

## RESEARCH ARTICLE



# A Longitudinal Analysis of Early School Leaving in a Tourism-Oriented Rural Island: The Case of Crete

Nikolaos Bitsakos<sup>1,\*</sup> and Stamatina Kaklamani<sup>2</sup>

<sup>1</sup>*Department of Philosophy, University of Crete, Greece*

<sup>2</sup>*Department of Sociology, University of Crete, Greece*

**Abstract:** Early school leaving (ESL) is a critical educational and social issue, reflecting the number of students who exit the education system prematurely and often face long-term socioeconomic challenges. This longitudinal analysis investigates ESL rates in Greece, spanning from the 2008/2009 to the 2021/2022 school years. The purpose of this study is to examine the extent and determinants of ESL in Greece, with a focus on identifying regional and gender-based disparities. The study begins with an overview of ESL rates across various regions of Greece and then narrows the focus to Crete, the country's largest island, known for its tourism-oriented economy, rural landscapes, and agricultural development. By comparing ESL rates both between different regions and within the regional units of Crete, as well as analyzing gender-based differences, the research aims to elucidate ongoing trends within the socioeconomic context of the area. In summary, while our interpretative assumptions include differences between regional units linked to cultural peculiarities, the currently available data are insufficient to provide a thorough and well-founded response and do not allow us to discern differences between regional units.

**Keywords:** early school leaving, longitudinal analysis, case study

## 1. Introduction

The role of education is important for the socioeconomic development of a society, intervening decisively in the process of socialization of individuals and preparing young people through the acquisition of knowledge for their integration into the labor market. However, student dropout is currently one of the most critical issues facing the educational system and has a significant impact on the internal efficiency of education, with student attrition remaining a thorny issue for educational structures worldwide [1–3].

According to the European Union (EU) definition, early leavers are individuals who prematurely leave lower secondary education and are no longer enrolled in any education or training program [4]. Early school leaving (ESL) corresponds to the percentage of individuals aged 18–24 with these characteristics within the total population of the same age group. Specifically, this category includes individuals (a) aged 18–24 who have prematurely disengaged from education and training; (b) whose highest level of education they have attained corresponds to the lower cycle of compulsory secondary education, which is equivalent to International Standard Classification of Education (ISCED) level 0–2 (similar to the Greek gymnasium) or less; and (c) who have not participated in any education or training activities in the four weeks preceding the data collection day [4]. This definition is adopted by most research conducted in the member states of the EU and

serves as the common basis for the systematic measurement of the phenomenon by Eurostat. This study investigates ESL in Greece, with a particular focus on regional and gender disparities.

## 2. Determinants of Early School Leaving

Previous research is addressing ESL not just as a school-related problem but as a complex social phenomenon influenced by historical, economic, and political factors, which is regularly mentioned in the context of employability, lifelong learning, and social exclusion [5]. National approaches vary, with northern countries aiming for protection against the disadvantages of young people or uneven opportunities for employment and immediate entry to the labor market [6, 7]. In research conducted in Italy, an association has been found between low educational levels and lower agency and plan-making ability that seem to reduce job-finding effort [8].

Research indicates that ESL rates are influenced by various factors, including demographic characteristics, family background, and school experiences. Neighborhood characteristics such as poverty rates and additional factors such as low levels of parental education, single-parent households, and challenges faced by students with migration backgrounds appear to be more relevant with higher ESL rates [9–12]. Similar results have been found in studies that highlight the significant difference between different ethnic groups of youth in terms of parental educational attainment and poverty rates [13]. There is a large body of literature surrounding delinquency and ESL, showing that a significant relationship has been noticed between ESL and the likelihood of a first arrest, but only if the arrest occurs early in life [14, 15].

\*Corresponding author: Nikolaos Bitsakos, Department of Philosophy, University of Crete, Greece. Email: [fksp6066@fks.uoc.gr](mailto:fksp6066@fks.uoc.gr)

Research by Peraita and Pastor [16] on ESL determinants in Spain reveals that socioeconomic factors play a crucial role in students' educational outcomes. The study found that family income and social class significantly influenced students' decisions to leave school and particularly that higher family income levels reduced the probability of ESL, while children from low-income families, especially those receiving unemployment benefits, were more likely to leave school early. Additionally, regional labor market conditions, such as youth unemployment rates and city size, affected ESL behavior, with rural areas showing higher dropout rates compared to larger cities, while industrial areas requiring medium to high-skilled workers see students staying in education with the expectation of securing a job in the labor market [17]. The above are consistently configured by transition regimes from education to work implemented by each country that drastically affect youth life trajectories and expectations [7].

Regarding the perception of causes of ESL between educators and students, recent data vary. Schoon and Parsons [18] found that teenage aspirations, along with educational attainment, significantly influence occupational development and mediate socioeconomic background effects. While educators focused on systemic factors (national policies, economic difficulties, and challenges in the education system), as well as individual problems (mental health disorders, low motivation, ambition), young people expressed that social relationships and educational characteristics were the most significant influences on ESL risks with negative school experiences leading to increased dropout rates [19, 20].

At the same time, educational aspirations and choices are often determined by labor market characteristics and the relative demand for labor [11, 12, 18]. Some authors also highlight the degree of urbanization as an interpretive indicator of ESL rates, linking the levels of the phenomenon with the general characteristics shaping the range and degree of differentiation of economic activities and urban lifestyle patterns [21, 22].

