Mar, 2026
GRINS DISCUSSION PAPER SERIES DP N° 96/2026 ISSN 3035-5567

GRINS

Designing a Database on University Students: Data Integration, European Positioning, and Research and Policy Perspectives

DP N° 96/2026

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KEYWORDS

Higher Education | Longitudinal Student Data | Data Integration and Harmonization

JEL CODE

I23, C81, J24

ACKNOWLEDGEMENTS

This study was funded by the European Union - NextGenerationEU, in the framework of the GRINS - Growing Resilient, INclusive and Sustainable project (GRINS PE00000018). The views and opinions expressed are solely those of the authors and do not necessarily reflect those of the European Union, nor can the European Union be held responsible for them.

CITE THIS WORK

Author(s): Piera Bello, Marianna Brunetti, Annalisa Cristini, Cristina Davino, Adriana Di Liberto, Fabio Farella, Magali Fia, Margherita Fort, Rosa Fabbricatore, Giulia Leoni, Costanza Marconi, Elisa Melis, Marco Giovanni Nieddu, Federica Origo, Angelo Paletta, Elena Pisanelli, Veronica Rattini, Rosaria Romano, Laura Serlenga, Daniela Vuri. Title: Designing a Database on University Students: Data Integration, European Positioning, and Research and Policy Perspectives. Publication Date: 2026.

This discussion paper presents the “Database on University Students” developed within WP2, Spoke 3 of the GRINS project, outlining its methodological foundations, European positioning, and future research potential. It describes a panel dataset that integrates key information from partner universities to capture the academic careers and employability of university students, while accounting for their socio-economic context and undergraduate educational paths. This discussion details the main activities underpinning the database design, including data collection, harmonization, integration, and comparability, and highlights the main methodological challenges and opportunities emerging from these processes. Furthermore, it emphasizes the database’s potential to become the first of its kind in Italy and one of the richest in the European landscape, as it addresses the persistent fragmentation that characterizes existing information systems. Finally,

the discussion paper provides illustrative examples through a collection of research abstracts, demonstrating the database's potential to inform education policy and practice.

Designing a Database on University Students:

Data Integration, European Positioning, and Research and Policy Perspectives

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Abstract

This discussion paper presents the "Database on University Students" developed within WP2, Spoke 3 of the GRINS project, outlining its methodological foundations, European positioning, and future research potential. It describes a panel dataset that integrates key information from partner universities to capture the academic careers and employability of university students, while accounting for their socio-economic context and undergraduate educational paths. This discussion details the main activities underpinning the database design, including data collection, harmonization, integration, and comparability, and highlights the main methodological challenges and opportunities emerging from these processes. Furthermore, it emphasizes the database's potential to become the first of its kind in Italy and one of the richest in the European landscape, as it addresses the persistent fragmentation that characterizes existing information systems. Finally, the discussion paper provides illustrative examples through a collection of research abstracts, demonstrating the database's potential to inform education policy and practice.

Keywords: Higher Education, Longitudinal Student Data, Data Integration and Harmonization

JEL code: I23, C81, J24

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Designing a Database on University Students:
Data Integration, European Positioning, and Research and Policy Perspectives

This discussion paper describes the "Database on University Students" developed within WP2, Spoke 3 of the GRINS project, and outlines its methodological foundations, European positioning, and future research potential.

The Discussion Paper is structured as follows:

Section 1 *Novel Dataset and Indicators for Research and Policy on Higher Education* (pages 3-6) describes the construction of a new panel on students' careers, integrating administrative data and surveys from the PE9 Universities. This section highlights findings from the longitudinal data collection and harmonization efforts carried out within WP 2, Spoke 3 of the GRINS project, specifically for the "database on the university students". It provides critical insights into data comparability and methodological challenges and opportunities, featuring researchers from the PE9.

Section 2 *Positioning the GRINS "Database on University Students" in the European Landscape* (pages 7-16) positions the "database on the university students" GRINS project at the European level, by identifying European initiatives that follow cohorts of students over time. The research considers selected institutional repositories and EU policy portals, using targeted queries to identify European projects or databases that focus on *students' education pathways*, as well as *transitions across education stages and/or into employment*.

Section 3 *Selected Research Projects* (pages 17-57) provides a list of selected extended abstracts of future projects that will draw on the "database on the university students" GRINS project, in order to highlight the related added value for informing education policy and practice.

Section 1 - Novel Dataset and Indicators for Research and Policy on Higher Education

The project aims to construct a comprehensive panel dataset capturing the academic trajectories of university students. This involves integrating administrative data and AlmaLaurea information from partner universities, complemented by survey data and experimental research.

This section highlights the main findings of the "database on the university students" referring to the data collection, harmonization, integration, comparability, and the main methodological challenges and opportunities.

