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BRIDGING GLOBAL AND EUROPEAN AGENDAS: AN EVALUATION OF PROGRESS ON SDG 4 AND THE EUROPE 2020 STRATEGY*

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Abstract. This paper evaluates the progress of the European Union in meeting the educational objectives defined by the Europe 2020 strategy and the 2030 Agenda for Sustainable Development, with a particular focus on Sustainable Development Goal 4 (SDG 4). The analysis concentrates on two key indicators: the share of individuals leaving education and training early and the proportion of the population with completed tertiary education. Using Eurostat data, the study first assesses the achievement of national targets by EU member states up to 2020 and then compares these outcomes with the 2030 targets. The research applies descriptive statistical methods complemented by regression analysis to estimate future developments up to 2030. Results confirm that while the EU as a whole already surpassed the 2020 benchmark for early school leavers, persistent disparities remain across member countries. The regression findings suggest that, assuming current trends continue, the EU is likely to reduce early school leaving below 9% by 2026. In parallel, the 45% target for tertiary education attainment could be achieved by 2027. However, country-specific gaps reveal uneven progress, particularly in Romania, Spain, and Germany, while states such as Greece, Croatia, Ireland, and Luxembourg demonstrate strong performance. The results highlight the central role of education as both a driver and a consequence of sustainable economic growth, labor market competitiveness, and social cohesion. At the same time, they underscore the importance of consistent policy efforts across member states to address structural inequalities and ensure convergence toward the 2030 Agenda goals.

Keywords: sustainable development; Europe 2020; SDG 4; early leavers from education; tertiary education

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1. Introduction

Education is a key pillar of sustainable development and social progress. Within the framework of the 2030 Agenda for Sustainable Development, this dimension is addressed in Sustainable Development Goal 4 (SDG 4), which emphasizes the need to ensure inclusive and equitable quality education and to promote lifelong learning opportunities for all (United Nations, 2015). This target reflects the close link between the educational attainment of the population, economic competitiveness, and social cohesion.

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In the European context, SDG 4 builds on the priorities expressed in the Europe 2020 strategy (European Commission, 2010), which aimed to promote smart, sustainable, and inclusive growth. One of the key indicators in this strategy was the reduction of the share of people leaving education and training early, as well as the increase in the share of the population with completed tertiary education. These measures were intended to strengthen human capital, increase employability, and reduce the risk of social exclusion.

The link between the global goals of the 2030 Agenda and European policy thus points to the long-term importance of investing in education, which is not only an individual right but also a fundamental prerequisite for economic and social development.

The main aim of this paper is, therefore, to evaluate and analyze the progress in fulfilling the educational targets within the European Union, as defined by the Europe 2020 strategy and further developed in the 2030 Agenda for Sustainable Development (SDG 4), and to project the possible future development of the monitored indicators up to 2030.

2. Theoretical background

The interconnection between the global agenda for sustainable development and the European Union's education strategies represents a key framework for assessing progress toward Sustainable Development Goal 4 (SDG 4) – quality education for all. Numerous scholars have analyzed this goal within the context of European educational policy and its linkage to the economic and social objectives of the Europe 2020 strategy.

According to Aleksandra Pleśniarska (2019), European institutions have long sought to align the implementation of the 2030 Agenda with their own development frameworks. The author notes that although positive trends are evident in tertiary and lifelong education, significant disparities remain among EU member states. Gender-based inequalities in educational attainment and graduate employability demonstrate that the Union has not yet fully achieved its 2020 objectives. Momete and Momete (2021) expanded this discussion by proposing a framework for measuring progress in Education for Sustainable Development (ESD) across EU countries. Their research resulted in a composite index that enables comparison of member states' performance in achieving SDG 4 and identification of best practices. Boeren (2019) approaches the issue from micro, meso, and macro-level perspectives, emphasizing the need to integrate individual, institutional, and governmental dimensions in achieving SDG 4.

At the global level, Durrani et al. (2023) examined how the COVID-19 pandemic affected progress toward SDG 4 through a case study of Kazakhstan. Their findings correspond with those of Gunawan (2025), who highlights that socio-economic, geographical, and digital divides exacerbate educational inequalities. Both authors conclude that the pandemic exposed not only technological and infrastructural weaknesses but also deep-rooted social disparities that hinder advancement toward quality education. Building on these insights, Sáenz-Rico de Santiago and Mendoza Carretero (2023) stress the need, in the European context, to integrate economic, social, and environmental dimensions of sustainable development into educational strategies.

Equality of access and inclusive education represent another key thematic dimension. Ramtohl (2024) emphasizes that the core objective of SDG 4 is not only to ensure accessibility but also to guarantee equal opportunities for acquiring knowledge and skills. Reinders, Dekker and Falisse (2020) add that inequalities in higher education cannot be explained solely by financial factors - sociocultural determinants play an equally decisive role. This perspective is further developed by Verma et al. (2025), who argue that higher education institutions can contribute to reducing social inequalities through their research and educational activities, thereby supporting the achievement of both SDG 4 and SDG 10.