### 3. Tourism's Role in Shaping Early School Leaving Trends

In Crete, tourism is crucial in influencing the socioeconomic environment, especially in developed regions like Heraklion and Chania [23–25]. Seasonal job openings in tourism can lead to ESL, as students—particularly boys—are enticed into working during busy periods to assist their families [6, 7]. This trend highlights the necessity for specific educational policies to lessen the effects of tourism-related job pressures on student retention. Moreover, the impact of tourism on cultural values may influence views on education, where the immediate financial gains from tourism jobs could be prioritized over long-term educational success [17, 24]. Urban regions enjoy enhanced infrastructure and accessibility resulting from concentrated tourism growth, whereas rural areas encounter more significant obstacles, potentially worsening regional differences in educational achievement [25, 26].

This occurrence is not confined to Crete. In various regions of Spain, having available positions for unskilled workers greatly impacts local communities, influencing numerous aspects of life, including education [16]. The seasonal aspect of tourism jobs can result in comparable trends of early school dropouts, as youths might focus on immediate earnings instead of ongoing education [27].

These instances underscore the wider effects of tourism-reliant economies on educational systems in island areas, stressing the need for integrated strategies that take into account local economic circumstances to adequately tackle ESL.

This study investigates ESL in Greece, focusing on regional and gender disparities. The research addresses three questions: (1) How do ESL rates vary regionally and within Crete? (2) What are the gender-specific ESL trends? (3) How do socioeconomic, cultural, and geographical factors influence these trends? The findings aim to enhance understanding and guide interventions to reduce ESL.

## 4. Methods and Data

For this longitudinal analysis, data on ESL rates were obtained from the Hellenic Statistical Authority (ELSTAT) and Eurostat, specifically from the Eurostat dataset on early leavers from education and training (educ\_uoe\_enra28) [28]. Additionally, national data on school population and staff were sourced from ELSTAT [29], while broader demographic trends were drawn from the 2021 Population and Housing Census<sup>1</sup>. Furthermore, insights from existing literature, including studies on learning losses during COVID-19 [30], provide context for understanding ESL trends in Greece. The data cover the school years from 2008/2009 to 2021/2022, which are the latest available. After a brief analysis of current ESL rates in regions of Greece, we focus on ESL rates between the regional units of Crete (Chania, Rethymno, Herakleio, Lasithi), Greece's largest island, which is characterized by its tourism-oriented economy, rural landscapes, and agricultural development. We present longitudinal data between regions, regional units, and gender comparisons, with the aim to explain ongoing trends in the socioeconomic context of the area, identifying region-specific and gender-specific disparities in ESL rates, uncovering underlying socioeconomic and cultural influences, and providing targeted insights for effective policy interventions.

We focused on lower secondary education because it represents a pivotal stage in Greece's education system, marking the final phase of compulsory schooling where dropout rates have significant long-term impacts. Additionally, the data for this level were more consistent and comparable across regions, enabling a clearer analysis of ESL trends. We present longitudinal comparisons between regions, regional units, and genders to uncover patterns and disparities in ESL rates influenced by socioeconomic, cultural, and geographical factors. These comparisons allow us to identify region-specific challenges and gender-based differences, offering deeper insights into the dynamics of ESL and guiding targeted interventions.

The data rely heavily on national statistics that may not capture localized differences, such as variations in the measurement of school dropout rates or differences in how schools report dropout incidents, especially in rural or isolated areas. These inconsistencies could introduce biases and limit the generalizability of findings to a larger context. Additionally, regional disparities in the availability of educational resources and local policies could further influence the dropout rates, making it essential to interpret the findings with caution. Further in-depth data from local education authorities, with clear and consistent reporting practices, would enhance the reliability of the results and provide a more nuanced understanding of the regional dynamics at play.

## 5. Extent of the Phenomenon in Greece

Based on the latest available data [28], Greece is among the countries where the rates of ESL for lower secondary education are

<sup>1</sup>Hellenic Statistical Authority, "Census Results of the 2021 Population and Housing," 2023, [https://www.statistics.gr/en/news-announcements/-/asset\\_publisher/oj6VK3PQ0oCe/content/census2022?utm\\_source](https://www.statistics.gr/en/news-announcements/-/asset_publisher/oj6VK3PQ0oCe/content/census2022?utm_source)

**Table 1**  
**ESL rates by region in Greece for the 2021/2022 school year in lower secondary education**

| Region                       | Total students | Students who dropped out | Percentage (%) |
|------------------------------|----------------|--------------------------|----------------|
| Eastern Macedonia and Thrace | 17938          | 188                      | 1.05           |
| Central Macedonia            | 59540          | 666                      | 1.12           |
| Western Macedonia            | 7750           | 25                       | 0.32           |
| Thessaly                     | 22464          | 228                      | 1.01           |
| Epirus                       | 9637           | 159                      | 1.65           |
| Ionian Islands               | 7041           | 31                       | 0.44           |
| Western Greece               | 20320          | 62                       | 0.31           |
| Central Greece               | 15336          | 115                      | 0.75           |
| Peloponnese                  | 16502          | 64                       | 0.39           |
| Attica                       | 117493         | 948                      | 0.81           |
| Northern Aegean              | 5835           | 64                       | 1.10           |
| Southern Aegean              | 11892          | 66                       | 0.55           |
| Crete                        | 23423          | 142                      | 0.61           |
| Overall total                | 335171         | 2758                     | 0.82           |

