

## **Pupils Left Behind? An Analysis on the Data from National Evaluation Exams in Romania 2023**

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### **Abstract**

*In the 2022-2023 school year, about 47% of candidates were admitted to their first-choice high school, while 1.44% were not admitted to any school. This research paper explores the dynamics of Romania's educational landscape, focusing on the National Evaluation Exams in the 2022-2023 school year. The paper investigates the path of pupils who, despite obtaining passing final admission scores, were not assigned in the first admission round to an upper-secondary educational facility. Two crucial research questions guide this study: on one hand, how many of these students competed in a different county than their residential county? On the other hand, what similarities and differences exist among them in terms of performance at the National Exam and average scores in the lower-secondary educational cycle? The findings aim to shed light on the challenges and opportunities within Romania's education system.*

**Key words:** educational system, upper secondary education, National Evaluation Exam, cluster analysis, R-Shiny

**J.E.L. classification:** A19

### **1. Introduction**

Successfully completing the upper secondary school cycle “is often considered to be the minimum credential for successful entry into the labour market” (OECD, 2022, p. 3). Admission policies to the upper secondary school cycle vary across developed and developing countries, yet some similarities concerning the characteristics of the educational environment could be observed for this level: students in private school perform better in science compared to students in public schools (OECD, 2016, p. 39); there is a weak correlation between prior academic performance and high school students' performance in science, after controlling for the socio-economic background (OECD 2016, p.42); there is a strong correlation between the number of years spent in pre-primary school and the score in PISA tests in high school (OECD 2016, p.44).

Law no. 1/2011 of the National Education in Romania, article 74, paragraph 5, states that all pupils must attend a mandatory national evaluation exam at the end of the 8th grade (last grade of the lower secondary school cycle). The score obtained in this mandatory evaluation constitutes the admission score for accessing the upper secondary school cycle with the exception of vocational, artistic, sports, theological and military schools (see the Order of the Ministry of Education no. 5243/2022, annex 2). According to the same source, after the National Evaluation Exam, each pupil must state the options for its targeted schools; if the pupil was not admitted to any of these schools in the first distribution round in July, he/she will enter the second distribution round in August (see the Order of the Ministry of Education no. 5243/2022, annex 1). After intense debates over how the admission in the upper secondary school cycle should be performed, the Law 198/July 4th 2023 of National Education (entering into force from the school year 2023-2024), states that high schools

may organise a separate admission exam for at most 50% of the available seats (article 101, paragraph 2).

After the National Examination Exam in 2022-2023 school year, approximately 47% of the total candidates were admitted to their first's choice high school, while 1.44% were not admitted to any school, due to the insufficient number of options stated (Ministry of Education, 2023). However, students and parents often claim that the cause is the lack of counselling and orientation from schools' representatives, sometimes resulting in not being admitted in the second round either (see for example Nicolescu 2023).

This paper aims to answer two research questions regarding the pupils who were not assigned to an upper-secondary educational facility in the first round but have a passing final admission score (above 5):

- Q1. How many of them decided to compete in another county than their residential county?
- Q2. What are the similarities and differences between these pupils in terms of their performance at the National Exam and average score in the lower-secondary educational cycle?

## 2. Literature review

High school admission can be studied from a variety of perspectives. First, regardless the chosen criteria for admission there are various implications for the pupils, parents and society. Second, the criteria themselves may be analysed with respect to different phenomena, such as discrimination. Third, an emerging literature focuses on pupils' perspective on the admission process.

Scientific literature focuses, first and foremost on the implications of the admission criteria for the academic path of pupils. For example, Dustan et al. (2017 p.797) point out that pupils admitted to elite high schools are more likely to drop out in comparison to their non-elite peers either because of the extremely high standards in teaching or because of the long distance to the school; this is a particular issue for pupils with poor academic background. Furthermore, de Janvry (2012 p.1) emphasize that poor educational background of the parents or living in poverty are significant predictors for early leaving high school, when controlling for score in entrance exams. On the other hand, attending an elite high school increases the chances for a student to attend an elite university (Berkowitz and Hoekstra, 2011 p. 287). According to Espenshade et al. (2005 p. 276), attending an elite school increases the odds for a candidate to attend an elite university by 34%. Tam and Sukhame (2004, p.12) argue that the college admission process should control for the prestige of the applicant's high school. Attending a high school that offers advanced courses and the opportunity of extracurricular activities also plays a major role when acceding to university (Kretchmar and Farmer, 2013, p.33). Often, a student's family puts considerable effort in ensuring access to best schools, as “elite high schools are stepping stones to elite universities” Han et al (2021, p.115). The authors point out that moving into districts with good schools leads to a significant increase of house prices.