The role of higher education as an instrument of sustainable growth is reflected in the work of Popelo et al. (2023), who analyze the contribution of EU universities to implementing sustainability principles. Hara (2025) extends this discussion to ASEAN countries, where insufficient digital infrastructure and unequal access to education constrain economic development. An empirical contribution is provided by Saini, Sengupta, Singh et

al. (2023), who use a genetic algorithm to analyze the interconnections among SDG 4 indicators and emphasize the necessity of adopting a comprehensive and systemic approach to education policy.

A concluding perspective is offered by Edwards, Asadullah, and Webb (2024), who assess mid-term progress of the 2030 Agenda and underline the persistent gaps between declared goals and achieved outcomes. Ritzen and Zomerplaa (2025) add a European dimension to this debate, highlighting the need for structural reforms, stronger investment in innovation capacity, and enhanced regional cohesion to maintain the EU's competitiveness in a rapidly changing world.

Despite regional differences and the variety of methodological approaches, scholars generally agree that quality and inclusive education constitute a fundamental prerequisite for sustainable development, social justice, and economic prosperity. The alignment of the global SDG 4 agenda with regional strategies, such as Europe 2020, therefore remains an essential condition for achieving a balanced and equitable education system.

The review of relevant scholarly literature suggests that while there is a significant body of studies focused on the retrospective evaluation of the educational goals of the Europe 2020 strategy, most of them primarily use descriptive analysis to assess progress up to 2020. These works effectively map the achieved status and identify both successful and lagging member states. The key research gap in the current literature lies in the lack of a comprehensive quantitative analysis that would systematically link the evaluation of Europe 2020 strategy target achievement with a prediction of the dynamics of change in relation to the new goals of the 2030 Agenda (SDG 4). Specifically, existing research rarely employs inferential statistical methods (such as regression trend analysis) for projecting future development towards the 2030 targets, particularly for each individual EU Member State. Our study aims to fill this gap. By applying descriptive and regression analysis to currently available Eurostat data, we will not only evaluate the progress achieved up to 2020 (in line with RQ1) but also estimate whether the current rate of change will allow the EU and its member states to meet the more ambitious targets set for 2030 (in line with RQ2).

3. Methodology

The methodology of this paper is based on a quantitative analysis of statistical data aimed at evaluating the progress of the European Union in fulfilling its educational goals as set out in the Europe 2020 strategy and further developed in the 2030 Agenda for Sustainable Development (SDG 4).

The quantitative analysis applied in this paper combines descriptive and inferential statistical techniques in order to comprehensively assess the progress and convergence of EU member states in achieving the educational objectives set by the Europe 2020 strategy and SDG 4 of the 2030 Agenda.

The descriptive statistical analysis allows to evaluate the current state and variability of the two main indicators:

- early leavers from education and training (ELER) and
- tertiary education attainment rate (TEAR) across EU member countries.

This part of the analysis provides insight into differences in performance, dispersion from the EU average, and deviations from national or EU targets. Such descriptive evaluation directly answers the first research question (RQ1), which focuses on **how EU member states have progressed toward the educational goals by 2020**.

The second stage of the quantitative approach applies regression trend analysis, designed to estimate the future trajectory of both indicators up to 2030. By testing alternative functional forms (linear, logarithmic, and polynomial), the analysis identifies the model with the highest explanatory power and statistical significance (based on R^2 and F-tests). This enables an evidence-based prediction of whether the EU as a whole is likely to meet its 2030 targets. Hence, the regression analysis provides an empirical response to the second research question (RQ2), which examines **whether the current dynamics of change are sufficient to achieve the targets set for 2030**.

The quantitative methods were chosen because they allow a transparent, comparable, and replicable assessment of educational performance across countries and over time. In addition, regression-based forecasting supports policy evaluation by indicating the pace and direction of convergence toward the 2030 Agenda goals. Together, these analytical steps ensure that the research findings are statistically sound and directly aligned with the paper's main objectives - evaluating the progress to date and predicting the probability of achieving SDG 4 in the European context.

Descriptive analysis

In the first step, a descriptive analysis is conducted to evaluate the extent to which EU member states fulfilled their national targets by 2020. The relative deviation of each country from its national or European target is expressed as:

$$D_{i,t} = \frac{X_{i,t} - T_i}{T_i} \times 100 \quad (1)$$

where:

$D_{i,t}$ – deviation of country i in year t from the target value,

$X_{i,t}$ – actual value of the indicator,

T_i – target value (national or EU).

This indicator allows for a direct comparison between member states, showing by what percentage they exceed or lag behind their target.