**Source:** Elaboration of data from the Hellenic Statistical Authority [29]

particularly low, below the European average (Greece: 0.99% and EU: 2.23%), significantly deviating from the 2030 target (9%). It is worth noting that the country has shown significant improvement in recent years, considering that in 2011, it was among the countries with the highest ESL rates (2015: 3.30%). Regarding inequalities among the regions of Greece, there are significant spatial variations, with the highest ESL rates recorded in the islands of the Northern Aegean, Eastern Central Greece, and Macedonia and Thrace (Table 1). Conversely, the lowest rates are observed in Western Greece (0.31%), Western Macedonia (0.32%), and the Peloponnese (0.39%). Often, but not systematically, the comparatively higher ESL rates are recorded in regions where indicators reflecting aspects of youth integration into the socioeconomic fabric, such as youth Not in Education, Employment, or Training (NEET) rates and unemployment indices, are also at unfavorable levels. However, as already mentioned, ESL is a particularly complex phenomenon, with multiple factors influencing its occurrence and intensity. Generally, there are no significant differences between the regions, regardless of the characteristics of the developing economic activities and the degree of economic diversification and urbanization of each region (Table 1). Regardless of gender, the highest values are recorded in Central Macedonia (1.12%) and Epirus (1.65%).

Investigating the phenomenon in relation to the gender of early school leavers, the above picture shows slight variations between the two genders, but they are not particularly significant. In most regions, ESL is more common among boys, with this discrepancy being most pronounced in Thessaly and Epirus. Exceptions appear to be the islands of Western Macedonia and Southern Aegean, although the exceedance in these cases is not substantial (Table 2).

## 6. Early School Leaving in the Region of Crete

The phenomenon of ESL in the Region of Crete is examined in detail by Greek statistical authorities, with reference to the regional units. The current analysis covers the school years from 2008/2019 to

2021/2022, where the ESL rates are calculated based on the number of students in lower secondary education who did not complete their enrollment for the respective academic year compared to the number of those who were enrolled at the beginning of the same year [29].

During the first six-year period, a slight downward trend in ESL rates was observed across the Region of Crete (Figure 1). During the same period, the regional unit of Heraklion exhibited the highest intensity of the phenomenon, consistently surpassing the regional average. The significant population size of the Heraklion regional unit evidently has a decisive impact on the ESL rates reported at the level of the Region of Crete. The other three regional units reported rates below the regional average. At the peak of the economic crisis, the phenomenon showed stagnation. This was followed by several years with some sharp upward fluctuations in ESL rates, as if the economic crisis had temporarily hindered the trend of educational and training abandonment. In the regional unit of Lasithi, the increasing trends were comparatively more pronounced.

A significant discrepancy is observed between the measurements for the period 2008/2009–2013/2014 (Figure 1), where ESL rates ranged from 3.05% to 6.46%, and the subsequent period 2014–2021, where dropout rates ranged from 0.19% to 1.16% (Figure 2). Although there are no significant fluctuations in the student population size during this period, a notable reduction in the number of students dropping out is evident [29].

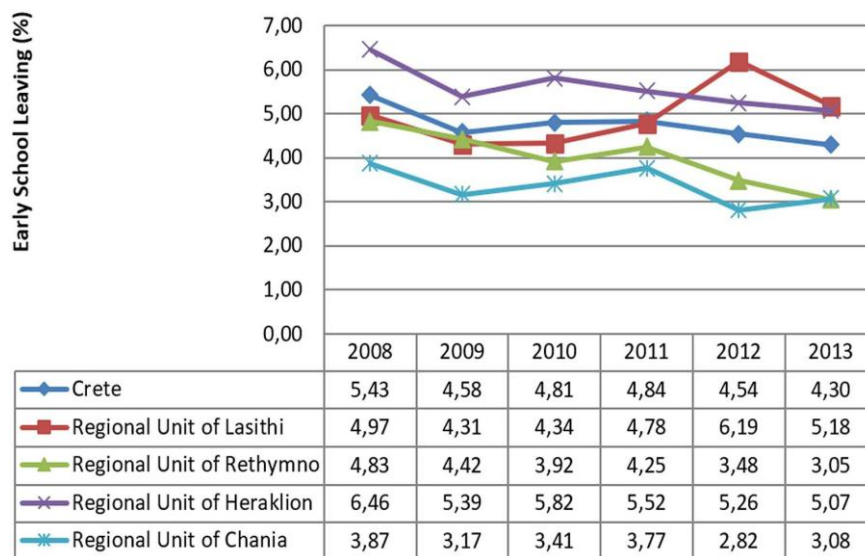
In the early years of the subsequent eight-year period (2014/2015–2021/2022), the exacerbation of the phenomenon continues, as noted above. This trend appears to affect the smaller population regional units (Rethymno and Lasithi) compared to the more urbanized regional units (Heraklion and Chania). The greater impact on smaller population areas may reflect limited access to educational infrastructure and fewer opportunities for academic support in these regions. However, over time, these differences seem to diminish (Figure 2), possibly indicating the gradual effectiveness of policies aimed at reducing inequalities or the convergence of socioeconomic conditions across regional units.

