studies (Khattab, 2018).

In the specific case of gender influence, there are also differences relating to educational choices in post-secondary education. There are more women in academic tracks that go to university and there is an overrepresentation of men both on vocational courses and in terms of dropout, as a comparative international study shows (Vincent-Lancrin, 2008). Interpretations relating to gender inequalities help to understand these differences. Girls are becoming aware of the greater difficulties they will encounter in the labour market, regardless of the country, because of gender inequalities. Last, in a study based on an international comparison, it was found that although women are increasingly taking their place in the labour market, they are still encountering difficulties. To confront this unequal situation, women go through a process similar to that of the immigrant paradox, building up higher expectations for their future than do boys (Baird et al., 2008; Buchmann & Dalton, 2002).

Despite the persistent gender inequalities in the labour market, women are more encouraged to devote themselves to their education, in the knowledge that this is a way of claiming an independent future and breaking with traditional notions of dependence on a man (Rayle et al., 2005). To this effect, they realise that they must study for a long time to break down the barriers, as "glass ceiling" (Laufer, 2005), gender stereotypes, professional obligations that conflict with family obligations, or the absence of female role models and the fact that women lack self-confidence (Michailidis et al., 2012), preventing them to reach a good labour position.

Men are more likely to do vocational training because it is already highly male-dominated, with more prestigious male branches that result in increased job opportunities in comparison to the vocational training courses where there is a greater presence of women (Colley et al., 2003; Obiol-Francés et al., 2022; Termes, 2020). As far as drop-out is concerned, it is by nature associated with men, especially in the media. In this regard, men are under pressure to succeed, and for fear of not succeeding they give up before they do so (Tanggaard, 2013). They often drop out of education to work and provide for their families as quickly as possible (Rumberger, 1983), either because they do not like school, or because they have disruptive behaviour and are expelled, the school having insufficient resources to provide support for these students (Jordan et al., 1996). The general trend is the same in Spain, where boys choose the vocational pathway in a greater proportion, and girls with higher expectations choose the academic track (Elias, Merino, & Sánchez-Gelabert, 2020; Termes, 2022).

While the evidence seen so far demonstrates clear patterns between gender and migratory origin in educational inequality, it is essential to consider that these axes of inequality can interact and act in an additive manner. In this regard, it is necessary to incorporate an intersectionality perspective on educational inequalities (Gross et al., 2016) to consider the interactive effects between migrant origin and gender that evidence differential educational decision-making logics, transitions and educational outcomes.

Several studies conducted in various European countries highlight these disparities and conclude that, in general, being male, having a migrant background, and having a low socioeconomic status have a strong negative impact on educational outcomes (Gross et al., 2016). It is worth mentioning that differences in educational outcomes often also depend on the migratory background of the students. Specifically, a research study in Switzerland concluded that girls from the former Yugoslavia and Turkey are less likely to study than those from Italy (Hupka-Brunner & Stalder, 2011). Other research in France shows that girls from the Maghreb are more likely to end up unemployed or inactive because they combine social inequalities of origin and gender (Brinbaum & Guégnard, 2012).

Other research conducted in various international contexts concludes that gender differences in the continuation of compulsory schooling are modest and do not differ significantly among ethnic groups (Fleischmann et al., 2014). However, they do reveal significant variation in educational continuity based on ethnic origin. These results highlight the combination of a female advantage with

ethnic penalties.

Similarly, in the Spanish case, several studies have analysed the transition to post-compulsory education of a cohort of students in the last year of compulsory education. The results conclude that non-native and male students are more likely to opt for vocational training (Miret-Gamundi & Bayona-I-Carrasco, 2022; Tarabini et al., 2022).

This body of evidence can be amplified if we introduce other factors relating to the social composition of the neighbourhoods where the students live or where their schools are located. With the aim of deepening this evidence base, the following section presents different empirical results and possible explanations for these differences.

2.2. The effect of school segregation and concentration on post-compulsory transition

One of the institutional aspects that has an impact on educational outcomes such as marks and educational transitions is the social composition of schools. Family economic resources, parental educational level and immigrant origin are some of the indicators that have been used in research to define school segregation and to analyse the effect on educational results (Lamb & Fullarton, 2002; Sciffer et al., 2022). There is clear evidence from different countries of school segregation and its effect on educational outcomes.

Migrant concentration and segregation are social phenomenon whereby migrants cluster in specific areas of a city or region, often forming homogenous communities separated from the local population. This peculiarity can occur for a variety of reasons, such as the need to be close to other immigrants who speak the same language, share a similar culture or have the same religion. It may also be the result of socio-economic factors, such as the search for more affordable housing in urban areas where other immigrants are concentrated (Aparicio & Portes, 2021).

Taking the percentage of students of foreign origin as an indicator, the consequences of concentration on academic results has also been analysed in depth. The research has given somewhat mixed answers. Some studies have found a positive association between the proportion of migrants and the performance of both ethnic majority and migrant students (Borgen, 2023b; Konan et al., 2010). However, other studies have found either no effect (Cebolla-Boado & Garrido Medina, 2010; Hardoy et al., 2018) or even negative effects (Mok et al., 2016; Stanat & Christensen, 2006) of higher proportions of migrants in the classroom or in the school on all students' performance.