Trend analysis

The second step involves forecasting the future development of the monitored indicators up to 2030 using regression analysis. The general regression function can be expressed as:

$$Y_t = f(t, \beta) + \varepsilon_t \quad (2)$$

where:

Y_t – predicted value of the indicator at time t ,

$f(t, \beta)$ – trend function dependent on time and regression coefficients,

ε_t – random error term.

To identify the best-fitting trend, several functional forms are tested:

Linear trend:

$$Y_t = \alpha + \beta t + \varepsilon_t \quad (3)$$

Logarithmic trend:

$$Y_t = \alpha + \beta \ln(t) + \varepsilon_t \quad (4)$$

Polynomial trend of the second degree:

$$Y_t = \alpha + \beta_1 t + \beta_2 t^2 + \varepsilon_t \quad (5)$$

The function with the highest explanatory power and statistical significance will be selected for forecasting values for 2025–2030.

Model evaluation

To assess model quality and reliability, several statistical measures are used:

Coefficient of determination:

$$R^2 = 1 - \frac{\sum(Y_t - \hat{Y}_t)^2}{\sum(Y_t - \bar{Y})^2} \quad (6)$$

This coefficient expresses how much of the total variability of the indicator is explained by the model.

F-test for overall model significance:

$$F = \frac{SSR/k}{SSE/(n-k-1)} \quad (7)$$

where:

SSR – regression sum of squares,

SSE – residual (error) sum of squares,

k – number of independent variables,

n – number of observations.

Models with statistically significant coefficients (p-value < 0.05) and the highest R^2 are considered the most appropriate for predicting the future development of educational indicators.

4. Results

4.1 Early leaving from education and training

As was already stated, one of the sub-goals of the Europe 2020 strategy in the field of education, which is also one of the sub-goals of SDG 4 of the 2030 Agenda for Sustainable Development, is to address the problem of early leaving from education and training. Given that the Europe 2020 strategy is no longer in effect, it is possible to evaluate the success or failure of member countries in achieving this goal. Figure 1 shows the degree to which a country is lagging behind or exceeding its national target for this particular indicator. Positive values represent the percentage by which the actual achieved value of the monitored indicator exceeds the national target. Conversely, negative values express the percentage by which the country lags behind the target value. By 2020, the European Union managed to meet the target of 10%, even exceeding this target by 0.1 percentage points. Nine countries had a national target set at the level of the EU27 target. Due to the seriousness of the problem related to early leaving from education and training, Bulgaria, Romania, Italy, and Spain set national targets exceeding 10%.

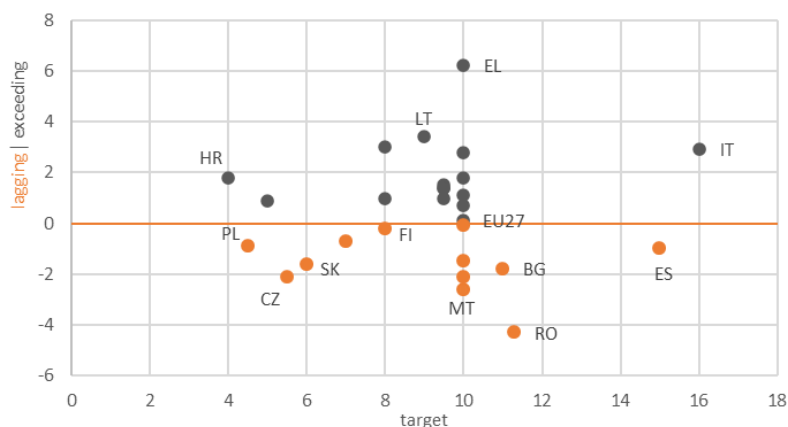


Figure 1. Distance of countries from target values in 2020 for the indicator of early leaving from education and training
Source: own processing based on data from Eurostat, 2025

From the 27 EU member countries in 2020, 12 countries lagged behind their national targets. In Romania, the proportion of young people prematurely leaving education or training was 4.3 percentage points behind the target, in Malta it was 2.6 percentage points, and in the Czech Republic and Hungary it was 2.1 percentage points each. Countries that also failed to achieve the set goal by 2020 include Bulgaria, Slovakia, Cyprus, Spain (lagging between 1 and 1.8 percentage points), Poland, Sweden, Finland, and Germany (lagging between 0.1 and 0.9 percentage points). On the contrary, 15 member countries managed to fulfill the set goals.

Regarding the progress achieved, the leader among the member countries in the monitored indicator is Greece, which exceeded its national target by as much as 62 percentage points. This positive result can be explained to some extent by an ambitious national target of 10%. Croatia, as the second in a row, achieved an early leaving from education and training rate of 2.2%, which is the best result within the EU. With this, it met its national target, which was 4%, and exceeded it by 45 percentage points. Denmark, whose national target was at the level of 10%, only exceeded it by 7 percentage points.