**Table 2**  
ESL rates by region and gender for the 2021/2022 school year in lower secondary education

| Region                       | Total Students |        | Students Who Dropped Out |       | Difference (%) |
|------------------------------|----------------|--------|--------------------------|-------|----------------|
|                              | Boys           | Girls  | Boys                     | Girls |                |
| Eastern Macedonia and Thrace | 9273           | 8665   | 105                      | 83    | -0.17          |
| Central Macedonia            | 30640          | 28900  | 392                      | 274   | -0.33          |
| Western Macedonia            | 3989           | 3761   | 9                        | 16    | 0.20           |
| Thessaly                     | 11602          | 10862  | 144                      | 84    | -0.47          |
| Epirus                       | 5139           | 4498   | 101                      | 58    | -0.68          |
| Ionian Islands               | 3673           | 3368   | 21                       | 10    | -0.27          |
| Western Greece               | 10659          | 9661   | 35                       | 27    | -0.05          |
| Central Greece               | 8047           | 7289   | 67                       | 48    | -0.17          |
| Peloponnese                  | 8578           | 7924   | 35                       | 29    | -0.04          |
| Attica                       | 60817          | 56676  | 545                      | 403   | -0.19          |
| Northern Aegean              | 2972           | 2863   | 37                       | 27    | -0.30          |
| Southern Aegean              | 6053           | 5839   | 31                       | 35    | 0.09           |
| Crete                        | 12064          | 11359  | 83                       | 59    | -0.17          |
| Overall total                | 173506         | 161665 | 1605                     | 1153  | -0.21          |

Source: Elaboration of data from the Hellenic Statistical Authority [29]

**Figure 1**  
ESL rates in the region of Crete for the school years 2008/2009–2013/2014



Source: Elaboration of data from the Hellenic Statistical Authority [29]

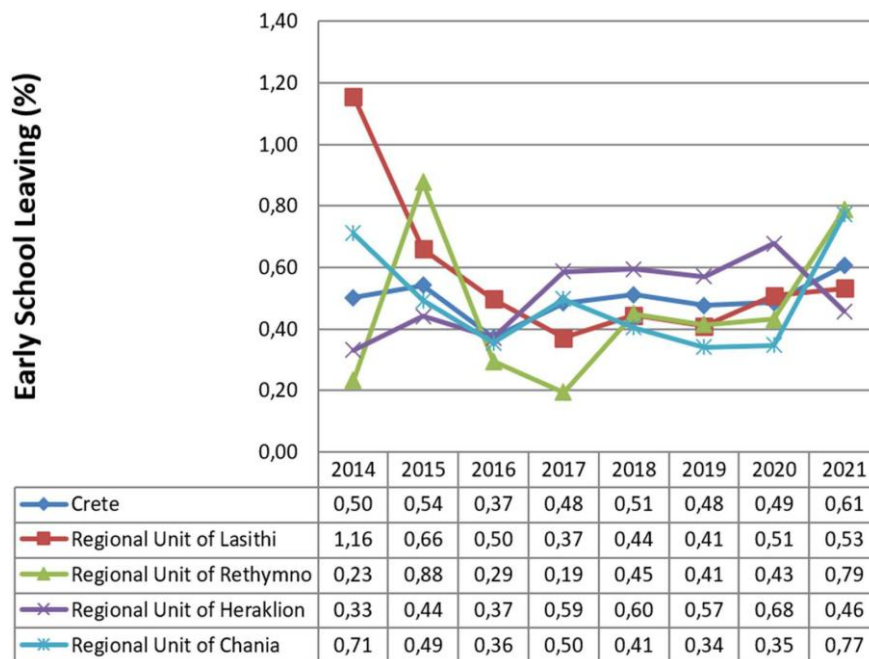
### 6.1. Early school leaving by grade and gender in the region of Crete

Regarding ESL rates by grade in lower secondary education, it is observed in Crete that the majority of students leave school at the beginning of the level, specifically in the first year of gymnasium, where the dropout rate is 0.87%. As shown in Figure 3, the ESL rates vary across different grades and regional units, with the first year of gymnasium exhibiting the highest dropout rates across most areas. This rate gradually decreases in the subsequent two grades (0.47% and 0.46%, respectively). This trend is also observed in the regional units of Heraklion and Lasithi, where dropout rates continuously decrease, possibly reflecting improved retention efforts or better adaptation as students' progress through grades. Conversely, in the regional unit of Chania, while ESL decreases in the second

year, it increases again in the final grade of the level. In the regional unit of Rethymno, there is a significant increase in dropout rates in the second year, followed by a decrease in the third year, indicating possible challenges unique to the second-year curriculum or socio-economic factors that create temporary pressures before stabilizing in the final year (Table 3).

In Crete, concerning ESL rates by grade and gender in lower secondary education, it is observed that the majority of girls leave school at the start of the level, specifically in the first year of gymnasium (1.00%), with this rate gradually decreasing in the subsequent two grades (0.59% and 0.44%, respectively). This pattern may indicate that the transition from primary to secondary education poses a significant challenge for girls, possibly due to cultural or social expectations that disproportionately affect them during this critical period. In contrast, boys appear to leave school at similar

**Figure 2**  
ESL rates in the region of Crete for the school years 2014/2015–2021/2022



Source: Elaboration of data from the Hellenic Statistical Authority [29]

