Predictors of Secondary Education Completion across Portuguese Municipalities

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Portuguese educational policies have contributed to boosting secondary school attainment and thus preventing early school leaving from education and training. A more nuanced understanding of this change requires research efforts aiming at uncovering the territorial patterns of secondary school achievement and its predictors.

secondary education | school attainment | municipalities | preschool enrollment | teachers | school-to-work transition | public policies

1. Introduction

For the past decade, Portuguese educational policies have contributed to boosting secondary school attainment and thus preventing early school leaving from education and training [1]. A more nuanced understanding of this change requires research efforts aiming at uncovering the territorial patterns of secondary school achievement and its predictors. School achievement spatialities constitute, however, a marginal, though necessary trend in the international literature [2]. This is especially true considering that students tend to perform worse in low-density areas such as inland, outermost, or mountain regions. These areas are mostly rural, more isolated, less affluent, and sparsely populated [3]. Students' lower achievement in low-density regions is associated with the shortage of adequate human resources [4], inadequate infrastructures [5], or a cultural mismatch between communities and schools [6]. Some suburban areas on the outskirts of major metropolitan centers, for instance, also show lower educational outcomes [7]. School outcomes in these high-density areas are affected by other specific factors, such as the disregard for cultural diversity in curricular programs [7][8].

2. Educational Public Policies in Portugal: A Snapshot

Since 1974, after nearly 40 years of dictatorship, Portugal took significant steps to ensure universal access to education. In 1986, a new Basic Law on the Education System [9] was approved. This law stipulated mandatory education until 15 years of age and aimed at a general education common to all Portuguese citizens, implying an unspecialized, general, and universal basic education [10]. In the following years, this overarching legal framework underwent some changes. Among the most relevant are Law no. 85/2009 [11], which established the extension of mandatory education up to 12 years of studies/18 years of age and the universality of preschool education for children from 5 years of age. Later, Decree Law no. 176/2012 [12] defined a framework for preventing school failure and dropout. Following the above-mentioned legislative initiatives, Portugal has shown a favorable change in its main educational

indicators. The number of secondary school students increased continuously between 2009/2010 and 2013/2014, the peak year for the time range considered in the research, before gradually decreasing until 2018/2019, also due to demographic factors (e.g., lower birth rates) [13]. Moreover, between 2009/2010 and 2018/2019, the net secondary school enrollment evolved positively, with overall dropout rates decreasing across the country and its regions [14].

3. Structure of the Portuguese Education System

The education system in Portugal is organized as follows: (a) preschool education, corresponding to ISCED 0 (ages 3 to 5); (b) primary school, corresponding to ISCED 1, which is divided into two cycles: one encompassing levels 1 to 4 (ages 6 to 9), and another one including levels 5 and 6 (ages 10 and 11), which together correspond to ISCED-1 and ISCED-2 levels; (c) lower secondary school, composed of levels 7–9 (ages 12 to 14); (d) upper secondary school, including levels 10–12 (ages 15–17), equivalent to ISCED 3; and (d) tertiary education, ranging from post-secondary non-tertiary education (ISCED 4) to doctoral degree or equivalent (ISCED 8).

The Ministry of Education regulates the education system in Portugal from preschool up until secondary school. Schools are often organized in clusters (agrupamentos escolares), aggregating educational settings from preschool or primary school levels to lower or upper secondary school levels from the same municipality under the same administration. This means that one municipality might have one or more school clusters depending on its size and population. These school clusters also work closely with local municipalities to obtain funding and partially define the curriculum. Secondary school is overall divided into two main streams. The first one is organized as general secondary education comprising four different courses (sciences and technologies, arts, economy and humanities) and enables students to complete secondary education and to apply for tertiary education. The second stream is Vocational Education and Training (VET), aiming at students pursuing a professional diploma by the end of secondary school. However, VET students may apply to polytechnical courses as well as to universities. In the case of the latter, these students must, however, take additional exams [14].

4. Educational Attainment across Low- and High-Density Territories

Academic results differ between low- and high-density territories in various countries, regardless of educational level [3][15][16]. In secondary education, this trend is particularly visible in dropout rates, with low-density territories performing worse [3], including in Portugal [1]. Some overarching justifications have been put forward to explain these disparities. Schools in low-density territories are often far from students' homes or at perennial risk of being shut down [3]. Moreover, school values are often mismatched with communities' worldviews in these territories, with schools positioning the future of young generations in high-density territories, such as cities [16][17]. There is, however, a consensus that such results would benefit from a more granular analysis [3][18] and stronger causal interpretation [3].

It is important to underline, however, that some high-density areas in the suburban belts of major cities also present worrisome educational outcomes due to very specific reasons. These territories have become more diverse from a cultural point of view but also more socially vulnerable [8]. These communities often rely on public services and programs instead of extended families for accessing services such as education, but also to find social and instrumental

support. Subsequently, educational programs struggle to respond to students' growing diverse backgrounds, with negative impacts on school outcomes [7]. In light of this, the researchers propose examining the role of different contextual factors and educational resources in explaining disparities across low- and high-density Portuguese municipalities.

5. Secondary Education Attainment and Contextual Factors

By contextual factors, the researchers mean important socioeconomic municipal indicators related to the population's income, educational level, or occupational status, as well as municipal investment in non-formal education. These factors may contribute to disparities in student outcomes across territories. Research has shown that students from low-density areas show more vulnerable socioeconomic profiles as well as decreased school performance [19]. This usually translates into lower educational outcomes in these territories, such as more prevalent early reading difficulties [20] or a lower probability of students from these areas applying to college [21].

