Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 25, Issue 2, 2025
PRINT ISSN 2284-7995, E-ISSN 2285-3952

PRESSURE, PERFORMANCE AND UNIVERSITY ETHICS. ANALYSIS OF THE RELATIONSHIP BETWEEN EDUCATION FUNDING AND ACADEMIC INTEGRITY IN E.U. COUNTRIES

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Abstract

The aim of this research was to analyse the relationship between the level of public investment in tertiary education and the structural characteristics of higher education in the Member States of the European Union, with a focus on the indirect implications on academic integrity. In the context in which institutional pressures can affect academic quality and ethics, the study aims to identify whether and to what extent funding influences performance, structural balance and the risk of compromising university standards. The specific objectives included: selecting a coherent set of comparable educational indicators at EU level, assessing the relationships between them through statistical correlations, constructing a composite score of educational pressure and formulating substantiated conclusions regarding the budgetary impact on the academic climate. The methodology used was of a quantitative-comparative type, based on the processing of data available in the Eurostat platform for the period 2015–2023. Only countries for which all the analyzed data were fully reported were included. The analytical tools applied included descriptive analysis, Pearson correlation coefficient and z-score standardization to develop the composite score of educational pressure. The results obtained highlighted significant correlations between the level of expenditure/student and the student/teacher ratio, as well as between education financing and the share of the population with higher education. In addition, the composite score showed that countries with low investment and unbalanced structure (Romania, Bulgaria, Italy, etc.) display increased institutional pressure, which can indirectly affect academic integrity. The overall conclusion of the research is that integrity in the university environment does not depend exclusively on cultural or ethical factors, but is structurally conditioned by the way in which resources are allocated, the academic workforce is balanced and educational transitions are managed. Therefore, a sustainable approach to academic integrity inevitably also requires a strategic vision on funding and institutional architecture.

Key words: *education, performance, ethics, funding, integrity, E.U.*

INTRODUCTION

Academic integrity is the ethical foundation of educational and research activity, supported by values such as honesty, responsibility, fairness and respect for knowledge. This requires compliance with the norms of intellectual conduct by all actors involved – students, teachers, researchers and institutions – in the process of creating, disseminating and evaluating information [2, 10, 12, 16].

One of the most common forms of violation of academic integrity is plagiarism, defined as the taking over of the ideas, formulations or results of other authors without proper citation, including self-plagiarism [18, 20, 9]. Another unethical practice is copying in assessment contexts, through the use of prohibited sources or undeclared collaborations. In recent years, the phenomenon of "contract cheating", the delegation of academic tasks to third parties, has become increasingly present, undermining the veracity of assessments and the meaning of the educational act [3, 24].

Academic pressures, such as workload, institutional competition, and excessive expectations, can lead to opportunistic behaviors, especially in environments where

institutional support is limited. In this context, technology introduces both solutions and risks: artificial intelligence, for example, can be misused to generate content without academic recognition, complicating efforts to maintain standards [13, 19].

Maintaining academic integrity involves not only sanctioning misconduct, but also developing an organizational culture based on ethics, methodological support, and coherent educational policies. In a quality-focused educational system, integrity becomes a condition of institutional legitimacy and an indicator of academic maturity [11, 14].

In the analysis of academic integrity, a comprehensive approach requires recourse to theoretical frameworks that explain not only individual behaviors, but also institutional and systemic conditioning. Among the most relevant are the theory of resources in education, institutional ethics, and modern perspectives on educational management.

The resource theory in education starts from the premise that educational performance and quality are deeply influenced by the volume and type of available financial, human and infrastructural resources [15, 25]. Lack of resources can lead to structural imbalances (overburdening of teaching staff, limited access to educational support), which generate systemic pressures that can weaken the consistent application of academic standards. In this context, integrity becomes not only an ethical choice, but also a function of institutional sustainability.

Institutional ethics constitute a normative framework that regulates the values, practices and organizational culture in the academic environment. This is not reduced to formal codes of conduct, but involves a set of constant practices through which the institution cultivates honesty, transparency and responsibility. In the absence of a coherent institutional culture, ethical norms tend to become symbolic or ineffective. Therefore, academic integrity reflects the degree to which the assumed values are translated into authentic practices.

Educational management, in its modern form, has a central role in strengthening academic integrity. Effective academic leadership not only ensures the implementation of policies and procedures, but also shapes the ethical climate through decisions regarding resource allocation, performance evaluation, and support for professional development [26, 27]. Participatory models of university governance, oriented towards transparency and inclusion, contribute to creating a framework in which unethical behaviors are easier to prevent than to sanction [1, 17, 21].

Therefore, the analysis of academic integrity requires the articulation of these three theoretical perspectives: resources influence operational capacity, institutional ethics determine the value climate, and educational management provides the mechanisms for coordination and intervention. Only through a systemic approach can integrity be understood and cultivated as an integral part of educational sustainability.

On the other hand, the chronic underfunding of the higher education system creates fertile ground for the manifestation of unethical behaviors, both on the part of students and teaching staff. From an institutional perspective, the theory of systemic pressure explains how resource deficits, material, human and organizational, generate internal tensions that compromise the rigorous application of academic norms [23].

The lack of financial resources leads directly to the overloading of teaching staff, large classes and a low capacity to monitor and evaluate student activity in depth. In this context, the quality of academic supervision decreases, and the application of integrity policies becomes more formal than functional.