**Table 3**  
ESL rates by grade and regional unit in the region of Crete at the end of the 2021/2022 school year

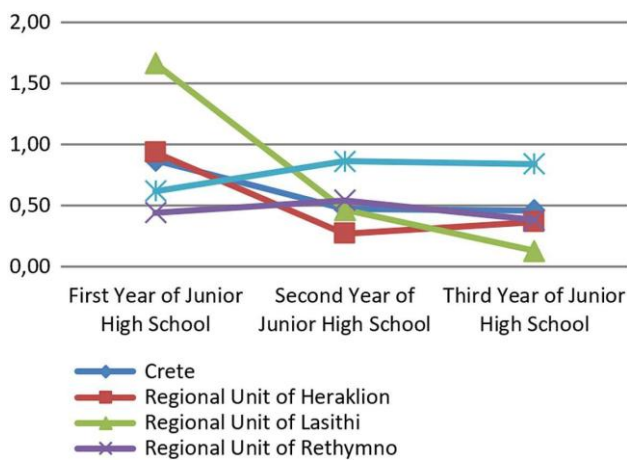
|                                   | Total students | Students who dropped out | Percentage (%) |
|-----------------------------------|----------------|--------------------------|----------------|
| <b>Regional Unit of Heraklion</b> | 12025          | 64                       | 0.53           |
| First Year of Junior High School  | 4166           | 39                       | 0.94           |
| Second Year of Junior High School | 4052           | 11                       | 0.27           |
| Third Year of Junior High School  | 3807           | 14                       | 0.37           |
| <b>Regional Unit of Lasithi</b>   | 2538           | 20                       | 0.79           |
| First Year of Junior High School  | 901            | 15                       | 1.66           |
| Second Year of Junior High School | 863            | 4                        | 0.46           |
| Third Year of Junior High School  | 774            | 1                        | 0.13           |
| <b>Regional Unit of Rethymno</b>  | 3286           | 15                       | 0.46           |
| First Year of Junior High School  | 1132           | 5                        | 0.44           |
| Second Year of Junior High School | 1104           | 6                        | 0.54           |
| Third Year of Junior High School  | 1050           | 4                        | 0.38           |
| <b>Regional Unit of Chania</b>    | 5574           | 43                       | 0.77           |
| First Year of Junior High School  | 1943           | 12                       | 0.62           |
| Second Year of Junior High School | 1849           | 16                       | 0.87           |
| Third Year of Junior High School  | 1782           | 15                       | 0.84           |
| <b>Crete</b>                      | 23423          | 142                      | 0.61           |
| First Year of Junior High School  | 8142           | 71                       | 0.87           |
| Second Year of Junior High School | 7868           | 37                       | 0.47           |
| Third Year of Junior High School  | 7413           | 34                       | 0.46           |

Source: Elaboration of data from the Hellenic Statistical Authority [29]



Figure 3

ESL rates by grade and regional unit in the region of Crete at the end of the 2021/2022 school year



Source: Elaboration of data from the Hellenic Statistical Authority [29]

rates across all three grades, suggesting that their dropout decisions are less influenced by transitional periods and more likely tied to persistent external factors, such as labor opportunities or behavioral disengagement. The previously identified variations in ESL by gender or grade, as described in the previous sections, show slight differences in intensity when both characteristics—gender and grade—are considered together. Nevertheless, the fundamental observations remain robust (Table 4).

## 7. Discussion

ESL continues to be a concern for the educational community and is a phenomenon observed across all regions of Greece, though with varying intensity. Recently, Crete appears to have some of the lowest dropout rates, and during the studied period (2008/2009–2021/2022), there has been a notable improvement in the situation, despite some of fluctuations previously mentioned. This research highlights the multifaceted nature of ESL, providing valuable insights into regional disparities, socioeconomic influences, and the critical need for targeted, evidence-based policies to improve educational outcomes and equity, particularly in geographically and economically diverse areas like Crete.

Specifically, during the first six-year period (2008/2009–2013/2014), there were fluctuations in recorded dropout rates. Potential causes for these fluctuations include the effects of the recent acute socioeconomic crisis, with austerity measures causing significant disruptions in the living conditions of Crete's residents. The contraction of incomes, combined with the high cost of education (preparation for entrance exams, foreign language learning, etc.), burdened family budgets, making it difficult and discouraging for families with young children to continue their educational participation [9, 10].

In the subsequent six-year period (2014/2015–2021/2022), there was a general significant decline in dropout rates, followed by a stabilization of these rates. This sharp and particularly pronounced change in recorded rates, in our view, is not related to the phenomenon itself but to changes in the data collection methodology, as previously mentioned. The 2019–2020 and 2020–2021 school years saw major disruptions to educational operations due to the

Table 4

ESL rates by gender, grade, and regional unit in the region of Crete at the end of the 2021/2022 school year