Overall, however, significant disparities can be seen among the member countries in the indicator of early leaving from education and training. This is a result of the different policies applied, as well as the tools and specific measures enforced in EU countries. For this reason, the 2030 Agenda continues to deal with this issue, according to which the proportion of people who prematurely leave education and training should be less than 9% by 2030 (the target for the EU27). This indicator is also used to express the principles of the European Pillar of Social Rights and to monitor the goals of sustainable development.

Given the fact that not all countries have their own target values set for the period up to 2030, the following analysis will focus on a comparison with the average target for the EU27, i.e., 9%.

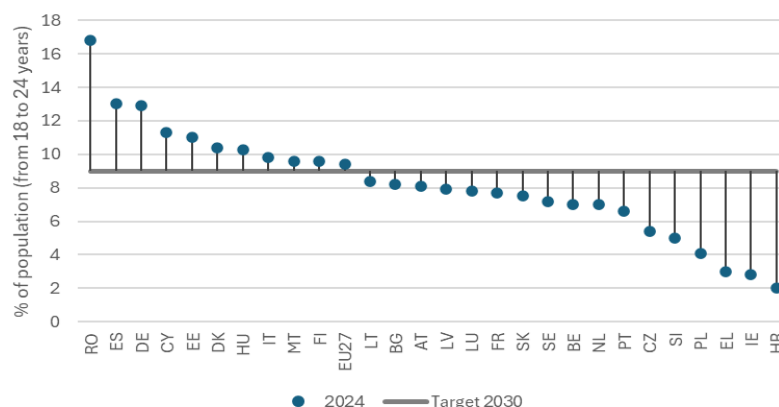


Figure 2. Distance of countries from the 2030 target for the indicator of early leaving from education and training
Source: own processing based on data from Eurostat, 2025

Based on data from Eurostat, it can be stated that in 2024, 17 countries were below the EU's target value (Figure 2), which means that in these countries less than 9% of young people aged 18-24 prematurely left education and training in the monitored year. The average value for the EU27 in 2024 was 9.4%, which points to the necessity of reducing the share by at least 0.4 percentage points by 2030. The country farthest from the target was Romania with an indicator value of 16.8%. This was followed by Spain (13.0%) and Germany (12.9%).

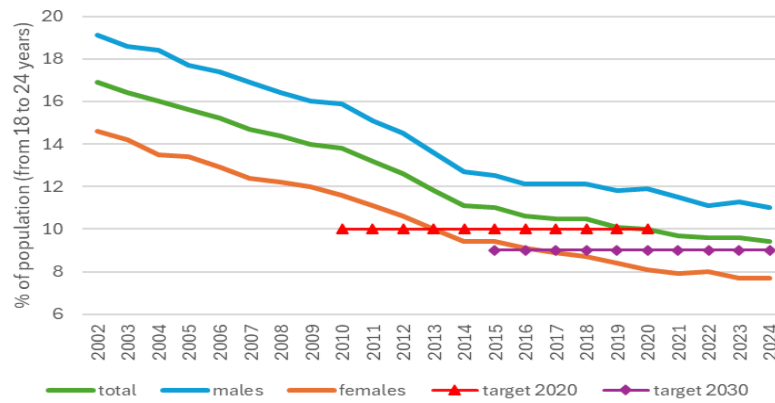


Figure 3. Development of early leaving from education and training in the EU by gender and convergence towards the targets
Source: own processing based on data from Eurostat, 2025

From a long-term perspective, the share of the population aged 18 to 24 who prematurely leave education and training out of the total population in this age category is developing positively, i.e., it is decreasing. While this indicator was at the level of 16.9% in 2002, in 2024 it was 9.4%, which means a slight lag behind the target value (Figure 3). Throughout the entire monitored period, women performed better than men in terms of gender and have been reaching the target value since 2017. In 2024, men in the EU significantly lagged behind the target.

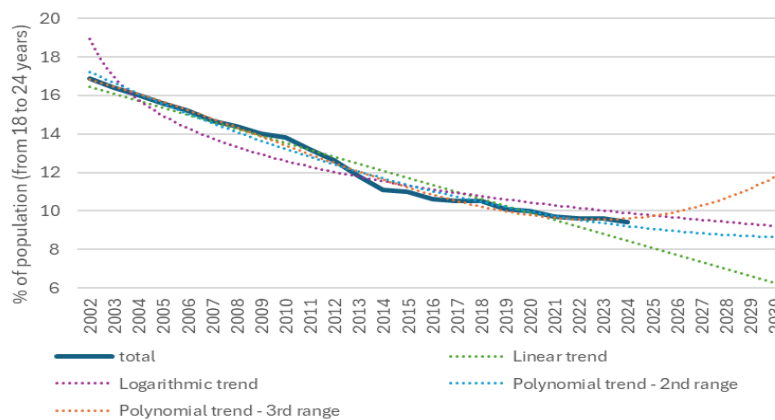


Figure 4. Expected development of the indicator early leaving education and training in the EU by 2030
Source: own processing