One of the most widely used explanations to understand these academic differences in the effect of segregation on academic outcomes is the peer effect (Borgen, 2023a; Sacerdote, 2011). According to this effect, the significant others, in Berger and Luckmann's (1966) words, are determinants for the construction of an individual's identity and expectations, also in relation to educational expectations. To this effect, students are generally influenced by the success of their peers, and this can promote a learning culture (Goldsmith, 2011; Legewie & DiPrete, 2012).

Notably, other research warns of the importance of considering the percentage of non-native students to delve deeper into the effects that concentration may have in educational terms. For example, a study in the Norwegian context explores the validity of the peer effect in educational environments with a high presence of immigrant population or immigrant-dense schools. The results suggest that in schools with a high concentration of immigrant students, the peer effect may have a negative influence (Borgen, 2023a). Similarly, other research concludes that the percentage of concentration has a negative impact on non-native students, but no negative effects on native students (Brunello & Rocco, 2013; Ohinata & van Ours, 2021). Specifically, at high levels of concentration of immigrants (over 40 %–50 %) all students have a worse performance, be they natives or immigrants (Dronkers & Van Der Velden, 2013; Jensen & Rasmussen, 2011), while overall marks could be better because of the teaching grading bias (Borgen, 2023b).

These results relating to poorer learning can be framed in what has been called the congestion effect (Lazear, 2001). According to this mechanism, the greater difficulties in the teaching-learning process in environments with a high percentage of immigrant students may have consequences for their performance and, consequently, for their transitions to post-compulsory education. Greater language difficulties (Espenshade & Fu, 1997), more disciplining and less teaching (de Bruyn et al., 2003; McCoach & Siegle, 2001), a reduction in the quality of the school (Jennings et al., 2015) and less time spent on the information given for guidance in the various courses of study (Gándara et al., 2003) promote teaching being less effective in this type of schools, as there is a poor effect of educating disadvantaged people and minorities (Peske & Haycock, 2006). In the same line, teachers' beliefs play a crucial role in explaining the composition of the vocational tracks, helping to understand why they tend to be over-represented by young people of a low socio-economic and cultural status, and of migrant and/or ethnic-minority origin (Boone & van Houtte, 2013; Tarabini et al., 2022).

The research in Spain concludes the mainly negative effects of school segregation and concentration (Bayona-I-Carrasco et al., 2020; Cebolla-Boado & Garrido Medina, 2010; Murillo & Belavi, 2021). The results of these studies show divergences in academic results and transitions to post-compulsory education according to the level of concentration of immigrants, highlighting that the higher the concentration the greater the school failure, due to a composition effect of the student body. However, among immigrant students, concentration is only negative at very high levels (Domingo & Bayona-I-Carrasco, 2019). A later study analysing the levels of territorial segregation concluded that there is a clear negative effect for native students on school failure due to the high concentration of immigrant population (Bayona-i-Carrasco & Domingo, 2021).

It is important to consider that immigrants generally go to socio-economically disadvantaged schools (Jean et al., 2007) where there are also disadvantaged native-born pupils. To this effect, it is often difficult to differentiate the effect of concentration by socio-economic origin and migrant origin. Recent research in the Spanish context sheds light on this issue. Specifically, it analyses the consequences of the effect of school segregation at the socio-economic level and according to the concentration of immigrant students on academic achievement in mathematics, language and science (Murillo & Belavi, 2021). The results confirm that socio-economic and immigrant-related segregation have a different impact on students' academic achievement. While socio-economic segregation negatively affects both groups in all three subjects, immigrant-related segregation has a greater weight on non-native students.

These results highlight the need to delve deeper into the impact of different concentration levels of non-native students on academic outcomes. Specifically, it is necessary to delve deeper into how different concentration scenarios may differentially impact the probabilities of continuing to post-compulsory studies, and which pathway to pursue -the vocational or the academic one.

Given that, as we have seen, the probabilities of transition differ according to the interaction of immigrant population and gender, it is especially important to delve deeper into how different concentration scenarios can contribute to improving the probabilities of educational continuity among the most disadvantaged groups. The interaction between gender and migrant origin shows how on average girls have higher achievement compared to boys because of estimated gender peer effects, this effect seems to be driven primarily by the impact of peers' achievement levels (Borgen et al., 2023).

3. Spanish education system

In the Spanish education system, after compulsory education (fourth year of ESO) students can choose between lower vocational training, baccalaureate or dropping out.¹ The theoretical age of finishing ESO is 15 years old, but there is a percentage of students that repeat a year during primary (2.5 %) and/or secondary school and finished ESO (9 %) at 16, 17 or even 18 years old (Ministerio Educación y Formación Profesional, 2022). While the Spanish curriculum is comprehensive until upper secondary, de facto ability grouping and the establishment of different educational pathways often occur by the tenth grade (Tarabini et al., 2018). Spain's educational system is an example of the *uniform integration model* commonly found in Southern European countries, characterized by rigid ability grouping in lower secondary education, resulting in high repetition rates and elevated levels of non-completion.