|                                   | Total Students |       | Students who dropped out |       | Percentage (%) |       |
|-----------------------------------|----------------|-------|--------------------------|-------|----------------|-------|
|                                   | Boys           | Girls | Boys                     | Girls | Boys           | Girls |
| <b>Regional Unit of Heraklion</b> | 6235           | 5790  | 39                       | 25    | 0.63           | 0.43  |
| First Year of Junior High School  | 2135           | 2031  | 23                       | 16    | 1.08           | 0.79  |
| Second Year of Junior High School | 2114           | 1938  | 8                        | 3     | 0.38           | 0.15  |
| Third Year of Junior High School  | 1986           | 1821  | 8                        | 6     | 0.40           | 0.33  |
| <b>Regional Unit of Lasithi</b>   | 1283           | 1255  | 12                       | 8     | 0.94           | 0.64  |
| First Year of Junior High School  | 464            | 437   | 10                       | 5     | 2.16           | 1.14  |
| Second Year of Junior High School | 413            | 450   | 2                        | 2     | 0.48           | 0.44  |
| Third Year of Junior High School  | 406            | 368   | 0                        | 1     | 0.00           | 0.27  |
| <b>Regional Unit of Rethymno</b>  | 1701           | 1585  | 9                        | 6     | 0.53           | 0.38  |
| First Year of Junior High School  | 589            | 543   | 2                        | 3     | 0.34           | 0.55  |
| Second Year of Junior High School | 568            | 536   | 5                        | 1     | 0.88           | 0.19  |
| Third Year of Junior High School  | 544            | 506   | 2                        | 2     | 0.37           | 0.40  |
| <b>Regional Unit of Chania</b>    | 2845           | 2729  | 23                       | 20    | 0.81           | 0.73  |
| First Year of Junior High School  | 1006           | 937   | 7                        | 5     | 0.70           | 0.53  |
| Second Year of Junior High School | 953            | 896   | 9                        | 7     | 0.94           | 0.78  |
| Third Year of Junior High School  | 886            | 896   | 7                        | 8     | 0.79           | 0.89  |
| <b>Crete</b>                      | 12064          | 11359 | 83                       | 59    | 0.41           | 0.69  |
| First Year of Junior High School  | 4194           | 3948  | 42                       | 29    | 0.49           | 1.00  |
| Second Year of Junior High School | 4048           | 3820  | 24                       | 13    | 0.45           | 0.59  |
| Third Year of Junior High School  | 3822           | 3591  | 17                       | 17    | 0.28           | 0.44  |

Source: Elaboration of data from the Hellenic Statistical Authority [29]

COVID-19 epidemic [30]. The extended school closures and the quick switch to remote learning probably made matters worse, especially in rural and low-income areas with little access to technology. The whole impact of the pandemic on ESL trends is yet unknown, and additional longitudinal research may be required to evaluate any latent impacts on educational participation, even if overall ESL rates in Crete were steady during this time.

Considering both international and Greek experiences, factors influencing or shaping the intensity of dropout include the broader socioeconomic environment and aspects of the prevailing cultural framework, which shape social representations and dominant values. Specifically, values that shape the function of the family institution play a crucial role in gender role distribution. Dominant gender roles and stereotypes determine behavior and expectations for each gender. The traditional pattern remains strong, and the more frequent dropout of girls from school seems to be linked to prioritizing marriage and family creation [10, 11]. On the other hand, the desired and “ideal” pattern for boys is significantly influenced by the primary economic activity developing in each region and the behavioral model it entails [12, 18]. We can mention here the impact of tourism development in Crete as well as the ongoing strong behavioral model associated with livestock activities, considering that these two factors significantly or less significantly influence aspects of boys’ behavior [21, 22]. In our view, another factor that should be included in our considerations is the geomorphological characteristics of students’ residential areas, focusing on the degree of mountainous terrain and proximity to regional administrative or urban centers. Issues of access and the objective possibilities of students’ mobility, both to attend school and to have better preparation for continuing their studies, are relevant.

Objectively, this variation in available opportunities affects students’ attitudes toward the educational process. In the case of Crete’s regional units and the identified differences, it seems that the degree of urbanization positively affects staying in the educational system, while access and proximity issues, as partially reflected by the degree of mountainous terrain, act as deterrents to continuing school attendance [31]. However, there are peculiarities in the population distribution within regional units that cannot be explored within the scope of this work—due to the lack of recent detailed data, such as the spatial distribution of the population by municipality and the potential population retention in municipalities close to the central road axes of each regional unit [31, 32]. Mainly, the data needed to understand the deviations between regional units involve other demographic, social, and economic characteristics of the municipalities, as well as the available educational structures and infrastructures. To strengthen the study’s internal validity, it is important to consider potential confounding variables and biases, especially those linked to specific educational policies during the study period. For instance, educational reforms or changes in national curricula could have significantly impacted dropout rates by altering students’ engagement or expectations. Socioeconomic factors, such as income levels and unemployment rates, might also have influenced students’ decisions to leave school, especially during periods of economic downturn. Fluctuations in government funding and resource allocation, particularly in disadvantaged areas, could have created disparities in educational opportunities and contributed to higher dropout rates. Additionally, changes in regional or national policies, such as child labor laws or student support programs, may have introduced biases by influencing the decisions of both students and families during specific time frames.

Our research has identified differences both between the region of Crete and other regions of the country and among the island’s

regional units. This implies that differences in dropout rates cannot be understood without considering characteristics related to the socioeconomic environment, as shaped by developing economic activities and their historical evolution. At the regional level in Crete, the main economic sectors in all regional units are related to tourism, commerce, and transport, while industrial activities are primarily developed in the two major urban centers of Heraklion and Chania [16, 17].

Given that student dropout is a complex phenomenon influenced by a variety of factors, we must insist on the need for detailed data at a lower level than the regional unit. In Crete, ESL may be due to factors such as lack of sufficient equipment in schools, inadequate implementation of educational policies, and insufficient funding. Therefore, further investigation is necessary to address ESL. Additionally, educational authorities can focus on improving educational infrastructure in comparatively isolated areas [33, 34].