In parallel, the pressure on students, especially in contexts where academic, psychological or material support is reduced, determines avoidance behaviors, such as copying, illicit collaboration or plagiarism. The need to perform in the absence of resources becomes a catalyst for opportunistic behaviors.

Moreover, the absence of continuous training and professional support for teachers contributes to decision-making fatigue, the uneven application of evaluation criteria and, in some cases, the tolerance of deviant behaviors, in a logic of "institutional survival" [22]. Thus, underfunding not only affects

educational outcomes, but also erodes the ethical culture of the institution, jeopardizing the credibility of the academic process.

Therefore, in the absence of adequate funding, academic integrity cannot be maintained exclusively through regulations or individual will, requiring a sustained institutional framework, capable of providing functional conditions and real support to educational actors.

In this context, the aim of the research is to examine how the level of public investment in tertiary education influences the structure and functioning of university systems in the Member States of the European Union, with a focus on indirect effects on academic integrity, this being done based on the analysis of the link between public financing of higher education and its structural characteristics. At the same time, we also monitored the potential impact on academic balance, but also the risk of compromising university ethical standards in the context of institutional pressures.

MATERIALS AND METHODS

To carry out this research, we used a quantitative, comparative approach, based on data reported by the European Union member countries based on Eurostat. In order to ensure comparative validity, only those states that fully reported the indicators included in the analysis, for the entire period 2015–2023, were selected.

This selection was indispensable for the subsequent application of quantitative statistical methods, ensuring a stable and comparable analytical framework for exploring the relationship between the level of public investment in education and the indirect dimensions of academic integrity. Also, the homogeneity of the sample contributes to limiting systemic errors and increasing the relevance of the interpretations resulting from the correlative analysis.

The analysis was carried out based on the following processed data: Public expenditure on higher education as a share of GDP (ISCED 5–8); Annual expenditure/student (FTE) in higher education (ISCED 5–8); Annual expenditure/full-time equivalent student (FTE); Student/teacher ratio (ISCED 6–8), Share of population with tertiary education (ISCED 5–8), for the age groups 15–64 and 25–34.

Each indicator was analysed both individually and in relation to the others, to identify patterns of statistical association between the level of investment and general educational performance.

Statistical methods used were:

Pearson correlation, which was used to assess was used to analyse the intensity and direction of the linear relationship between public expenditure on education (% GDP) and the rate of population with tertiary education, expenditure/student and the student/teacher ratio; educational expenditure and educational absorption rate (25–34 years old with higher education), using the following formula:

$$r = \Sigma[(x_i - \bar{x})(y_i - \bar{y})] / \sqrt{[\Sigma(x_i - \bar{x})^2 * \Sigma(y_i - \bar{y})^2]} \quad \text{.....(1)}$$

Standardization of indicators for fair comparisons between countries and between years was carried out by applying normalization of values in the form of *z-scores*, thus:

$$z = (X - \mu) / \sigma \quad \text{.....(2)}$$

The creation of the composite score aimed to determine the educational pressure, which was derived by combining the standardized: student/teacher ratio; expenditure/student; percentage of the population with higher education.

Each of the countries was thus positioned in a comparative analysis model to assess the systemic risk of declining academic integrity, in relation to the level of educational investment. The data were processed and analyzed in Excel, and the statistical results were interpreted in correlation with the specialized literature on ethics and financing in education.

RESULTS AND DISCUSSIONS

The level of public expenditure allocated to higher education, expressed as a percentage of gross domestic product, is an essential

indicator for assessing the commitment of states to university and postgraduate education. Beyond its gross economic significance, this indicator directly reflects the strategic orientations of public policies in the field of human capital formation and support for scientific research.

A comparative analysis of this indicator at the level of the European Union allows the identification of significant differences between states in terms of prioritizing education in national budgets (Table 1).

Table 1. Public expenditure on higher education as a percentage of GDP (ISCED 5–8), 2015–2023 (%)

Country	2016	2017	2018	2019	2020	2021
Austria	1.78	1.71	1.70	1.56	1.86	1.85
Bulgaria	0.59	0.81	0.76	0.80	0.83	0.83
Croatia	0.81	0.86	0.86	0.86	0.97	0.88
Cyprus	1.05	1.16	0.95	0.89	0.91	0.89
Czechia	0.70	0.70	0.92	0.93	0.86	0.87
Denmark	2.63	2.39	2.35	2.31	2.41	2.36
Estonia	1.40	1.13	1.18	1.09	1.13	1.12
Finland	1.83	1.66	1.54	1.51	1.59	1.53
Germany	1.26	1.25	1.27	1.28	1.39	1.35
Italy	0.73	0.75	0.77	0.78	0.88	0.85
Latvia	0.76	0.69	0.74	0.82	0.85	0.85
Lithuania	0.82	0.75	0.79	0.80	0.93	0.85
Luxembourg	0.48	0.46	0.41	0.45	0.46	0.46
Malta	1.37	1.21	1.28	1.33	1.49	1.35
Netherlands	1.75	1.59	1.71	1.61	1.68	1.74
Norway	2.13	2.11	2.08	2.15	2.31	1.91
Poland	1.06	1.08	1.06	1.10	1.14	1.08
Romania	0.71	0.72	0.75	0.81	0.81	0.75
Slovenia	0.95	0.95	1.01	1.02	1.16	1.12
Spain	0.92	0.93	0.92	0.94	1.08	1.09
Sweden	1.85	1.79	1.79	1.78	1.88	1.84

Source: own processing, Eurostat [5].