Another characteristic of the Spanish education system is that there are state, private and state-subsidised private schools (*concertadas*). Their unequal distribution across the territory is related to urban segregation dynamics and municipal policies. In terms of segregation processes, the basic split is between public (53 %) and private (47 %) schools (including state-subsidised), although this varies according to the territory (Ministerio Educación y Formación Profesional, 2023). Spain occupies a position slightly above the average among OECD countries on measurements of school segregation in terms of economically disadvantaged students (OECD, 2019), but not in terms of students of immigrant origin, where Spain is notably below the average (Ferrer & Gortazar, 2021).

These differences are accentuated by the stratification of the education system itself. From the earliest years of compulsory secondary education, students are placed in different streams and are guided by their marks rather than their preferences. Therefore, the general tendency is to recommend that students with the best marks follow the academic track, and those for whom this is not the case the vocational track (Tarabini et al., 2022).

3.1. Methodology

3.1.1. Objectives and hypothesis

The aim of the article is twofold. The first objective is to analyse the effect of the interaction of immigrant background and gender on students' transition to post-compulsory education. The second objective is to analyse whether there are differences in the interaction of immigrant background and gender according to different scenarios relating to the concentration of immigrant students in the school. With these objectives in mind and based on the empirical evidence presented above, several hypotheses are formulated:

Hypothesis 1. Sex and immigrant background interact in a way that has an influence on educational decisions in the transition to post-compulsory education.

- H1.1: Native students are more likely to make ambitious and riskier educational decisions and pursue academic tracks.
- H1.2: Female students are more inclined to make ambitious and riskier educational decisions and pursue academic tracks.
- H1.3: Female native students will be the group with a higher likelihood of pursuing an academic track.
- H1.4: Male non-native students will be the group with a higher probability of educational dropout.

Hypothesis 2. The level of concentration of non-native students in schools differentially affects students' educational decisions in the transition to post-compulsory education according to their migrant background.

- H2.1: In schools with a low concentration of non-native students, the transition probabilities to post-compulsory education will show greater disparities between native and non-native students.
- H2.2: In schools with a high concentration of non-native students, the transition probabilities to post-compulsory education will be more similar between native and non-native students.

3.1.2. Analytical strategy

Given that the outcome variable had three values –dropout, vocational trajectory and academic trajectory – a multinomial logistic model was applied to estimate the effects of sex and migrant background on educational transitions. The logistic regression introduced

¹ It should be borne in mind that students' possible choices are strongly conditioned by social and academic constraints. In the case of school dropout, in most cases it is not a choice, since without a secondary school leaving certificate it is not possible to continue studying.

the interaction between sex and migrant background, in addition to a number of control variables. We used individual control variables such as performance, controlling the bias of self-assessment of academic performance, and school variables such as school ownership (private/public); percentage of students with special needs at the school; and whether the environment was rural or urban in terms of the diversity of the offer of vocation training courses. Secondly, the same analyses were conducted while distinguishing between three scenarios in relation to the concentration of non-native students in the school: Low concentration (0–15 % non-native students), Medium concentration (16–30 % non-native students), and High concentration (+31 % non-native students). This allows us to compare the effects of sex and migrant background on educational transitions based on the school's composition in terms of non-native students. We followed the procedure recommended by Mize (2019) to estimate, interpret and present the nonlinear interaction effects. To this end, we plotted the predictions to determine the nature of the subjacent interactive effect, and to calculate the marginal effects to determine their size and significance.

3.2. Data

The data used for this article are based on registration data for all students in a cohort who were in the 4th year of ESO (the last year of compulsory education, equivalent to year 10 in many countries) in the academic year 2019–2020 (first year) and were therefore around 15 years old (about 10 % were a year older because they had repeated a year). Data are available for the same cohort for the next academic year 2020–2021 when they had to choose between continuing in post-compulsory education (academic or vocational track) or drop out.²

Data come from the official records of the Department of Education of the Government of Catalunya and include sociodemographic variables (sex, native and non-native students, students with special needs), educational variables (marks at the end of compulsory education, studies at the beginning and at the of the longitudinal analysis -t0 and t1) and school-related variables (ownership, public or private, and rural-urban environment).

3.3. Measures

3.3.1. Dependent variables

Post-compulsory educational transitions.³ Three main transitions were identified based on the courses of study the students enrolled in the year after completing compulsory education: academic ($n = 49,089$; 62,6 %), vocational ($n = 20,270$; $n = 25,9$ %), and drop-out⁴ ($n = 9000$; 11,5 %).

3.3.2. Independent variables: sex and migrant background

Migrant background: Based on students' nationality⁵: 1. Spanish native students ($n = 68,504$, 87,4 %) and non-Spanish native students⁶ ($n = 9855$; 12,6 %).