Improved educational support systems should be the focus of efforts in rural regions like Lasithi and Rethymno, where dropout rates are greater and resources are scarcer. Addressing the demands of regional sectors, especially tourism, is also essential. Initiatives that prioritize education’s long-term worth over its immediate financial gains might lessen the allure of entering the workforce too soon. Furthermore, as females seem to have more difficulties at this time, extra steps should be taken to assist them during the transition from primary to secondary education.

This study addresses a critical gap in the education research literature by offering a detailed, region-specific analysis of ESL trends over an extended period, focusing on the island of Crete, a geographically and socioeconomically diverse region. Unlike broader national or cross-country studies that often overlook local disparities, this research provides granular insights into how regional factors—such as urbanization, economic activities, cultural norms, and geographic challenges—affect ESL rates. The research contributes to a deeper understanding of inequities in education access and outcomes by examining fluctuations in dropout rates during periods of economic crisis and recovery, emphasizing the impact of socioeconomic and policy shifts and by identifying factors such as the heightened dropout risk for girls during the transition from primary to secondary education or the challenges faced by rural areas.

In summary, while our interpretative assumptions include differences between regional units linked to cultural peculiarities, the currently available data are insufficient to provide a thorough and well-founded response and do not allow us to discern differences between regional units. We believe that further qualitative data, not currently available, as well as information on educational policies possibly implemented at the regional unit level, along with an assessment of their outcomes, are required. These data would clarify the differences recorded between regional units, which do not appear to be particularly significant.

## Ethical Statement

This study does not contain any studies with human or animal subjects performed by any of the authors.

## Conflicts of Interest

The authors declare that they have no conflicts of interest to this work.

## Data Availability Statement

The data that support the findings of this study are openly available on the Hellenic Statistical Authority at <https://www.statistics.gr/>.

## Author Contribution Statement

**Nikolaos Bitsakos:** Conceptualization, Methodology, Validation, Formal analysis, Investigation, Resources, Writing – original draft, Writing – review & editing. **Stamatina Kaklamani:** Conceptualization, Methodology, Validation, Investigation, Resources, Writing – original draft.

## References

- [1] McKenna, D., & Simmie, G. M. (2024). Framing early school leaving interventions and their policy responses: A critical literature review of mainstream narratives and counter-narratives. *International Journal of Critical Pedagogy*, 13(1), 67–88. <https://janeway.uncpress.org/ijcp/article/id/1285/>
- [2] Council of the European Union. (2021). *Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030)*. Retrieved from: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G0226\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G0226(01))
- [3] Alexiadou, N., & Rambla, X. (2023). Education policy governance and the power of ideas in constructing the new European Education Area. *European Educational Research Journal*, 22(6), 852–869. <https://doi.org/10.1177/14749041221121388>
- [4] European Education and Culture Executive Agency: Eurydice. (2014). *Tackling early leaving from education and training in Europe: Strategies, policies and measures*. Luxembourg: Publications Office of the European Union. <https://data.europa.eu/doi/10.2797/33979>
- [5] Guerrero Puerta, L. (2023). The European educational policy and early school leaving: A conceptual analysis from the perspective of the leaving subject. *Philosophies*, 8(5), 86. <https://doi.org/10.3390/philosophies8050086>
- [6] Behr, A., Giese, M., Tegum Kamdjou, H. D., & Theune, K. (2021). Motives for dropping out from higher education — An analysis of bachelor's degree students in Germany. *European Journal of Education*, 56(2), 325–343. <https://doi.org/10.1111/ejed.12433>
- [7] Roberts, K. (2022). Integrating young people into the workforce: England's twenty-first century solutions. *Societies*, 12(2), 38. <https://doi.org/10.3390/soc12020038>
- [8] Simões, F., Marta, E., Marzana, D., Alfieri, S., & Pozzi, M. (2021). An analysis of social relationships' quality associations with hope among young Italians: The role of NEET status. *Journal of Applied Youth Studies*, 4(2), 169–184. <https://doi.org/10.1007/s43151-021-00034-8>
- [9] Patterson, R. (2008). Neighborhood effects on high-school drop-out rates and teenage childbearing. *SSRN*. <https://doi.org/10.2139/ssrn.1134940>
- [10] Koenig, A. M., & Eagly, A. H. (2014). Evidence for the social role theory of stereotype content: Observations of groups' roles shape stereotypes. *Journal of Personality and Social Psychology*, 107(3), 371. <https://doi.org/10.1037/a0037215>
- [11] Van Den Bergh, L., Pouille, A., Vandeveld, S., & De Pauw, S. S. (2022). Looking beyond primary barriers: Support workers' perspectives on school dropout among students with a migration background. *Journal of Ethnic & Cultural Diversity in Social Work*, 33(1), 34–46. <https://doi.org/10.1080/15313204.2022.2094519>
- [12] Bianchi, D., Cavicchiolo, E., Lucidi, F., Manganelli, S., Girelli, L., Chirico, A., & Alivernini, F. (2021). School dropout intention and self-esteem in immigrant and native students living in poverty: The protective role of peer acceptance at school. *School Mental Health*, 13(2), 266–278. <https://doi.org/10.1007/s12310-021-09410-4>
- [13] Bocsi, V., Varga, A., & Fehérvári, A. (2023). Chances of early school leaving—With special regard to the impact of Roma identity. *Education Sciences*, 13(5), 483. <https://doi.org/10.3390/educsci13050483>
- [14] Ward, S., Williams, J., & van Ours, J. C. (2021). Delinquency, arrest and early school leaving. *Oxford Bulletin of Economics and Statistics*, 83(2), 411–436. <https://doi.org/10.1111/obes.12393>
- [15] Nelson, D. M., Coleman, D., & Corcoran, K. (2010). Emotional and behavior problems in urban and rural adjudicated males: Differences in risk and protective factors. *Victims & Offenders*, 5(2), 120–129. <https://doi.org/10.1080/15564881003640710>
- [16] Peraita, C., & Pastor, M. (2000). The primary school dropout in Spain: The influence of family background and labor market conditions. *Education Economics*, 8(2), 157–168. <https://doi.org/10.1080/096452900410721>
- [17] Oliver-Rullán, X., & Rosselló-Villalonga, J. (2019). Does the economic productive structure determine early school leaving rates? Evidence from Spanish regions, 2000–2013. *Estudios sobre Educación*, 36, 181–205. <https://doi.org/10.15581/004.36.181-205>
- [18] Schoon, I., & Parsons, S. (2002). Teenage aspirations for future careers and occupational outcomes. *Journal of Vocational Behavior*, 60(2), 262–288. <https://doi.org/10.1006/JVBE.2001.1867>
- [19] Brown, C., Douthwaite, A., Costas, Batlle, I., & Savvides, N. (2022). A multi-stakeholder analysis of the risks to early school leaving: Comparing young peoples' and educators' perspectives on five categories of risk. *Journal of Youth Studies*, 27(3), 414–438. <https://doi.org/10.1080/13676261.2022.2132139>
- [20] Witherspoon, D., & Ennett, S. (2011). Stability and change in rural youths' educational outcome through the middle and high school years. *Journal of Youth & Adolescence*, 40(9), 1077–1090. <https://doi.org/10.1007/s10964-010-9614-6>
- [21] Bonnet, J., & Murtin, F. (2024). Why do students leave school early in OECD countries? The role of regional labor markets and school policies. *Journal of Regional Science*, 64(2), 277–307. <https://doi.org/10.1111/jors.12671>
- [22] Weiss, J., & Heinz-Fischer, C. (2022). The more rural the less educated? An analysis of national policy strategies for enhancing young adults' participation in formal and informal training in European rural areas. *Youth*, 2(3), 405–421. <https://doi.org/10.3390/youth2030030>
- [23] Mavridoglou, G., Giantsi, T., Tselentis, B., Anagnostelos, K., & Prokopiou, D. (2020). Tourism infrastructure, health, and environment for the island of Crete. *WIT Transactions on Ecology and the Environment*, 241, 3–14. <https://doi.org/10.2495/SDP200011>
- [24] Polykretis, C., & Alexakis, D. D. (2021). Spatial stratified heterogeneity of fertility and its association with socio-economic determinants using Geographical Detector: The case study of Crete Island, Greece. *Applied Geography*, 127, 102384. <https://doi.org/10.1016/j.apgeog.2020.102384>