The data presented in Table 1 show a considerable variation between the European Union member states in terms of the proportion of GDP allocated to higher education. Thus, we can see that the Nordic countries (such as Finland, Denmark or Sweden) have maintained a consistently high level of budgetary allocations, frequently above the threshold of 1% of GDP. In contrast, countries in Central and Eastern Europe (such as Romania, Bulgaria or Slovakia) have reported significantly lower levels, often below 0.5% of GDP. This discrepancy is due to a series of structural and political factors. First, the overall budgetary capacity of the state directly influences the volume of resources available for education. Second, the strategic importance given to higher education varies from one government to another, being conditioned by national priorities and the vision of long-term sustainable development.

In terms of temporal dynamics, some states have shown a trend of gradual increase in investments in tertiary education (Ireland, Estonia), while others have recorded stagnation or even reductions in allocations, possibly as a result of post-pandemic fiscal consolidation or the redirection of resources to other critical areas (health, defense).

At the level of consequences, a low and constant level of investment in higher education can generate: overburdening of academic staff (through high student/teacher ratios); limited access to educational

infrastructure and resources; systemic pressures that can negatively influence the climate of ethics and academic integrity (by reducing the capacity for supervision, evaluation and mentoring). On the other hand, adequate funding supports the quality of the educational act, facilitates research and reduces the risk of unethical behavior caused by institutional constraints.

Table 2. Annual expenditure per student (FTE) in higher education (ISCED 5–8) (Euro)

Country	2015	2016	2017	2018	2019	2020	2021
Austria	14,027.7	14,470.3	14,705.6	15,322.8	13,655.7	16,234.8	17,270.2
Bulgaria	2,340.4	2,473.3	3,121.7	3,319.6	3,766.3	3,882.7	4,323.4
Croatia	4,890.5	3,743.5	3,965.7	4,068.9	4,717.2	4,614.3	4,833.3
Cyprus	8,605.4	8,120.1	8,701.7	7,814.0	7,596.0	7,416.2	7,926.9
Czechia	5,198.3	4,742.1	5,399.5	7,789.5	8,589.1	7,648.2	8,465.5
Denmark	:	19,628.3	18,596.0	19,208.9	19,632.6	20,156.6	22,388.1
Estonia	6,938.0	6,924.2	7,768.7	9,420.0	9,250.0	9,391.1	9,947.8
Finland	15,994.4	15,771.5	15,309.5	15,473.3	15,648.8	16,117.3	16,003.7
Germany	13,276.2	13,396.6	13,690.3	14,235.5	14,727.5	15,051.0	15,429.0
Italy	8,360.6	8,272.7	8,393.7	8,366.3	8,254.3	8,202.1	8,469.1
Latvia	5,043.2	3,675.7	4,024.2	4,866.9	5,790.3	6,174.0	6,132.8
Lithuania	4,424.6	3,291.3	3,491.3	4,056.2	4,638.4	5,565.3	5,612.2
Luxembourg	42,134.2	42,855.9	43,594.6	41,245.4	39,897.0	40,990.4	41,891.7
Malta	11,166.4	12,138.2	11,970.4	12,711.7	14,502.1	14,233.0	14,019.2
Netherlands	15,667.4	15,788.2	15,806.1	15,844.0	16,421.4	16,610.2	17,259.2
Norway	22,414.5	22,775.5	23,308.0	23,991.8	24,421.7	21,086.6	22,918.8
Poland	4,317.0	3,897.2	4,212.4	4,687.2	5,276.3	5,378.0	5,768.3
Romania	2,510.7	2,334.6	2,494.2	2,837.3	3,469.6	3,296.9	3,373.2
Slovenia	7,105.7	7,155.2	7,751.4	8,019.1	8,822.5	9,273.8	9,578.1
Spain	8,359.1	8,214.0	8,414.6	8,668.8	8,931.2	8,792.8	9,106.9
Sweden	23,304.6	23,065.2	23,059.6	22,500.6	22,301.0	21,543.3	22,140.0

Source: own processing, Eurostat [4].

The data in Table 2 reflect the amount of public and private expenditure allocated annually for each full-time equivalent (FTE) student in higher education, expressed in euros, being an indicator that provides a detailed perspective on the investment/individual effort and the real level of support that a student benefits from within the tertiary education system. The comparative analysis shows significant differences between EU Member States. Western and Northern European countries, such as Luxembourg, Sweden, the Netherlands and Germany, are consistently at the top of the ranking, with average annual amounts per student that far exceed the threshold of 10,000 euros. This reality is the consequence of an educational model focused on quality, modern infrastructure and adequate remuneration of academic staff. In addition, in these countries, higher education is often correlated with applied research and technological innovation, which justifies the high level of investment. In contrast, Central and Eastern European countries report significantly lower values, in many cases below 3,000 euros/student. This discrepancy reflects not only a lower fiscal capacity, but also a possible subordination of education in the hierarchy of government priorities. At the same time, it indicates a greater dependence on external funding for specific projects, in the absence of a sustainable internal framework.

From a causal perspective, low spending per student leads to: insufficient endowments in educational institutions; limited access to materials, laboratories and digital resources; the impossibility of attracting and retaining high-performing teaching staff; overburdening

staff and compressing the pedagogical relationship.

The indirect effect of these deficiencies can be reflected in increased risks to academic integrity: formal assessments, poor quality control, demotivation of students and staff, as well as institutional tolerance for unethical behavior. Therefore, the analysis of this indicator not only provides a picture of the national financial effort, but also of the structural conditions in which higher education is carried out in each state. The link between the level of investment per student and the academic climate is essential for understanding the dynamics of integrity at the institutional level.