Sex: 1. Female ($n = 38,609$; 49,3 %), 2 = Male ($n = 39,750$, 50,7 %)

School immigrant concentration: Percentage of non-Spanish native students in each school. We divided the variable into three intervals, distinguishing three scenarios in relation to the concentration of non-native students in the school: Low concentration (0–15 % non-native students), Medium concentration (16–30 % non-native students), High concentration (+31 % non-native students)

² The data belongs to the Department of Education, the authors of the article have signed a confidentiality agreement with this institution. The microdata files provided have been subjected to statistical disclosure control techniques in order to avoid, as far as possible, the direct identification of the individual information subject to statistical confidentiality. In accordance with the terms established in articles 20 and 21 of Decree 143/2010 of 19 October, on the Register of Statistical Files and the cession of data subject to statistical confidentiality. Likewise, they are protected by Regulation (EU) 2016/679 of the European Parliament and of the Council, of 27 October 2016, on the protection of individuals with regard to the processing of personal data and the free movement of such data; the General Data Protection Regulation (RGPD); Organic Law 3/2018, of 5 December, on the protection of personal data and the guarantee of digital rights, and by the other applicable legislation in force in this area.

³ Those students who repeated ESO and, therefore, did not continue post-compulsory studies have been eliminated.

⁴ It is worth mentioning that 'dropout' refers to students who were enrolled in the academic year 2019-20 but did not re-enroll in the subsequent academic year, 2020-21. Since the analysed data corresponds to registration records for all students in educational institutions in Catalonia, instances of dropout may include situations that do not necessarily indicate educational dropout but rather to dropping out of the educational system. For instance, a small percentage of students may have relocated and continued their studies outside Catalan institutions.

⁵ The registration data only allow us to define the migrant background based on legal status, distinguishing between students of Spanish or foreign nationality.

⁶ In relation to the migratory origin of non-native students, a significant proportion (approximately two thirds) comes from three main regions: 27.8% have the nationality of African countries, 22.4% from South American countries and 16.8% from Asian countries.

3.3.3. Control variables

School ownership: Public ($n = 53.320$; 64.3 %) and Private ($n = 29.603$; 35,7 %)

SEN: Special educational needs requiring educational support. SEN students (17.948; 21.6 %) and non-SEN students (64.975; 78.4 %).

Rural-urban environment: Rural ($n = 2.876$; 3.5 %), Between urban and rural (7.016; 8.5 %), Urban (40.45; 48.8 %), Urban around Barcelona (32.574; 39.3 %).

Mark in compulsory education ESO (scale: 5–10; average: 6,51)

4. Results

4.1. Transition to post-compulsory education: the effect of sex and migrant background

The first objective of this article was to analyse whether, under equal conditions (performance, type of school, environment, SEN), the probability of students continuing studying after completing compulsory education varied according to sex and migrant background. The analyses of the interaction effect between migrant background and sex allowed us to show whether the impact of migrant background on the propensity to pursue one or another educational option (or drop out) differed between men and women.

To this effect, we could graphically compare (Fig. 1) the predicted probabilities of following one or the other trajectory and their relative importance for the students, according to the interaction of migratory origin and sex, as derived from the multinomial logistic model. First, the most common educational option at the end of compulsory education was to continue on the academic track - with a clear orientation towards university. The next most likely educational trajectory among the students was the vocational trajectory and, in last place, dropping out of school.

Even though the hierarchy of the three options was the same for all students, it is worth highlighting the differences in the specific importance of each option, according to the interaction of migrant origin and sex. Following the methodological proposal by Mize (2019), firstly, a test of first differences was performed to determine whether differences in migrant background by sex and the probability of moving to one or the other option were significant. Second, a test of second differences was performed to test whether two first differences were equal.

The results show (Table 1) that the non-native females had a significantly lower probability of staying on the academic pathway (0.546) than did the native females (0.691; $\Delta = 0.145$; $p < 0.05$). Similarly, the non-native male students had a significantly lower probability (0.518) than the native males (0.684; $\Delta = 0.166$; $p < 0.05$). The effect of migrant background—with non-native students being less likely to be in an academic track—was larger for the men than it was for the women (second difference 0,145 – 0,166 = –0.021; $p < 0.05$).

Source: own elaboration.

Second, we performed the same operation for pursuing vocational studies (Table 2). In this case, the probability was significantly higher for non-natives than for natives for both females ($\Delta = -0.082$; $p < 0.05$) and males ($\Delta = -0.072$; $p < 0.05$). As in the case of the probability of taking an academic pathway, significant differences were observed according to sex, with the effect being greater for boys than for girls (second difference –0.063 – 0.094 = 0.031; $p = 0.05$).

Last, the probability of dropping out of school at the end of compulsory education was analysed (Table 3). The results showed that the non-native females had a significantly higher probability of dropping out (0.140) than did the native females (0.058; $\Delta = -0.082$; $p < 0.05$). Similarly, the non-native males had a significantly higher probability of dropping out (0.121) than did the native males (0.049; $\Delta = -0.072$; $p < 0.05$). In contrast to the academic and vocational transitions, the effect of migrant background—with native students being less likely to drop out—showed no significant differences between women and men (second difference –0.082 – 0.072 = 0.009; $p = n.s.$). Therefore, we can conclude that the probability of dropping out was higher among students with a migrant background and the effect was similar among the boys and the girls.

Source: own elaboration.