A vast body of scientific literature regarding high school admissions is dedicated to analysing admission criteria with respect to discrimination. Consolo (2019 p. 1244) proposes a composite score based on the entrance exam score, GPA, rank in 8th grade graduating class, rank within the district and diversity. However, Barrow et al (2018 p. 1) concluded that the “selective enrolment high school system” based on the application score and socio-economic background proved to be ineffective in Chicago as “75 percent of Chicago Public Schools (CPS) ninth-graders opted out of their assigned high school”.

Various other admission policies and criteria were proposed. For example, Corcoran and Baker-Smith (2018, p. 259, 276) considered that state test scores and course grades in lower secondary educational cycle may be an alternative to “specialised high-school admission tests”, yet would not produce significant changes in the demographic composition of elite high schools. Also, Rizan et al. (2020 p. 1) propose a dashboard comprising of scores in mathematics, maternal language and science, grades during lower secondary school cycle, academic certificates and zoning. Regardless of the admission criteria, transparent admission standards are proved to increase students' motivation in their academic pursuit (Keller et al., 2022 p. 342).

Pupils’ perspective might offer valuable insights regarding the entire admission process in high school. Liu (2015 p. 76) points out that students have a positive attitude towards an open admission system based on “excess application sequencing score”. According to the same source, this score includes service learning, a combination of community service and learning.

### 3. Research methodology

For the purpose of this paper data was gathered from <http://admitere.edu.ro/> on July 22nd 2023. All pupils who obtained a score above 5 for the final admission score were considered. Next, a graphical analysis is used in order to evaluate the number of pupils who competed in a different county than their county of origin, by county of origin.

In order to answer the second research questions, a cluster analysis is performed as it is most widely used to assess similarities and differences between individual cases (see Andrei et al., 2023 p.260). The following variables are included:

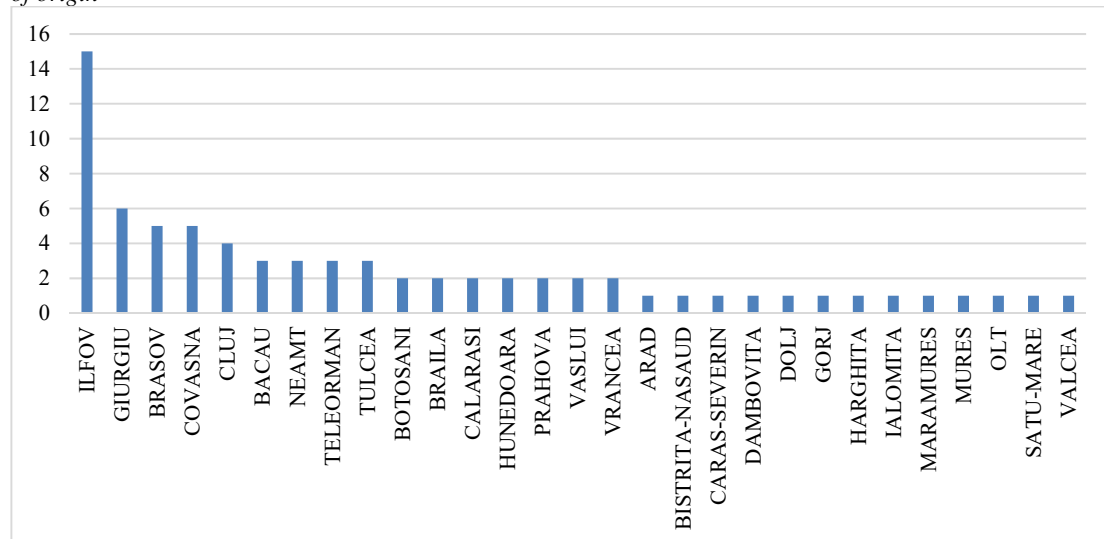
- Exam score for Romanian language;
- Exam Score for Maths;
- Average score in Lower Secondary Education;

The analysis was conducted using an R-Shiny app developed by Mizumoto (2015) with the following parameters: the Spearman rho correlation coefficient was chosen in order to avoid possible issues due to non-normality in the data (Bishara et al., 2015 p.785).