The dataset produced has the potential to become the first-of-a-kind in the Italian context, and one of the richest in the European landscape. The rich – mostly administrative – data are taken from different sources and cover, in a single and completely harmonized framework, the academic careers and the employability of university students, along with their socio-economic context and undergraduate education path.

Based on this dataset, the researchers and the policy makers will be able to derive an extremely rich and novel set of indicators on higher education outcomes, highly complementary to the basic ones produced, e.g. by Almalaurea, making this dataset not only particularly suitable for empirical analyses, but also for policy evaluations aimed at understanding institutional performance, inequality, and the effectiveness of targeted interventions in higher education.

In what follows, we provide an illustrative and non-exhaustive list of potentially computable indicators, organized into three ideal thematic areas, corresponding to key stages of the higher education process, namely: 1. Access to university; 2. Academic outcomes; 3. Exit from university: from dropout to employability.

1. Access to university

A first thematic area focuses on access to higher education. While prior studies and national reports typically focus on aggregate enrollment rates or broad socio-demographic profiles of first-year students, the indicators constructed here enable a more granular assessment of *who* accesses university education, *where*, and under which *socio-economic conditions*. To this end, a particularly informative indicator is "Students enrolled per socio-economic status (SES)", that captures the SES composition of incoming cohorts, allowing for, e.g., the identification of substantial heterogeneity across universities in terms of inclusiveness, an aspect that is rarely observable in existing datasets. Compared to existing sources such as AlmaLaurea, which mainly document graduates' characteristics ex post, the indicators potentially computable in this domain will provide a genuinely

ex ante perspective on inequality, capturing differences and potential disparities at the moment of entry, before academic performance or dropout mechanisms can exert their effects. As such, they are particularly valuable for policy evaluation, as they allow for the assessment of universities' roles in widening participation independently of subsequent selection processes.

Closely related to what above, are the set of indicators on geographic mobility, which can be computed based by linking students' geographical origin to their socio-economic background and to the chosen institution and field of study. The role of spatial constraints and mobility costs is widely recognized in the literature on access to higher education, and this indicator could concretely contribute to quantify and operationalize these mechanisms. Key potential indicators include "Geographic mobility in the school-university transition" and "Geographic mobility in the transition Bachelor to Master", which track students' movements across regions and across the 5 institutions involved in the project.

Finally, based on our data it will be possible to compute indicators such as "Parents' educational legacy", measuring the tendency of university graduates to choose the same degrees as their parents"

To sum up, the indicators potentially computed will provide novel insights into universities' capacity to attract – and retain – students from different geographical areas and socio-economic backgrounds, offering a richer perspective on spatial inequalities and institutional positioning within the higher education system.

2. Academic career

The second thematic area refers to the students' academic performance, which really represents the focal component of the dataset. Unlike conventional performance measures that rely on single outcomes—such as final grades or degree completion—the indicators potentially computable based on our dataset are able to capture multiple, complementary aspects of academic performance, reflecting both levels and dynamics of achievement.

A key indicator in this domain is "Students' performance gaps", which measures differences in academic outcomes—such as average exam grades or credit accumulation—across socio-economic status (SES), gender, and degree type within the same university. The novelty of this indicator lies in its ability to isolate performance disparities net of institutional context. While much of the existing literature documents average performance differences across student groups at the national level, far fewer studies are able to observe whether such gaps widen or narrow within specific

institutional environments. This indicator therefore provides a direct measure of universities' capacity to mitigate or amplify pre-existing inequalities once students are enrolled.

Closely related is the indicator capturing academic progression and delay, constructed using information on accumulated credits relative to the expected study plan. This measure moves beyond static performance indicators by explicitly accounting for the timing of academic achievement. Delays in progression are a well-established predictor of dropout and extended time-to-degree, yet they are rarely studied. By systematically integrating progression delays into the performance dimension, the dataset enables a more process-oriented understanding of academic success, highlighting early signs of difficulty that may not be visible through grades alone. Based on the above, we can also distinguish between temporary underperformance and persistent academic struggle. This longitudinal perspective is rarely available in standard reports (e.g., Almalaurea) and – to the best of our knowledge – never conditioned on SES or gender, or course of enrollment. The produced indicators will thus be well suited for identifying critical phases in students' academic trajectories and where institutional support may be most effective.

Again, the main advantage compared to existing sources such as AlmaLaurea, is that the latter primarily report ex post outcomes for graduates, while in this case, we might be able to provide a much richer and in-itinere perspective.

3. Exiting the University: from drop-out to employability

A third thematic area concerns the various forms and causes of exiting the University.

The first one is drop-out. Representative indicators in this domain include the classical share of students at risk of dropout, and other measures based on academic delay. Most importantly, our dataset will allow the computation of these indicators by different levels of SES, geographical area of origin, undergraduate education path, and gender. These can also be used to figure out and test the predictive power of different early warning signals of disengagement and attrition, aspects highly relevant for the university governance.