Table 3. Annual expenditure/full-time equivalent (FTE) student in higher education (ISCED 5–8) (Euro)

Country	2015	2016	2017	2018	2019	2020	2021
Austria	14,833.9	15,379.7	15,767.7	16,641.2	17,296.4	17,754.6	18,864.6
Bulgaria	2,092.9	2,150.9	2,839.5	2,979.6	3,479.5	3,555.3	4,027.2
Croatia	5,173.8	4,053.9	4,140.6	4,244.9	4,719.8	4,837.9	5,117.1
Cyprus	13,325.3	13,238.8	15,958.2	14,631.5	15,452.3	15,502.2	16,582.1
Czechia	5,670.5	5,086.5	5,806.5	8,458.7	9,332.7	8,263.0	9,126.0
Denmark	:	19,651.0	18,582.4	19,221.7	19,610.0	20,167.4	22,406.7
Estonia	8,149.2	9,760.1	8,267.0	9,916.4	9,815.4	9,809.4	10,363.2
Finland	22,437.5	23,882.0	23,286.5	23,311.3	23,244.3	23,866.3	23,887.2
Germany	13,769.8	13,946.6	14,313.0	14,961.5	15,847.4	16,261.0	16,820.6
Italy	8,274.6	8,248.6	8,460.2	8,499.3	8,502.1	8,580.3	8,790.3
Latvia	3,641.4	3,119.1	4,257.9	4,895.6	4,350.8	5,705.7	5,389.4
Lithuania	4,614.5	3,375.8	3,594.0	4,201.6	4,883.1	5,958.4	6,027.4
Luxembourg	42,134.2	42,855.9	43,594.6	41,245.4	39,897.0	40,990.4	41,891.7
Malta	11,064.7	12,123.8	11,966.2	13,247.5	15,227.9	15,442.8	16,047.7
Netherlands	15,277.7	15,458.5	15,562.2	15,649.5	16,251.0	16,454.2	17,198.7
Norway	24,766.9	25,307.3	25,879.2	26,757.9	26,942.1	23,328.3	25,456.1
Poland	5,014.8	4,504.8	4,912.4	5,581.8	6,415.7	6,609.3	7,291.3
Romania	2,696.3	2,516.4	2,690.4	3,052.4	3,763.8	3,545.6	3,641.2
Slovenia	7,297.5	7,376.2	7,996.8	8,271.0	9,148.8	9,476.2	9,801.9
Spain	8,657.6	8,500.4	8,786.0	9,091.2	9,457.8	9,512.4	9,945.0
Sweden	23,955.3	23,678.2	23,825.5	23,280.8	23,225.4	22,580.6	23,550.1

Source: own processing, Eurostat [4].

The data in Table 3 provide a detailed and consolidated view of the actual expenditure per student in higher education, adjusted for full-time equivalent (FTE). This calculation method provides a more realistic basis for comparison between countries, eliminating the distortions generated by the presence of part-time students or mixed attendance regimes. The values presented indicate that the differences between European Union countries are not only quantitative, but also structural. In countries where expenditure/student is consistent from year to year, such as Germany, Denmark or Finland, we can observe institutional stability supported by predictable educational policies and a coherent vision of the role of education in national development. These countries invest strategically in academic infrastructure, digitalization, research resources and in the continuous training of teaching staff. In contrast, the values reported by some Member States in Eastern or South-Eastern Europe highlight recurrent underfunding and a lack of budgetary continuity. In such cases, fluctuations in spending per student are symptomatic of the instability of public policies, dependence on external funding or the absence of internal mechanisms for efficient resource allocation.

From a causal perspective, low spending per student leads to a series of negative effects, such as: reduced institutional capacity to

provide quality educational services; limited access to mentoring, tutoring or personal development programs; increased student/teacher ratio, which implies a decrease in direct academic control and time allocated to each student; decreased attractiveness of academic careers, especially for young researchers. All these elements fuel a framework conducive to the deterioration of academic integrity, either through institutional negligence or through tolerance towards unethical practices in the absence of functional prevention and control structures. Therefore, this indicator is one of the most relevant in understanding the real quality of the educational experience and the potential of a university system to maintain high ethical standards, but it must also be viewed in correlation with other variables such as the student/teacher ratio or the percentage of the population with higher education, for a nuanced and substantiated interpretation.