If we revisit the hypotheses formulated, we observe that Hypothesis H1.1 is confirmed, indicating that native students are more likely to make ambitious and riskier educational decisions and pursue academic tracks. However, the results show that female students, in comparison to male (regardless of their migratory background), do not have a greater probability of following academic tracks, thus rejecting Hypothesis H1.2. In this context, when incorporating an intersectionality perspective, the results allow us to confirm that female native students are the group with a higher likelihood of pursuing an academic track (Hypothesis H1.3), but they also reveal that it is female non-native students, and not non-native males, who have a higher probability of educational dropout (Hypothesis H1.4).

These results raise some questions about educational equity in access to post-compulsory education for students with a migrant background. Another factor might influence educational equity is the effect of school segregation and the unequal distribution of students from working class and immigrant backgrounds in schools.

Following this approach, another objective was to explore whether there was a school effect -in terms of the concentration of the immigrant population- on the probability of following one or another path according to sex and immigrant origin. That is, whether the evidence varies according to the composition of the schools in terms of the concentration of non-native students. To test this

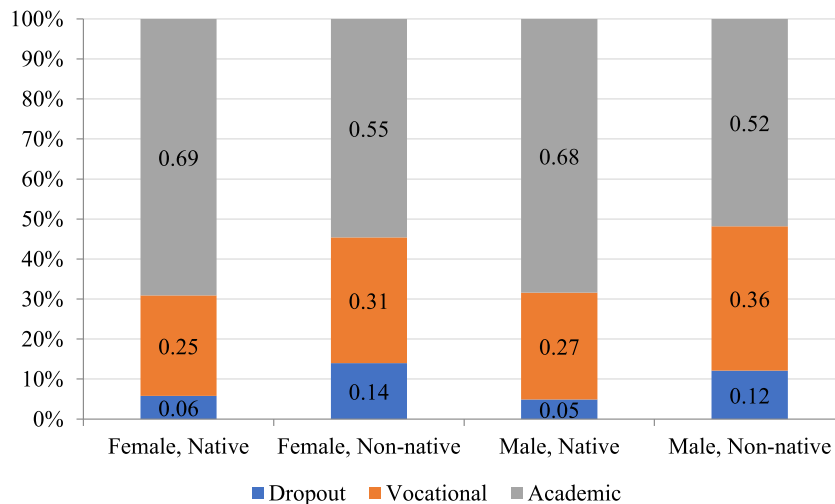


Fig. 1. Post-compulsory educational trajectories transition. Predicted probabilities by sex and migrant background.
Source: own elaboration.

Table 1

Probability of academic trajectory by sex and migrant background with test of interaction effect.

	Pr(Academic)	First differences	Second differences
Female, Native	0.691 (0.002)		
Female, Non-native	0.546 (0.007)	0.691 – 0.546 = 0.145**	
Male, Native	0.684 (0.002)		–0.021*
Male, Non-native	0.518 (0.007)	0.684 – 0.518 = 0.166**	

Standard errors of the predictions in brackets. ** $p < 0.01$, * $p < 0.05$, two-tailed tests.

Table 2

Probability of vocational training by sex and migrant background with test of interaction effect.

	Pr(Vocational)	First differences	Second differences
Female, Native	0.251 (0.002)		
Female, Non-native	0.314 (0.007)	0.251 – 0.314 = –0.063**	
Male, Native	0.267 (0.002)		0.031*
Male, Non-native	0.361 (0.007)	0.267 – 0.361 = –0.094**	

Standard errors of the predictions in parenthesis. ** $p < 0.01$, * $p < 0.05$, two-tailed tests.

Source: own elaboration.

hypothesis, separate analyses were carried out for schools with low, medium and high concentrations of non-native students. The results allowed us to compare the predicted probabilities of following one or another trajectory depending on whether the schools had a more or less balanced composition. By doing so, we will be able to refute the second hypothesis, which suggests the existence of an effect of the level of immigrant concentration in schools on educational transitions.

Table 3

Probability of dropout by sex and migrant background with test of interaction effect.

	Pr(Dropout)	First differences	Second differences
Female, Native	0.058 (0.001)		
Female, Non-native	0.140 (0.006)	0.058 – 0.140 = –0.082*	
Male, Native	0.049 (0.001)		–0.009
Male, Non-native	0.121 (0.005)	0.049 – 0.121 = –0.072*	

Standard errors of the predictions in parenthesis. ** $p < 0.01$, * $p < 0.05$, two-tailed tests.

4.2. School composition and educational transitions: the effect of school segregation of immigrant students

The second objective of the article was the comparison of the results in three scenarios, with low, medium and high concentrations of non-native students, enabling us to reach different conclusions on the effect of the educational context on students' educational transitions. To simplify the results and be able to compare them at a glance, all the results of the analyses of the three different contexts have been summarised in the graph below.⁷

First, a basic analysis of the results allowed us to analyse and compare the probabilities of dropping out or not (academic or vocational pathway) between foreign and native students in the different contexts. That is, if in the contexts with a certain concentration of immigrant students the probabilities varied in comparison with the other contexts.