### 4. Findings

Figure 1 shows the number of pupils who competed for a place in the upper secondary education in a different county than their county of origin, by county of origin. Most of them come from Ilfov, the area surrounding Bucharest, the capital. In Arad, Bistrita-Nasaud, Caras-Severin, Dambovita, Dolj, Gorj, Harghita, Maramures, Mures, Olt, Satu-Mare and Valcea, only one pupil respectively decided to compete in another county than the county of their origin.

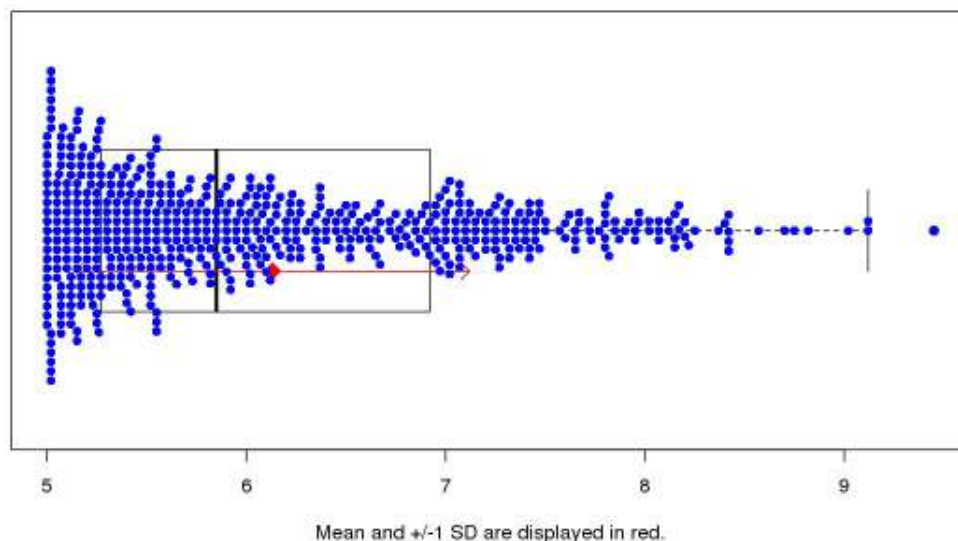
Figure no. 1. Number of pupils who competed in a different county than their county of origin, by county of origin



Source: Designed by the authors

Figure 2 presents the final admission score for all pupils who were not assigned to an upper-secondary educational facility but obtained a passing score in the admission contest. Most of these pupils registered a score between 5 and 6. One outlier can be observed above 9.