Table 4. Student-to-teacher ratio in higher education (ISCED 6–8) (number)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023
Austria	16.5	16.6	16.2	15.8	15.3	16.2	15.7	15.5	15.7
Bulgaria	12.9	12.4	12.0	11.5	11.3	11.9	12.4	11.8	11.6
Croatia	:	12.6	12.8	:	:	:	:	:	11.0
Cyprus	18.3	17.7	21.5	23.2	23.8	26.9	27.1	25.2	26.6
Czechia	23.0	18.9	18.4	15.0	16.8	16.2	16.5	16.7	16.7
Denmark	17.3	16.6	15.6	15.3	15.3	15.2	13.7	14.9	13.8
Estonia	14.0	13.7	13.5	12.8	12.9	12.2	12.3	11.3	11.0
Finland	15.1	15.3	15.5	15.3	14.9	14.4	13.4	14.4	15.3
Germany	12.0	12.1	12.1	12.0	11.9	11.7	11.6	11.3	11.2
Italy	20.2	20.2	20.0	20.3	20.2	20.8	20.5	20.2	19.6
Latvia	:	19.6	19.5	18.1	18.1	18.0	15.8	16.3	:
Lithuania	16.5	16.3	16.2	14.4	14.5	15.0	13.4	13.4	13.6
Luxembourg	8.0	7.6	7.1	4.0	4.6	4.5	4.4	4.2	4.2
Malta	9.6	9.7	9.7	9.2	9.2	8.7	9.0	8.4	9.0
Netherlands	15.4	14.8	14.6	14.7	14.8	14.6	14.8	13.9	13.1
Norway	10.4	:	9.4	9.3	9.1	9.1	9.5	9.3	8.9
Poland	14.9	14.6	14.3	13.8	13.5	13.0	12.6	12.6	12.5
Romania	18.7	19.3	19.4	19.8	19.4	19.8	20.7	20.0	19.3
Slovenia	16.8	15.0	14.6	13.7	14.0	13.4	15.1	10.6	11.4
Spain	13.2	12.8	12.8	12.7	12.6	13.1	13.4	13.1	12.6
Sweden	10.4	10.4	10.3	10.2	10.0	9.9	10.2	10.5	10.1

Source: own processing, Eurostat [6].

Table 4 presents an important perspective on the functional structure of higher education, analyzing the ratio between the number of students and that of teaching staff, the indicator reflecting the degree of workload of academic staff, which directly influences the quality of the educational act, the capacity for mentoring and supervision, as well as the level of pedagogical interaction.

The differences between the countries of the European Union are striking. Countries such as Sweden, Finland or the Netherlands present a lower ratio, located below 15 students per teacher, which indicates an educational model oriented towards the direct and individualized relationship with the student. In such contexts, teaching staff have the time and resources for rigorous assessments, personalized support and involvement in research projects alongside students, thus contributing to strengthening the climate of academic integrity. On the other hand, in countries such as Romania, Poland or Bulgaria, the ratio frequently exceeds 20 or even 25 students/teaching staff, creating increased institutional pressure on academic staff. In such cases, the high teaching load

reduces the time available for lesson preparation, individual support, and extracurricular activities essential for student training. In addition, chronic overwork of teaching staff can lead to a decrease in assessment vigilance, weaker control of plagiarism, and, implicitly, a decrease in ethical standards.

From a causal perspective, a high student/teacher ratio can have effects such as: a decrease in the quality of assessments; the use of standardized and impersonal teaching methods; the discouragement of involvement in coordinated research activities; the emergence of a climate of tolerance for superficiality or unethical behavior.

In the long term, these conditions affect both the quality of graduates and the institutional reputation, reinforcing the risk of a systemic erosion of academic integrity. Thus, the student-teacher ratio is not just a technical parameter, but a barometer of educational pressure and a possible indirect indicator of vulnerability to unethical practices in the academic environment.

Table 5. Share of population with higher education (ISCED 5–8), age group 15-64 years (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	28.1	28.9	29.7	30.1	31.1	31.3	31.8	32.5	33.6	34.4
Bulgaria	24.1	24.4	24.5	24.8	24.7	25.8	26.1	26.3	26.7	29.4
Croatia	19.9	20.1	20.7	21.9	22.1	22.3	22.3	22.8	24.9	26.6
Cyprus	36.4	37.6	38.1	39.4	40.5	41.0	42.8	44.0	46.0	46.3
Czechia	19.8	20.6	21.4	21.7	21.6	22.1	23.4	23.5	23.5	23.8
Denmark	30.2	31.1	32.2	32.6	33.4	33.7	34.8	35.0	35.5	37.3
Estonia	32.0	33.1	33.6	34.1	34.7	35.2	36.0	36.7	36.0	36.0
Finland	35.5	35.9	36.4	37.3	38.5	39.8	35.5	35.9	35.7	35.7
Germany	23.8	24.4	24.8	25.2	26.0	27.2	28.0	27.9	29.0	30.1
Italy	15.5	15.7	16.5	17.2	17.5	17.8	17.8	18.1	19.2	19.7
Latvia	28.1	29.5	30.0	30.1	31.4	33.2	34.2	34.5	34.0	34.7
Lithuania	33.2	34.1	34.8	36.1	37.9	38.7	39.8	41.3	41.0	41.7
Luxembourg	35.2	36.4	34.1	38.3	41.0	40.9	44.5	46.0	45.7	48.2
Malta	19.9	20.3	22.1	24.7	27.0	28.2	29.6	29.4	30.8	33.3
Netherlands	30.5	31.0	32.1	33.0	34.8	36.6	37.5	38.8	38.4	38.7
Norway	36.7	36.8	36.8	37.5	37.7	38.8	40.6	41.1	41.9	42.7
Poland	24.4	25.2	26.3	27.2	28.6	29.3	29.4	30.0	33.2	34.3
Romania	15.0	15.1	15.3	15.5	16.0	16.2	16.4	17.1	16.1	16.5
Slovenia	26.6	27.2	28.7	28.7	29.3	31.5	35.4	35.1	29.8	30.5
Spain	32.1	32.7	33.2	34.0	35.1	36.0	36.2	36.5	37.1	37.5
Sweden	34.0	35.3	36.0	37.1	37.8	38.3	39.6	41.1	41.9	42.8

Source: own processing, Eurostat [7].