If we focus on the case of academic transition after completing compulsory education (grey in the Fig. 2), and as we saw earlier, the probability was significantly higher in the case of native students regardless of gender and decreased in environments with a higher concentration of immigrant students. In the case of following a vocational trajectory (orange), a higher probability was observed among non-native students, again regardless of whether they were boys or girls. It was also evident that the probabilities increase in environments with a greater presence of similar students (environments with high concentration). Last, in relation to dropout (blue), it was found that the non-native students were significantly more likely to drop out of school than their native peers, regardless of sex. This probability increased as the concentration of non-native students in the school increased. This increase was especially significant in the case of native students, going from 0.05 (female) and 0.04 (male) in environments with a low concentration to 0.08 (female) and 0.09 (male) in contexts with a high concentration.

Second, and more interestingly, this analytical strategy allowed us to identify the educational contexts in which the differences in the probabilities of moving to one or another educational option were greater among students, according to the interaction of sex and migratory origin. It is in the contexts where the differences in the probabilities are lower that educational inequality is lower. It should be remembered that the analyses were carried out by introducing a series of control variables, among which was the performance obtained at the end of the compulsory stage. Therefore, the differences in the probabilities of transitioning to one or the other option were controlled by student performance.

To perform this analysis, we compared the differences in the probabilities of moving into each of the three options (academic, vocational and dropout), incorporating the interaction of sex and migrant origin in the three scenarios relating to non-native student concentration. Specifically, a first differences test was performed to assess whether the differences between the sex and migrant origin interaction were significant in each of the three scenarios. The results showed differential patterns according to levels of concentration of immigrant students in the school.

The scenarios that presented a greater difference in the probability of following an academic trajectory between native and non-native students were those with lower non-native concentration. This pattern, as shown in the table below, was the same for boys and girls, with the differences in the probabilities of transitioning to the academic track increasing by 14 % ($p < 0.01$) and 15.3 % ($p < 0.01$) in contexts with a low concentration of non-native population, for girls and boys respectively. This percentage was almost the same as in the high concentration scenario (6.3 % and 8.9 %, both $p < 0.01$) (Table 4).

In the case of vocational transitions, if we analyse the results considering the three different scenarios, it was evident that in the schools with a low presence of immigrant students, the differences were accentuated both for boys (-0.083 ($p < 0.01$) < -0.38 ($p < 0.05$)), and even more so for girls, where the differences in probabilities were not significant between native and non-native students (-0.062 ($p < 0.01$) < -0.004 (n.s.)) (Table 5).

Last, the results were analysed in the case of the probability of dropping out of school. As with the probability of continuing in the vocational track, it was evident that in contexts where the concentration of non-native students was greater (*High scenario*), the differences were lower for both the girls ($-0.059 < -0.079$ (both $p < 0.01$)) and the boys ($-0.051 < -0.070$ (both $p < 0.01$)) (Table 6).

Comparing these results with the hypotheses stated above confirms the existence of an effect of the concentration level of non-native students in schools on post-compulsory transitions (H2). Specifically, it was found that in schools with a lower presence of non-native students, the differences in the educational probabilities between native and non-native students were greater. This confirms Hypothesis H2.1, which proposed that in more segregated scenarios or with a more unequal presence of students according to

⁷ The differentiated results for each of the educational contexts are included in the annex.

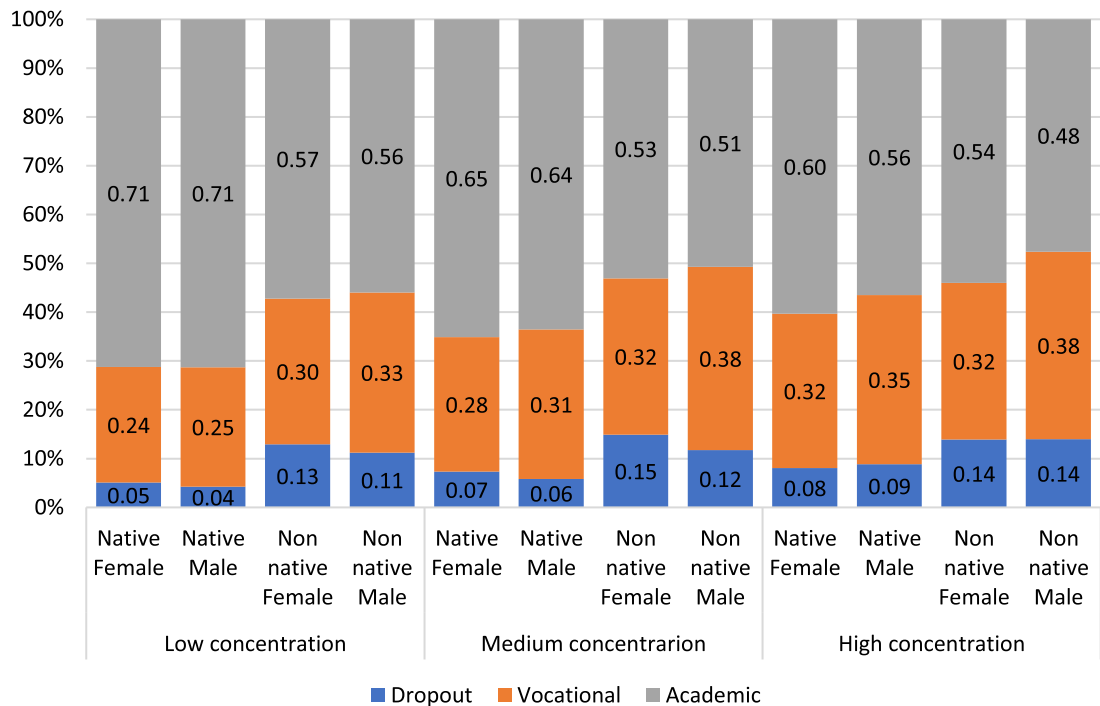


Fig. 2. Post-compulsory educational transition. Predicted probabilities by sex and migrant background and by non-native student concentration.