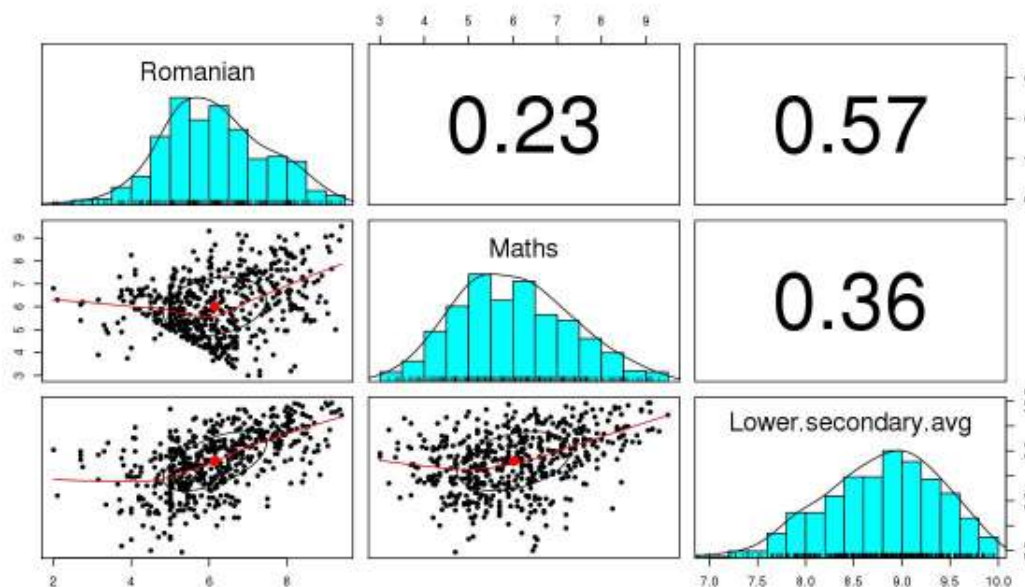
Figure no. 2. Box-Plot Final Admission Score for all pupils who were not assigned to an upper-secondary educational facility but passed the exam



Source: Designed by the authors using <https://langtest.jp/shiny/bs/>

Figure 3 shows the scatterplot matrices and the correlation coefficients between the analysed variables (Exam score in Romanian, Exam score in Maths and the Average in Lower Secondary Education). A moderate positive correlation occurs between the Exam score in Romanian and the Average in Lower Secondary Education and a relatively weak correlation between the other pairs of variables.

Figure no. 3. Scatterplot matrices (based on Spearman's rho)



Source: designed by the authors using <https://langtest.jp/shiny/cluster/>

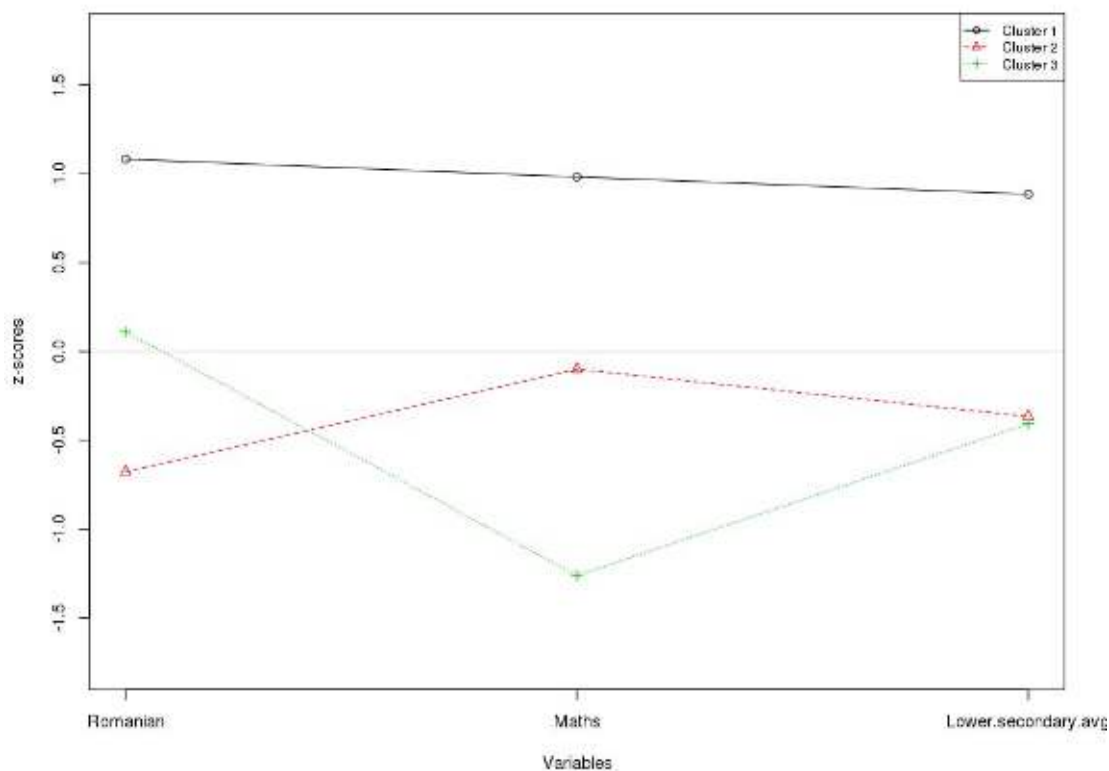
Next, cluster statistics are presented. Table 1 presents the descriptive statistics by cluster group and figure 4 presents the profile plot for each cluster. Most of the cases were included in group 2 (283), 166 cases were included in group 1 and 107 cases were included in group 3. The first cluster is characterised by relatively high scores in Romanian and Maths and very high average in lower secondary education. The second cluster contains cases with a low performance in the Romanian exam, a relatively good performance in the Maths exam and a high average in lower secondary education. Pupils in the third cluster have very low performance in the Maths exam, a relatively good performance in the Romanian exam and a high average in lower secondary education.