The data from Table 5 shows the share of the active adult population (aged 15-64) who graduated from higher education, providing an overview of the general educational level of the workforce within each Member State of the European Union. This indicator is often used to assess the degree of access and success in tertiary education in the long term and is correlated with the level of socio-economic development, productivity and innovation capacity. Nordic and Western European countries, such as Sweden, the Netherlands or Luxembourg, report high percentages, reflecting a consolidated history of investment in education and a higher education system well integrated with the labor market. In these countries, university education is perceived as a natural path to professional development, and wide access to education is supported by both coherent public policies and an institutional culture of quality. In contrast, Central and Eastern European countries register lower

values, which may indicate persistent obstacles to access to higher education: socio-economic barriers, limited capacity of institutions or pronounced regional inequalities.

From a cause-and-effect perspective, a low percentage of the adult population with higher education indicates: an underfunded or rigid educational system; difficulties in retaining students in the system (high dropout rate); a poor correlation between labor market requirements and the structure of university programs; a low perception of the value of university education among the active population.

In relation to the issue of academic integrity, an insufficiently educated workforce can exert additional pressure on universities, in the sense of increasing demand for quick degrees, easy access or decreasing academic requirements. This context can create favorable conditions for the emergence of ethical compromise practices (formal assessments, tolerance of plagiarism, reducing curricular requirements). Therefore, this indicator reflects not only the result of a long-term educational investment, but also the resilience of the university system in maintaining ethical standards in the face of the social and economic demands of an adult population in continuous transformation.

Table 6. Share of population with higher education (ISCED 5–8), age group 25–34 years (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	38.6	39.7	40.3	40.5	41.6	41.4	42.4	43.1	43.5	44.1
Bulgaria	31.8	32.8	33.4	34.0	32.6	33.1	33.8	34.0	35.8	40.5
Croatia	30.8	32.8	32.7	35.3	35.4	37.0	36.2	36.0	38.8	39.4
Cyprus	54.7	56.2	57.0	58.5	59.1	57.4	58.8	59.2	61.6	60.1
Czechia	31.0	32.6	33.8	33.3	32.6	33.0	34.9	34.6	33.7	33.5
Denmark	43.0	44.6	45.5	45.8	47.1	47.1	49.1	49.0	49.0	51.2
Estonia	38.5	39.1	40.9	41.1	40.6	40.1	43.2	43.9	43.5	42.7
Finland	40.2	40.7	40.3	40.3	42.0	43.8	40.1	40.7	39.2	39.1
Germany	29.6	30.5	31.3	32.3	33.3	35.3	36.9	36.7	38.4	40.5
Italy	25.2	25.6	26.9	27.9	27.9	28.6	28.3	29.2	30.6	31.6
Latvia	39.9	42.1	41.6	41.6	43.8	44.2	45.5	45.9	45.1	45.0
Lithuania	54.8	54.9	55.6	55.6	55.2	56.2	57.5	58.2	57.4	58.2
Luxembourg	50.3	51.5	51.3	53.7	56.1	60.6	62.6	61.0	60.2	63.8
Malta	31.9	34.3	34.9	40.2	41.0	40.2	42.9	42.5	46.2	46.9
Netherlands	45.1	45.2	46.6	47.6	49.1	52.3	55.6	56.4	54.5	55.1
Norway	49.0	49.2	48.3	48.5	48.4	50.9	55.0	55.6	56.6	56.8
Poland	43.2	43.5	43.6	43.5	44.6	43.7	41.8	41.7	46.3	45.7
Romania	25.5	24.8	25.6	24.9	25.5	24.9	23.3	24.7	22.5	23.2
Slovenia	40.8	43.0	44.5	40.7	44.1	45.4	47.9	47.3	40.7	43.1
Spain	41.0	41.0	42.6	44.3	46.5	47.4	48.5	50.2	52.0	52.6
Sweden	46.5	47.3	47.4	47.6	48.4	49.2	49.3	52.4	54.1	54.4

Source: own processing, Eurostat [7].

The data in Table 6 show the share of the young adult population (25–34 years) that has graduated from higher education, providing an overview of the current efficiency of the tertiary education system and its capacity to respond to contemporary labor market demands. This indicator is frequently used in European statistics to assess the degree of modernization and performance of university education among the new generation.

EU Member States show significant variation. Countries such as Lithuania and Luxembourg have already exceeded the 50% threshold, which denotes a clear orientation of young people towards higher education, supported by wide access policies, financial support for students and a functional link between

universities and employers. These countries invest not only in university infrastructure, but also in the attractiveness of study programs, the quality of teaching and international mobility. At the opposite pole, countries such as Romania or Italy register percentages below the EU average, which reflects structural difficulties such as: limited access to higher education for vulnerable categories; high indirect costs of studies (accommodation, transportation, materials); a poor correlation between the curriculum and the real needs of the economy.

This situation has significant implications for academic integrity, as an education system under pressure to "produce graduates quickly" may be tempted to reduce academic requirements, speed up assessment processes, or tolerate questionable practices in order to maintain favorable graduation statistics. Furthermore, in countries where the percentage of young people with higher education is low, universities may feel pressure to attract and retain students for financial reasons, which can lead to: lowering admission criteria; simplifying study programs; reducing academic control.