The current development of the monitored indicator can be expressed through several functions (Figure 4). The results of the testing show that the most probable trend of development is described by a 2nd-degree polynomial function. The p-value for the intercept is $3.47\text{E-}27 < 0.05$, and for the regression coefficients, it is $2.33\text{E-}12 < 0.05$ and $6.84\text{E-}06 < 0.05$, which indicates the statistical significance of both the intercept and the regression coefficients (Table 1). The result of the F-test, $1.49\text{E-}19 < 0.05$, confirms the statistical significance of the entire chosen model.

Table 1. Results of regression analysis

Regression Statistics						
Multiple R	0,993426					
R Square	0,986895					
Adjusted R Square	0,985584					
Standard Error	0,301982					
Observations	23					

	df	SS	MS	F	Significance F	
Regression	2	137,35	68,67	753,06	1,49E-19	
Residual	20	1,82	0,09			
Total	22	139,17				

	Coefficients	Stand. Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	17,80	0,21	86,15	3,47E-27	17,37	18,23
X Variable1	-0,60	0,04	-15,03	2,33E-12	-0,68	-0,51
X Variable2	0,01	0,00	6,03	6,84E-06	0,01	0,01

Source: IBM SPSS

If the development of the indicator representing the share of the population aged 18-24 who prematurely left education and training were to follow a linear function (Table 2), the EU27 would achieve the 2030 Agenda goal this year. The value of the indicator would fall below the required 9%. The other extreme case is if the past development were to follow a 3rd-degree polynomial function. In that case, the EU would show a year-on-year increasing trend in the monitored indicator, moving it further away from the set target for 2030.

Table 2. Expected development of the early leaving from education and training indicator until 2030

	2025	2026	2027	2028	2029	2030	Target
$y = -0,3639x + 16,832$ $R^2 = 0,9631$	8,10	7,73	7,37	7,01	6,64	6,28	9
$y = 0,0097x^2 - 0,596x + 17,799$ $R^2 = 0,9869$	9,08	8,96	8,86	8,78	8,72	8,67	9
$y = 0,0009x^3 - 0,0217x^2 - 0,2882x + 17,119$ $R^2 = 0,9934$	10,14	10,41	10,78	11,23	11,79	12,46	9
$y = -2,888\ln(x) + 18,945$ $R^2 = 0,9004$	9,77	9,65	9,54	9,43	9,32	9,22	9

Source: self-calculations

The results of the regression analysis, however, showed that the most accurate model can be considered the one expressed by a 2nd-degree polynomial function, i.e., quadratic. According to this development, the EU27 would gradually improve in the monitored area and would succeed in reducing the share of people prematurely leaving education and training below 9% for the first time in 2026.

4.2 Tertiary education attainment

The second sub-goal in the field of education is achieving tertiary education. This is based on the indicator representing the share of the population with a university education aged 30-34 in the total population of that age group. The target value of this indicator, which was to be achieved under the Europe 2020 strategy on average for the EU27, was 40% and under the 2030 Agenda it is 45%.

Figure 5 allows us to assess the values of the share of individuals aged 30-34 with tertiary education in relation to the set national targets. The perspective of fulfilling the national targets of the Europe 2020 strategy offers a different view of the successes of individual member countries. The largest overshoot in the indicator relative to the set national target among member countries was achieved by Latvia, which exceeded its national target

by almost 45 percentage points. Greece, the Netherlands, Cyprus, and Denmark also achieved excellent results. In total, 17 member countries met their national targets in 2020.

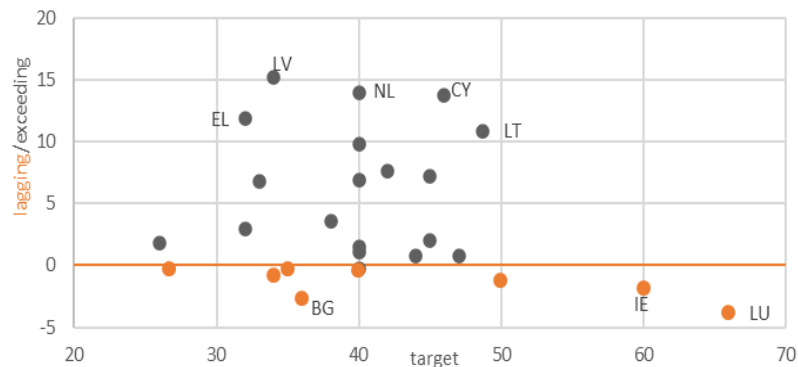


Figure 5. Distance of countries from target values in 2020 for the indicator of individuals with tertiary education completed aged 30-34 in 2020

Source: own processing based on data from Eurostat, 2025

An interesting fact about this indicator is that Luxembourg had the highest share of people aged 30-34 in 2020 (62.2%). However, given its highest target of 66%, it did not meet its goal. Similarly, Ireland and France set ambitious targets that they failed to meet. The result for Germany is also interesting, as it lagged the most behind its national target among the member countries, by almost 13 percentage points. The second most lagging country behind its national target was Bulgaria.