Table 4

Predicted probability of academic trajectory by sex and migrant background and by non-native student concentration with test of interaction effect.

	Academic trajectory		
	Low	Medium	High
Female, Native	−0.140**	−0.120**	−0.063**
Female, Non-Native			
Male, Native	−0.153**	−0.129**	−0.089**
Male, Non-Native			

** $p < 0.01$, * $p < 0.05$, two-tailed tests.

Source: own elaboration.

Table 5

Predicted probability of vocational trajectory by sex and migrant background and by non-native student concentration with test of interaction effect.

	First-difference test		
	Low	Medium	High
Female, Native	−0.062**	−0.044**	−0.004
Female, Non-Native			
Male, Native	−0.083**	−0.069**	−0.038*
Male, Non-Native			

** $p < 0.01$, * $p < 0.05$, two-tailed tests.

Source: own elaboration.

migrant origin, the differences are accentuated. On the other hand, in scenarios with a more balanced composition according to migrant origin, the differences diminish (H2.2). In fact, it was found that there were no significant differences in the probability of transitioning to professional studies among women in scenarios with more balanced percentages between native and non-native students (Tables 7–9).

Table 6

Predicted probability of academic trajectory by sex and nationality and by non-native student concentration with test of interaction effect.

	First-difference test		
	Low	Medium	High
Female, Native	−0.079**	−0.076**	−0.059**
Female, Non-Native			
Male, Native	−0.070**	−0.059**	−0.051**
Male, Non-Native			

** $p < 0.01$, * $p < 0.05$, two-tailed tests.

Source: own elaboration.

Table 7

Predicted probabilities of educational trajectory by gender and nationality. Low concentration of non-native students in school.

	Pr(Dropout)			Pr(Vocational)			Pr(Academic)		
	Margin		Std. Err.	Margin		Std. Err.	Margin		Std. Err.
Native Female	0,051	***	(0,002)	0,237	***	(0,003)	0,712	***	(0,003)
Native Male	0,042	***	(0,001)	0,245	***	(0,002)	0,713	***	(0,002)
Non-native Female	0,129	***	(0,009)	0,298	***	(0,012)	0,572	***	(0,011)
Non-native Male	0,112	***	(0,008)	0,328	***	(0,011)	0,560	***	(0,011)

Notes: Standard errors in parentheses.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 8

Predicted probabilities of educational trajectory by gender and nationality. Medium concentration of non-native students in school.

	Pr(Dropout)			Pr(Vocational)			Pr(Academic)		
	Margin		Std. Err.	Margin		Std. Err.	Margin		Std. Err.
Native Female	0,073	***	(0,003)	0,276	***	(0,005)	0,651	***	(0,005)
Native Male	0,058	***	(0,002)	0,306	***	(0,004)	0,636	***	(0,004)
Non-native Female	0,149	***	(0,007)	0,320	***	(0,011)	0,531	***	(0,011)
Non-native Male	0,117	***	(0,009)	0,376	***	(0,010)	0,507	***	(0,010)

Notes: Standard errors in parentheses.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 9

Predicted probabilities of educational trajectory by gender and nationality. High concentration of non-native students in school.

	Pr(Dropout)			Pr(Vocational)			Pr(Academic)		
	Margin		Std. Err.	Margin		Std. Err.	Margin		Std. Err.
Native Female	0,080	***	(0,007)	0,316	***	(0,010)	0,603	***	(0,010)
Native Male	0,088	***	(0,006)	0,347	***	(0,009)	0,565	***	(0,009)
Non-native Female	0,139	***	(0,010)	0,321	***	(0,014)	0,540	***	(0,014)
Non-native Male	0,140	***	(0,010)	0,384	***	(0,014)	0,476	***	(0,014)

Notes: Standard errors in parentheses.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

5. Conclusions

This paper aims to contribute scientific evidence to the field of educational inequalities pertaining to post-compulsory educational choices. Specifically, it examines the probabilities of school dropout and the selection of academic or vocational pathways in post-compulsory education. The conducted analyses aimed to investigate two specific aspects in greater detail: first, the interaction between migratory background and gender in the educational transition and the selection of different educational options; and second, how these choices vary across different scenarios based on the concentration levels of non-native students within schools.

In relation to the first objective, it was found that, among the options examined, the majority of students chose to continue their education rather than drop out, irrespective of their gender or immigrant background. Specifically, the most frequent pathway was continuity of education in the academic pathway, followed by continuing studies in the vocational pathway and, last, not continuing with post-compulsory studies. However, non-native students, all other things being equal, were more likely to drop out of school or opt for less prestigious studies -the vocational track- than their native counterparts, regardless of gender. Moreover, boys were more likely

to drop out and go on to vocational training, while girls were more likely to pursue an academic career, reflecting a more ambitious and risky choice for women within the education system.