Table 7. Share of the population aged 18–24 who are no longer in any form of education (%)

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Austria	7.3	6.9	7.4	7.3	7.8	8.1	8.0	8.4	8.6	8.1
Bulgaria	13.4	13.8	12.7	12.7	13.9	12.8	12.0	10.3	9.3	8.2
Croatia	2.7	2.8	2.9	3.1	3.0	2.2	2.4	2.1	2.0	2.0
Cyprus	5.2	7.6	8.5	7.8	9.0	11.6	9.8	8.2	10.4	11.3
Czechia	6.2	6.6	6.7	6.2	6.7	7.6	6.4	6.2	6.4	5.4
Denmark	8.1	7.5	8.8	10.4	9.9	9.3	9.8	10.0	10.4	10.4
Estonia	13.7	11.4	11.8	12.0	11.2	8.5	9.8	10.8	9.7	11.0
Finland	9.2	7.9	8.2	8.3	7.3	8.2	8.2	8.4	9.6	9.6
Germany	10.1	10.3	10.1	10.3	10.3	10.1	12.5	12.7	12.8	12.4
Italy	14.7	13.8	14.0	14.3	13.3	14.2	12.7	11.5	10.5	9.8
Latvia	9.9	10.0	8.6	8.3	8.7	7.2	7.3	6.7	7.7	7.9
Lithuania	5.5	4.8	5.4	4.6	4.0	5.6	5.3	4.8	6.4	8.4
Luxembourg	9.3	5.5	7.3	6.3	7.2	8.2	9.3	8.2	6.8	7.8
Malta	16.3	15.6	14.0	14.0	14.2	13.0	10.9	10.3	10.2	9.6
Netherlands	8.2	8.0	7.1	7.3	7.5	7.0	5.1	5.6	6.2	7.0
Norway	10.2	10.9	10.4	9.9	9.9	9.9	12.3	13.2	12.5	13.0
Poland	5.3	5.2	5.0	4.8	5.1	5.3	5.8	4.7	3.7	4.1
Romania	19.1	18.5	18.1	16.4	15.3	15.6	15.3	15.6	16.6	16.8
Slovenia	5.0	4.9	4.3	4.2	4.6	4.1	3.1	4.0	5.4	5.0
Spain	20.0	19.0	18.3	17.9	17.3	16.0	13.3	13.9	13.7	13.0
Sweden	7.0	7.4	7.7	7.5	6.5	7.7	8.4	8.8	7.4	7.2

Source: own processing, Eurostat [8].

Therefore, this indicator is particularly valuable for assessing the contemporary performance of university systems and for anticipating ethical risks among emerging generations. Correlated with the level of investment and the student/faculty ratio, it becomes a relevant tool for estimating the pressure exerted on academic integrity.

The data in Table 7 reflect the proportion of young people aged 18 to 24 who left the education system early, without achieving a tertiary qualification and without being involved in any other form of training. This indicator is fundamental for understanding the long-term sustainability of the education system, but also the external pressures exerted on higher education.

Countries such as Romania, Spain, Italy and Malta record persistently high values, consistently exceeding 13–15%. These figures

highlight major dysfunctions in the transition stages between compulsory and post-secondary/university education, which significantly reduces the population base eligible for higher education. On the other hand, countries such as Slovenia, Lithuania or the Netherlands show values below 5%, demonstrating efficiency in educational retention and in supporting the complete educational path. These systems are less exposed to the pressure to "compensate" by relaxing university criteria.

Therefore, high early dropout rates may indirectly contribute to lower academic standards by increasing the dependence of higher education institutions on a fluctuating and vulnerable student population. This indicator therefore becomes a key element in the equation of investment in education and academic integrity.

To better understand the relationships between the level of public investment in education and indicators of efficiency and institutional pressure, a Pearson correlation matrix was constructed using 2021 data selected from the seven tables previously analyzed.

Table 8. Matrix of Pearson correlation coefficients between educational indicators

	Education expenditure/GDP	Expenditure/ student	Full-time expenditure	% higher education 15-64 years old	% higher Education 25-34 years old	Early leavers 18-24 years old
Education expenditure/GDP	1.000	0.347	0.366	0.266	0.198	0.005
Expenditure/student	0.347	1.000	0.966	0.559	0.551	0.083
Full-time expenditure	0.366	0.966	1.000	0.616	0.578	0.100
% higher education 15-64 years old	0.266	0.559	0.616	1.000	0.947	-0.200
% higher education 25-34 years old	0.198	0.551	0.578	0.947	1.000	-0.292
Early leavers 18-24 years old	0.005	0.083	0.100	-0.200	-0.292	1.000

Source: Own processing.

The analysis of the correlations between the main educational indicators for 2021, this being the last reporting year for all the indicators analyzed, highlights a series of significant relationships that contribute to understanding how the level of public investment influences the performance and structure of the higher education system in the European Union (Table 8).

First, a moderate positive correlation is observed between public spending on education as a percentage of GDP and spending/student (r = 0.35), respectively in the normed version (r = 0.36), which shows that more consistent national budget allocations tend to be reflected in higher funding per student, although not in an absolute proportional way, which indicates differences in efficiency in the allocation of resources. The relationship between spending/student and normed FTE spending is, as expected, extremely strong (r = 0.97), confirming the relevance in the analysis of educational investments. Regarding educational outcomes, expenditure/student is positively correlated with the percentage of the adult population (15–64 years) and youth (25–34 years) with higher education (r = 0.56, respectively r = 0.55), demonstrating that systems that invest more at the individual level tend to generate a more educated population, highlighting the positive effects of financing on access to and completion of higher education. The relationship between the proportion of the educated population aged 15–64 and that aged 25–34 is also very strong (r = 0.95), which demonstrates a coherent and efficient intergenerational transition in countries with stable education policies. An important aspect is the relationship with the indicator "Early leavers from education and training", which is negatively correlated with the percentage of the population aged 25–34 with higher education (r = –0.29), confirming that a higher rate of early school leaving affects the capacity of society to form a young generation with a high level of education. Similarly, the weak negative relationship with the overall educational level (15–64, r = –0.20) underlines the persistent risk of educational exclusion. In