- [25] van Maarseveen, R. (2021). The urban–rural education gap: Do cities indeed make us smarter? *Journal of Economic Geography*, 21, 683–714. <https://doi.org/10.1093/jeg/lbaa033>
- [26] Zahl-Thanem, A., & Rye, J. F. (2024). Spatial inequality in higher education: A growing urban–rural educational gap? *European Sociological Review*, 40(6), 1067–1081. <https://doi.org/10.1093/esr/jcae015>
- [27] Ito, S., & Shonchoy, A. (2020). Seasonality, academic calendar, and school drop-outs in developing countries. In *Working Papers 2013*. Florida International University.
- [28] European Commission. (2023). *Early leavers from education and training statistics*. Retrieved from: [https://ec.europa.eu/eurostat/statistics-explained/index.php/Early\\_leavers\\_from\\_education\\_and\\_training](https://ec.europa.eu/eurostat/statistics-explained/index.php/Early_leavers_from_education_and_training)
- [29] Hellenic Statistical Authority. (2021). *Lower secondary education schools (pupils, schools, staff) (beginning & end of the school year) / 2021*. Retrieved from: <https://www.statistics.gr/el/statistics/-/publication/SED21/->
- [30] Uğras, M., Zengin, E., Papadakis, S., & Kalogiannakis, M. (2023). Early childhood learning losses during COVID-19: Systematic review. *Sustainability*, 15(7), 6199. <https://doi.org/10.3390/su15076199>
- [31] Baum-Snow, N. (2007). Did highways cause suburbanization? *The Quarterly Journal of Economics*, 122(2), 775–805.
- [32] Proost, S., & Thisse, J.-F. (2019). What can be learned from spatial economics? *Journal of Economic Literature*, 57(3), 575–643.
- [33] Doyle, G., & Keane, E. (2018). ‘Education comes second to surviving’: Parental perspectives on their child/ren’s early school leaving in an area challenged by marginalisation. *Irish Educational Studies*, 38(1), 71–88. <https://doi.org/10.1080/03323315.2018.1512888>
- [34] European Commission. (2024). *Education and training monitor 2024: Comparative report*. Luxembourg: Publications Office of the European Union. <https://doi.org/10.2766/815875>

**How to Cite:** Bitsakos, N., & Kaklamani, S. (2026). A Longitudinal Analysis of Early School Leaving in a Tourism-Oriented Rural Island: The Case of Crete. *International Journal of Changes in Education*, 3(2), 235–243. <https://doi.org/10.47852/bonviewIJCE52024436>