Successfully completed tertiary education is becoming increasingly important given the increased demand for highly skilled individuals in the EU labor market. Tertiary education plays a fundamental role in society by fostering innovation, boosting economic development and growth, and generally improving the well-being of citizens. In February 2021, the Council of the European Union (Rada Európskej únie, 2021) approved a resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030). This resolution sets a Union-wide target for the share of people aged 25-34 with tertiary education to be at least 45% by 2030. It is therefore necessary to point out the change in the age category for the 2030 target. This change will disrupt the continuity of data, as well as the possibilities for comparing the fulfillment of goals when tracking the continuity of the Europe 2020 strategy and the 2030 Agenda.

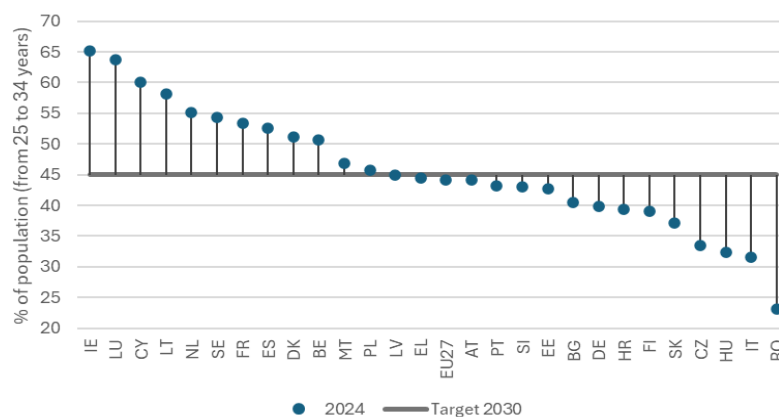


Figure 6. Distance of countries from the 2030 target for the indicator of tertiary education attainment

Source: own processing based on data from Eurostat, 2025

A comparison of the 2030 targets and the shares of people aged 25-34 with tertiary education is presented in Figure 6. We recorded a value of over 45% for the indicator in 12 countries. The leaders are Ireland, Luxembourg, and Cyprus, with shares higher than 60%. The average value in the EU is 0.9 percentage points below the set target.

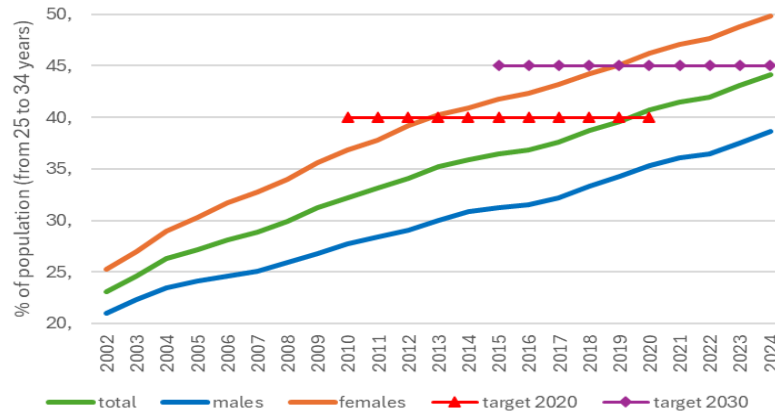


Figure 7. Development of tertiary education attainment in the EU by gender and convergence towards targets
Source: own processing based on data from Eurostat, 2025

Four countries, in particular, contribute negatively to the evaluation of the indicator, where the share of people aged 25-34 with tertiary education lags behind the European average by more than 10 percentage points (in the case of Romania, it is even 21.8 percentage points).

From a long-term perspective, the share of the population aged 25-34 with tertiary education out of the total population of this age group is also developing positively for the EU average, i.e., it is increasing. While in 2002 this indicator was at 23.1%, in 2024 it was 44.1%, which means a slight lag behind the target value (Figure 7). Also in this indicator, women achieve better results than men, exceeding the target value since 2019. They were similarly successful in achieving the 40% target related to the Europe 2020 strategy.