Table no. 1 Descriptive statistics by group

	n	mean	sd	min	max	skew	kurtosis
<b>Group 1</b>							
Romanian	166	7.58	0.86	5.60	9.40	-0.12	-0.68
Maths	166	7.28	0.99	4.95	9.50	-0.06	-0.57
Lower secondary average	166	9.32	0.36	8.04	9.96	-0.54	0.48
<b>Group 2</b>							
Romanian	283	5.25	0.93	2.0	7.95	-0.24	1.12
Maths	283	5.89	0.77	3.75	8.25	0.30	-0.18
Lower secondary average	283	8.58	0.52	6.97	9.84	-0.46	0.21
<b>Group 3</b>							
Romanian	107	6.29	0.57	5.0	8.2	0.61	1.07
Maths	107	4.41	0.55	3.0	5.40	-0.38	-0.21
Lower secondary average	107	8.55	0.55	7.5	9.67	0.13	-0.95

Source: Designed by the authors using <https://langtest.jp/shiny/cluster/>

Figure no. 4. Profile plot (standardized, ward linkage method, squared Euclidean distance)



Source: designed by the authors using <https://langtest.jp/shiny/cluster/>

## 5. Conclusions

The present paper sought to answer two fundamental research questions regarding pupils who possessed passing final admission scores but were not initially assigned to an upper-secondary educational facility. These questions explored whether the students chose to compete for admission in a different county than their residential county and both similarities and differences in their performance at the National Exam and their average scores in the lower-secondary educational cycle.

The research revised in this paper highlights the multi-layered implications of high school admission criteria. The academic path of pupils is significantly influenced by the type of high school they attend. Joining elite high schools can increase the chances of entering elite universities, creating a considerable academic advantage. Contrarywise, it was noted that pupils admitted to elite high schools may face challenges, as well as a higher risk of dropping out, particularly if they come from a weaker academic background. Another key aspect explored in the literature review is the matter of discrimination in admission criteria. Various policies and standards have been proposed to address this concern, such as considering state test scores, course grades, and socioeconomic backgrounds. Having transparent admission standards is vital for keeping students' motivation in their academic pursuits.

The empirical findings of this study reveal thought-provoking insights. First, it was observed that a significant number of pupils from various counties chose to compete for admission in a different county than their county of origin. Ilfov, the area surrounding Bucharest, had the highest number of such pupils, suggesting that urban-rural dynamics could be further investigated.

Second, the final admission grades for pupils who were not initially assigned to an upper-secondary educational facility, yet obtained a passing score in the admission contest were diverse, with most falling between 5 and 6. These scores are indicative of the competitiveness of the admission procedure.

It is important to note that the present study has some limitations. The data was gathered from a specific source, and the analysis was based on a specific set of variables. Consequently, the results may not be generalizable to all high school admissions frameworks. Future research could explore additional factors that influence pupils' choices to compete in another county and also further explore the characteristics of different clusters of pupils.

Overall, this research provides valuable insights into the dynamics of high school admissions and the experiences of pupils who were not assigned to their first-choice high school. The conclusions can advise policymakers and educators in developing strategies to improve the admission process and offer support to pupils who face challenges in accessing their chosen educational facilities.

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