The incorporation of an intersectionality perspective on educational inequalities allows us to delve deeper into the interaction between gender and immigrant origin, emphasising the existence of differences in the logics of educational decision-making, in transitions and in educational outcomes. The results indicate that migrant origin exerts a greater influence on educational decisions during the transition to post-compulsory education, which translates into a greater presence of non-native students in less prestigious educational transitions and in educational dropout. Similarly, it is crucial to emphasize that, concerning educational dropout, immigrant girls are more prone to discontinue their education after compulsory schooling and are less inclined to opt for vocational pathways. These distinct patterns contribute to a lower presence of female students and the masculinized character of vocational pathways. This underscores the need for implementing measures to prevent gender segregation, including enhancing the visibility of women in historically male-dominated professional fields, conducting orientation campaigns, or initiating projects to acquaint girls with technological, mathematical, and computer-related content (Termes, 2022).

In this sense, our data do not provide evidence of the immigrant paradox and reveal a combination of a slight female advantage—specifically in more prestigious educational transitions—with ethnic penalties, as suggested by various international studies (Fleischmann et al., 2014).

It is worth considering whether these specificities may be related to the characteristics and structure of the labour market (Heath & Brinbaum, 2007; Jackson, 2012). With the highest youth unemployment rate in the Eurozone, uncertain employment prospects, and a delayed timeline for labour market entry and emancipation, students from the most vulnerable groups may be discouraged from investing in education. Thus, while on the one hand, they may have an incentive to aspire to higher levels of education to mitigate this initial disadvantage, on the other hand, excessively long perceived returns to education may discourage investment in education.

The other objective of this article was to examine the impact of immigrant concentration in different scenarios, based on varying levels of non-native student concentration in schools. The results demonstrate how the probabilities of educational continuity and pathway choice, whether academic or vocational, differ across these scenarios. Specifically, it was observed that in schools with a lower presence of non-native students, the disparities in educational probabilities between native and non-native students are greater. These findings indicate that in more segregated educational environments or where there is a more unequal distribution of students based on immigrant background, the disparities are heightened. Conversely, in environments with a more balanced composition, the differences decrease. These findings indicate the importance of further research in exploring the interactive effects of socio-demographic variables at both the individual and aggregate levels. Additionally, investigating the impact of ethnic school concentration at various levels could provide valuable insights. Unfortunately, due to data limitations, it was not possible to thoroughly explore the effects of different concentration levels on mechanisms discussed in the theoretical section, including peer effects, students' expectations, familial and teacher influences, organizational factors, and school resources, among others.

In this sense, despite the robustness of the registration data analysed, it is also necessary to point out some limitations. One of the main limitations in relation to the objective of the article lies in the difficulty of delving into critical aspects such as the expectations of pupils and teachers or the effects of peers on educational transitions. Similarly, the enrolment data do not collect information on the socio-economic or educational level of students' families. This means that the data only allow us to analyse overall or gross differences between native and non-native students without being able to distinguish between the effects of social and ethnic origin. In other words, it does not allow us to disentangle between the effect of social origin or migrant origin on educational decisions in the post-compulsory transition. Likewise, it does not allow us to explore further explanations of the effect of the concentration of non-native pupils in the school on educational decisions and whether the differences are due to an effect of socio-economic background, immigrant background or a combination of both.

In this respect, although it might be assumed that the observed differences in educational transitions are attributable solely to the effects of social background, empirical evidence shows that among 'visible minorities' in less developed countries, educational disadvantage persists even after taking into account the socio-economic position of parents (Bonaf & Zancajo, 2020; Heath & Brinbaum, 2007). Therefore, it is reasonable to assume that differences in educational transitions are likely influenced by a combination of the effect of social background and migration background. In this sense, it is essential to conduct a more comprehensive analysis of educational inequalities in Spain, considering both factors to disentangle the effects of social and migrant origins.

Nevertheless, the results provide valuable insights that can serve as a basis for policy recommendations. One of the main policy recommendations has to be aimed at reducing school segregation, particularly by addressing the unequal distribution of the most vulnerable population, thereby avoiding the existence of schools with a high concentration of non-native students. It is worth noting that a reduction in school segregation does not necessarily imply a decrease in the concentration of immigrants. Implementing effective strategies requires a multifaceted approach across various institutional levels. These efforts should focus on identifying vulnerable students and promoting a balanced distribution, not only during the enrolment period but also for new students entering the education system throughout the academic year. For instance, in Catalonia, local policies have been implemented to address this issue, including the establishment of 'municipal enrolment offices,' the development of a zoning map that supports a well-balanced distribution of students, and measures to protect vulnerable educational institutions. Schools should also prioritise improvements in their orientation, avoiding biases based on sexist or racist views that, although often unconscious, persist within various social groups, including families and teachers.

CRediT authorship contribution statement

Albert Sánchez-Gelabert: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marina Elias Andreu:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Noan Bouvier:** Conceptualization.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.ijer.2024.102321](https://doi.org/10.1016/j.ijer.2024.102321).

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