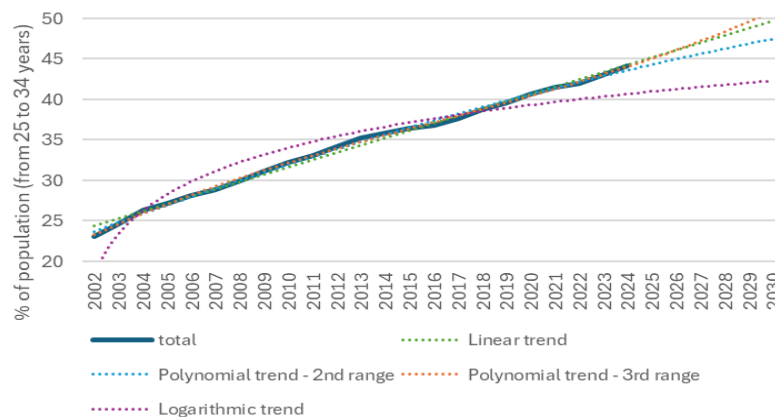


Figure 8. Expected development of the indicator tertiary education attainment in the EU by 2030
Source: own processing

The past development of the indicator can be expressed through several functions and trends shown in Figure 8. The results of the testing show that the most probable trend of development is described by a 2nd-degree polynomial function. The p-value for the intercept is $4.71\text{E-}28 < 0.05$, and for the regression coefficients, it is $1.84\text{E-}16 < 0.05$ and $7.21\text{E-}05 < 0.05$, which indicates the statistical significance of both the intercept and the regression coefficients (Table 3). The result of the F-test, $3.93\text{E-}26 < 0.05$, confirms the statistical significance of the entire chosen model.

Table 3. Results of regression analysis

Regression Statistics						
Multiple R	0,998559					
R Square	0,99712					
Adjusted R Square	0,996832					
Standard Error	0,346712					
Observations	23					

	df	SS	MS	F	Significance F	
Regression	2	832,27	416,13	3461,76	3,93E-26	
Residual	20	2,40	0,12			
Total	22	834,67				

	Coefficients	Stand. Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	22,58	0,24	95,21	4,71E-28	22,09	23,08
X Variable1	1,12	0,04	24,71	1,84E-16	1,03	1,22
X Variable2	-0,01	0,00	-4,98	7,21E-05	-0,01	-0,01

Source: IBM SPSS

If the development of the indicator representing the share of the population aged 25-34 who have completed tertiary education were to follow a linear function (Table 4), the EU27 would achieve the 2030 Agenda goal this year. The value of the indicator would rise above the required 45% and to almost 50% by 2030. Also in this case, the development described by a 3rd-degree polynomial function can be considered the least realistic due to relatively sharp year-on-year changes.

Table 4. Expected development of the tertiary education attainment indicator until 2030

	2025	2026	2027	2028	2029	2030	Target
$y = 0,9052x + 23,502$ $R^2 = 0,9935$	45,23	46,13	47,04	47,94	48,85	49,75	45
$y = -0,0092x^2 + 1,1254x + 22,585$ $R^2 = 0,9971$	44,30	44,97	45,63	46,26	46,88	47,48	45
$y = 0,001x^3 - 0,0439x^2 + 1,4658x + 21,833$ $R^2 = 0,9984$	45,55	46,67	47,84	49,09	50,41	51,81	45
$y = 7,0807\ln(x) + 18,478$ $R^2 = 0,9026$	40,98	41,27	41,55	41,82	42,07	42,32	45

Source: self-calculations

The results of the regression analysis show that the most accurate model can be considered the one expressed by a 2nd-degree polynomial function. With a probability of 99.71%, the EU 27 should succeed in achieving the required level of tertiary education for 45% of the population in the given age category in 2027.

Discussion

Regarding the tertiary education goal, Dragomirescu-Gaina, Elia and Weber (2015) highlighted an increasing performance gap among states and underscored the constrained opportunity for authentic economic convergence. Cotoi et al. (2011) indicated the necessity of creating and promoting entrepreneurial skills through the educational process. Panitsidou, Griva and Chostelidou (2012) pointed out the need to support lifelong learning through European Union policies. Lifelong learning has also proven to be a significant factor in achieving employment goals in the labor market. Klikocka (2019), Panitsides (2014), and Cuestas et al. (2021) focused on the importance of education for the knowledge economy.