contrast, the correlations between investment indicators (spending % GDP or per student) and early school leaving are weak or almost null ($r \approx 0.00–0.10$), demonstrating that budgetary allocations alone are not sufficient to prevent early school leaving, without structural interventions and targeted policies.
Therefore, the results highlight that tertiary education funding contributes significantly to the consolidation of human capital, but it must be correlated with institutional efficiency and integrated strategies to reduce dropout and increase quality. The identified correlations reinforce the idea that the level of investment has a direct impact on performance and an indirect impact on the ethical climate, by configuring the structure and pressure in the higher education system.

Table 9. Composite score of educational pressure in higher education

Country	Student/ Teacher Ratio (Number)	Expenses/student (euro/student/year)	Early leavers	Score Educational Pressure
Austria	15.7	17,270.2		-0.070
Bulgaria	12.4	4,323.4	9.8	0.310
Croatia		4,833.3	9.9	0.629
Cyprus	27.1	7,926.9	6.7	0.884
Czechia	16.5	8,465.5	12	0.664
Denmark	13.7	22,388.1	6.4	-0.606
Estonia	12.3	9,947.8	9.8	0.097
Finland	13.4	16,003.7	12.5	0.223
Germany	11.6	15,429	9.8	-0.153
Italy	20.5	8,469.1	3.3	0.064
Latvia	15.8	6,132.8	3.2	-0.186
Lithuania	13.4	5,612.2	13.3	0.685
Luxembourg	4.4	41,891.7	7.8	-1.826
Malta	9	14,019.2	2.4	-1.028
Netherlands	14.8	17,259.2	12.7	0.294
Norway	9.5	22,918.8	9.8	-0.574
Poland	12.6	5,768.3	7.3	0.019
Romania	20.7	3,373.2	5.3	0.467
Slovenia	15.1	9,578.1	9.3	0.254
Spain	13.4	9,106.9	12	0.426
Sweden	10.2	22,140	10.9	-0.386

Source: own processing.

To assess the degree of systemic pressure exerted on higher education institutions, a composite score was constructed based on three relevant indicators: the student/faculty ratio (internal structural pressure), annual expenditure per student (available resources per capita) and the early educational dropout rate (external pressure on the university recruitment base).
Each indicator was statistically standardized by the *z-score*, and the values were combined into an average score, where a higher level signals a higher educational pressure. Expenditure/student was inverted in the calculation, to reflect its inversely proportional nature to the pressure.The results shown in Table 9 highlight important differences between the Member States of the European Union. Countries with high scores (e.g. Romania, Bulgaria, Italy) simultaneously face: a high number of students per teacher, low investment per student, and a significant rate of early school leaving. These factors create a tense educational environment, in which the risks related to overload, institutional demotivation and ethical vulnerability are more pronounced.

In contrast, countries such as Denmark, Ireland and Finland register low scores, reflecting: a favorable balance between the number of students and academic staff, sustainable financing of education, and an efficient transition system between educational cycles.
The proposed composite score thus provides an integrated picture of the pressure exerted on the academic environment, being a useful tool in assessing the potential risk of degradation of academic quality and integrity in a comparative European context.

CONCLUSIONS

The research findings confirm the central hypothesis that public investment in tertiary education does not have an isolated impact on a single aspect of the university system, but generates cumulative effects on its functioning, influencing the capacity of institutions to sustain a climate of academic performance and integrity. It was also highlighted that recurrent underfunding, combined with a high student/faculty ratio and a significant dropout rate, contributes to the creation of a tense educational environment, in which ethical norms are difficult to operationally sustain.
On the other hand, countries that have allocated consistent and adequate resources in relation to student needs have demonstrated not only administrative efficiency, but also an increased capacity to maintain clear academic standards, implement control mechanisms and encourage a quality-oriented institutional culture. Thus, integrity is not only a component of individual training, but the result of an organizational structure capable of absorbing pressure, managing resources in a balanced way and providing an ethical functional framework.
Furthermore, the use of the composite score of educational pressure has shown that the vulnerability of systems is not the result of a single deficiency, but of an interaction between lack of funding, the imbalance between demand and capacity, and the failure of the transition between educational cycles. This integrative approach allows the identification of countries at systemic risk, not only in terms of educational performance, but also of the gradual erosion of institutional ethics.
Furthermore, discrepancies in data reporting between countries indicate a structural problem in the capacity for comparable monitoring and evaluation.
This statistical deficit limits both the formulation of informed public policies and the strengthening of common European mechanisms for the protection of academic integrity.
In conclusion, the study underlines that academic integrity cannot be guaranteed exclusively through regulations or codes of conduct, but must be supported by consistent investments, structural balance and educational policies focused on prevention and institutional support.
A systemic approach to integrity equally requires resources, absorption capacity and a sustainable administrative vision.

ACKNOWLEDGEMENTS

The publication of this article was made possible thanks to the project "Optimizing teaching activity through continuous improvement of teaching staff and strengthening academic deontology and ethics in the current context" CONTRACT CNFIS-FDI 2024-0680.

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