According to Eurostat [22], in 2021, low-density territories across the European Union showed a higher risk of poverty and a much lower rate of people who had attained tertiary education, while employment rates were identical to those in affluent areas. In Portugal, in the same year, low-density rural areas compared worse to the rest of the territory in terms of risk of poverty (26.2%; 16.4% in suburban areas; 15.6% in urban areas), rate of people aged 30–34 who have completed tertiary education (27.7%; 46.6% in suburban areas; 49.3% in urban areas), and slightly lower employment rates (72.7%; 76.3% in suburban areas; 76.7% in urban areas) [22].

An important part of the educational territorial context is the investment in education made by municipalities. This investment can include both infrastructure and human resources. Previous studies indicate a positive association between municipal school spending and overall education outcomes [23]; specific outcomes, such as Math or Language grades [24]; and future post-secondary education enrollment [25]. Still, investing solely in infrastructure is insufficient to improve school achievement [26] and is only relevant in more deprived regions (both high- and low-density) or for students coming from vulnerable households [27].

In Portugal, existing official documents, such as annual municipality reports, divide the municipal budgets across the country by main financial lines (expenses, revenues, taxes, etc.), but often do not provide a detailed description of local investments by specific domains (e.g., education) and types of expenditure (e.g., infrastructure, human resources, etc.). Therefore, the researchers can only describe the municipal investment in education by approximation. Specifically, the National Institute of Statistics collects yearly data about the level of municipal investment in culture and sports. This covers spending on cultural events, libraries, museums, and sports events, among others. In 2018, the latest year covered by the researchers' report, the municipal investment in culture and sports ranged considerably across municipalities, from 2.3% to 28.8% of the total municipal budget.

6. Secondary Education Attainment and Educational Factors

Educational factors, such as digitalization, preschool enrollment rates, school enrollment rates, or the capacity to retain teachers, may also help explain differences in students' school attainment across municipalities. Generally speaking, all

types of resources are scarcer in low-density areas. For instance, principals from rural schools tend to report greater resource shortages and how this is detrimental to learning when compared to their counterparts in urban schools [19]. Still, other findings pinpoint that unfair distribution of resources undermines the performance of those who live in more disadvantaged contexts in both high- and low-density areas [28].

One growing concern is students' equal access to technology across low- and high-density territories and its consequences [29]. Increasing access to technology does not improve school attainment by itself, and it may even decrease. Students who use technology mainly for communicating and entertainment purposes tend to have lower academic performance [30][31]. Thus, interventions aimed at improving access to technology should be followed by an investment in teacher training, educational software, and educational usage of technology [29]. Portugal has implemented the National Digital Competencies Initiative 2030 [32]. This strategy was designed to overcome deficits in students' digital skills [33] and encompasses measures such as staff training, dissemination of ICT content in basic education, and development of computation programs in the first six years of basic education [32]. This strategy has resulted in significant investments in infrastructure, although it remains unclear if these are evenly spread across the country [33].

Preschool enrollment is another educational factor that has been positively associated with school attainment. This is particularly true for students coming from disadvantaged backgrounds and territories, since it can mitigate inequalities derived from the features of their family and socioeconomic contexts [34]. Preschool education can help improve school readiness, which has a major impact on students' school attainment [35][36]. Moreover, preschool attendance has better long-term results in school achievement than later remediating interventions, both worldwide and in Portugal [34][35][37]. The location of preschool settings (low-density vs. high-density) may be associated with differences in the structural features of the environment and working conditions for staff (e.g., higher proportions of one-teacher preschools in rural areas [38]) and, subsequently, with differences in the quality of young children's experiences, namely through teacher–child interactions [39]. However, these associations have been overlooked in most research [40]. The few studies available, namely in China and the United States, suggest that rural areas have fewer available preschool settings and show lower quality provision when compared with urban settings, even though they may benefit from lower child–adult ratios [40][41][42]. In Portugal, evidence on preschool settings in high- vs. low-quality density municipalities is also scarce. Nevertheless, in 2017, the preschool attendance rate of 5-year-olds in Portugal was 89% in rural and 96% in urban settings [43].

Secondary education enrollment is also considered fundamental to prepare students to be full citizens. Despite the progress achieved between 2000 and 2019, namely a marked decrease in the number of secondary school-age young people outside the school system, there is still an urgent need to reduce regional and socioeconomic disparities in access to this level of education. Secondary school enrollment rates are much higher in urban settings worldwide [44], including in Portugal (blinded for review).

Previous studies have also reported that the capacity to retain teachers is crucial for school attainment [4][45]. Having a permanent contract means teachers face fewer mobility problems and can be more committed to their students in the long run [46]. Schools in low-density territories, such as rural areas, have more difficulty in retaining teachers, meaning there are fewer well-prepared teachers motivated to live and work in these areas [4]. Moreover, teachers working in low-

density territories report that they require more support to deal with challenges inherent to the school–parent relationship, due to these communities' greater social proximity. This may also contribute to lower percentages of permanent teachers in these areas [3]. In the long term, low teacher retention rates lead to bigger shares of older teachers in the later years of their careers, who are likely to face more challenges to their resilience and effectiveness, such as stress or feeling that their profession is not valued by society [47][48]. In 2018, about 80% of Portuguese teachers had a permanent contract. Furthermore, 47% of teachers in Portugal were aged 50 and above. In the case of upper secondary school teachers, Portugal ranked first in terms of teachers' average age and teaching experience (in number of years) compared to OECD countries involved in the TALIS study [49]. Moreover, only 9% of teachers agreed or strongly agreed that their profession is valued in society, which is lower than the average across OECD countries and economies participating in TALIS (26%). Also, 35% of Portuguese teachers reported experiencing "a lot of stress" in their work compared to the OECD average (18%) [49].

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