Educational performance has long been considered a crucial element in multidimensional assessments of development and inequality across countries (Ferrara & Nisticò, 2013; Mitrovic et al., 2017; Monte & Schoier,

2022). Composite indicators have therefore become a valuable methodological approach for capturing the complexity of education systems, enabling both international comparison and policy benchmarking. Numerous studies (Jovanovic-Gavrilovic & Radivojević, 2017; Villar, 2017; Stumbrienė, Camanho & Jakaitienė, 2020; Dominguez et al., 2022) have used such indicators to evaluate national education systems and identify key drivers of performance. In particular, Stumbrienė, Camanho, and Jakaitienė (2020) developed a flexible composite indicator designed to summarize education performance and benchmark countries according to efficiency and inclusiveness. Their findings demonstrated that applying frontier-based methods can shift the analytical focus from mere performance evaluation toward continuous improvement and management of educational outcomes. Other authors, such as Murias et al. (2008), El Gibari et al. (2018), Benito & Romera (2011), Gnaldi & Ranalli (2016), Docampo & Cram (2017), and Bas & Carot (2022), further confirmed the usefulness of composite indicators in assessing the quality and effectiveness of higher education institutions.

The study by Stumbrienė Camanho, and Jakaitienė (2020) concluded that European countries are not bound by a common political approach to establish inclusion and equity within their educational frameworks. They further argued that the economic idea of efficiency must be interpreted differently when used for education, necessitating a focus on the particularities of each country's education system.

The consequences of not fulfilling the SDG 4 goals in achieving tertiary education and reducing the number of early leavers from education and training by 2030 are fundamental, especially for socioeconomic development and equality. Failure to meet these goals can deepen existing inequalities, hinder economic growth, and perpetuate cycles of poverty, especially in low-income countries where education systems are already fragile. The main consequences of this failure are economic, social, and global in nature.

The economic consequences can be considered to reduce competitiveness of the workforce. Insufficient achievement of tertiary education limits the qualification profile of the workforce, which reduces overall productivity and the potential for economic growth (Heleta & Bagus, 2021). The problem is also the increase in early leavers from education, leading to a less educated workforce. This has a negative impact on innovation activity and the overall performance of the economy (Cuestas et al., 2021).

The social consequences can include, for example, the deepening of inequalities. Failure to meet the SDG 4 goals can widen social disparities, especially for marginalized groups who already face barriers to accessing education (Vindigni, 2024). Another problem is the dependence on foreign aid, as countries may increasingly rely on external assistance, which weakens local educational capacity and sustainability (Heleta & Bagus, 2021). Deficiencies in education can also have an impact on global development, as education is a catalyst for achieving other sustainable development goals. Therefore, a failure to meet SDG 4 can hinder progress across the entire development agenda (Brissett, 2023). On the other hand, some argue that an excessive focus on SDG 4 might overlook the need for immediate, context-specific interventions that respond to local educational challenges. This can lead to ineffective policies that do not reflect the unique needs of different populations.

Conclusions

The aim of the article was to evaluate and analyze the progress in fulfilling the educational targets within the European Union, as defined by the Europe 2020 strategy and further developed in the 2030 Agenda for Sustainable Development (SDG 4), and to project the possible future development of the monitored indicators up to 2030. Using descriptive and regression trend analysis, we were able to obtain specific findings in two key areas, reflected by research questions RQ1 and RQ2.

1. Achievement of national targets by 2020 (RQ1)

The analysis of the indicator for the share of individuals leaving education and training early showed that the EU as a whole met its main target (below 10%). However, only 15 out of 27 member states successfully achieved their individual national targets. The countries that lagged behind, despite progress, primarily included Romania, Spain, and Germany. The greatest progress was recorded by Greece, Croatia, and Ireland.

In the area of tertiary education attainment, progress was more significant. 17 out of 27 member states met their national targets. This indicates a more successful trajectory for the EU towards SDG 4.3. Greece, the Netherlands, Cyprus, and Denmark achieved excellent results. The most significant shortfall against the national target was shown by Luxembourg, Bulgaria, and Ireland.

2. Projection of target fulfillment by 2030 (RQ2)

The regression trend analysis demonstrated that if the current dynamics of change persist, the EU as a whole is highly likely to meet the target for the share of early leavers from education and training (below 9%) by 2030. Specifically, the best estimated polynomial trend of the 2nd order predicts that the target value could be achieved as early as 2026.

In the area of tertiary education as well, the analysis suggests that the EU is on track to meet the target (at least 45%). This could be achieved as early as 2027 if the projected development follows a 2nd order polynomial function.

The novelty of our research lies in the methodological linking of two key EU strategies and the application of quantitative predictive models. Unlike predominantly retrospective descriptive studies, our work systematically tested several functional forms (linear, logarithmic, polynomial) to estimate future development, thereby providing a more realistic and robust estimate of the trajectory of SDG 4 goal achievement. Such a detailed comparison of regional disparities based on the estimated trend for individual targets up to 2030 represents a unique contribution to the discussion on sustainable development in Europe.

The results obtained have significant practical value for policymakers at both the European and national levels. Data on lagging countries clearly point to areas where increased financial and methodological support from the European Social Fund should be directed. Overall, our analysis provides a quantitative basis for the review and optimization of national educational strategies to ensure alignment between the global commitments of the 2030 Agenda and European regional goals.

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