The second main form of exiting from the University is entering the labour market. The dataset allows for the construction of indicators such as "Students' employability status by socio-economic status" and "Employment/access to the job market", based on post-graduation survey information on employment status, job search outcomes, and early career conditions. Other indicators include e.g. "Student-teacher-ratio employment premium" or the "Student-teacher-ratio wage gap", that measure of the gain/loss in terms of employment rate and wage gap related to attending classes with (relatively) few peers.

These indicators go beyond simple employment rates by explicitly linking labor market outcomes to students' socio-economic background, demographic characteristics such as gender, and academic careers outcomes, enabling analyses of whether and how universities contribute to reducing (or amplifying) inequalities in labor market access among graduates.

The feasibility and analytical value of the indicators illustrated above are intrinsically linked to the ability to integrate, harmonize, and govern heterogeneous data sources over time. In other words, the construction of meaningful longitudinal indicators on access, academic careers, and transitions into the labor market presupposes not only technical data integration but also institutional coordination, shared standards, and appropriate data governance arrangements. From this perspective, the project actively contributes to strengthening these conditions by supporting coordination across institutional actors, advancing data governance arrangements, ensuring legal and GDPR compliance, and developing the interoperability required to link administrative sources and survey evidence into a coherent longitudinal architecture.

Ongoing efforts involved selecting variable formats for the codebook, drafting indicators for the dashboard, and engaging in privacy discussions with stakeholders and the Data Protection Officer. These activities highlighted the collaborative nature of the project, including general and coordination meetings, the development of the integrated data structure, the definition of the research themes, and the definition of privacy protocols.

These aspects are consistent with those identified at the European level. For example, the European Commission (2021) explicitly identifies the institutional, legal, methodological, and organizational capacity areas that countries should strengthen in order to fully participate in a common European graduate tracking mechanism, and stresses the importance of aligning European initiatives with existing national systems while supporting administrative–survey data linkage.

In this respect, GRINS can be read as a national implementation case that illustrates how these European priorities can be operationalized in practice.

Reference

European Commission. (2021). Capacity building for a European graduate tracking initiative: Task 2 – Country roadmaps summary report (Ref EAC/02/2019). Retrieved from https://education.ec.europa.eu/document/capacity-building-for-a-european-graduate-tracking-initiative-task-2-country-roadmaps-summary-report

Section 2 - Positioning the GRINS "Database on University Students" in the European Landscape

Positioning the "database on university students" GRINS project within the European landscape requires situating the project against the main families of longitudinal data infrastructures currently used to monitor educational pathways and education-to-employment transitions. The GRINS project builds a longitudinal dataset by integrating university administrative records on students' academic careers with labour-market information (via AlmaLaurea), overcoming the persistent fragmentation of these sources and enabling a coherent reconstruction of students' trajectories over time.

Moreover, the GRINS project is designed to further extend the observable trajectory by linking university careers to prior schooling and standardized learning outcomes through the National Student Registry of the Ministry of Education (MIM) and INVALSI data, thereby supporting analyses that span school, higher education, and early labour-market outcomes within a unified data architecture. Building on this scope, the present section maps European initiatives along two broad domains: (2A) educational trajectories initiatives and (2B) education-to-employment longitudinal initiatives.

(2A) Educational trajectories initiatives

As a first step in positioning the GRINS project at the European level, we search for and review initiatives that **track school student cohorts and their transitions across educational stages** in diverse institutional and national contexts. The aim of this mapping is to provide valuable insights into the types of data used to monitor educational trajectories. Accordingly, we distinguish:

2A1) Initiatives tracking students' progression within the school system (from primary to upper-secondary);

2A2) Initiatives tracking students' progression from school to university (without covering labor-market outcomes);

2A1) Initiatives tracking students' progression within the school system

(longitudinal tracking of students at the upper-secondary, without linking them to university or labor-market data)

LEARN – Longitudinal Educational Achievements: Reducing Inequalities (Horizon Europe)

Scope: mapping and collecting existing regional or national longitudinal data, allowing for the follow-up of individual cohorts of students over time, and allowing for the analysis of their learning outcomes and trends in educational inequalities.

Context: Germany, Finland, Italy, Romania, Estonia, the Netherlands, and Ireland.

LINEup – Longitudinal data for INequalities in Education (Horizon Europe)

Scope: mapping and exploring longitudinal datasets on students' learning outcomes at primary and secondary levels across Europe.

Context: covered 32 countries: the 27 EU Member States, three EEA-associated countries (Iceland, Liechtenstein, and Norway), as well as Switzerland and the United Kingdom.

MapIE – Mapping Longitudinal Data of Inequalities in Education (Horizon Europe)

Scope WP 4 "Data Mapping and Data Management": mapping longitudinal studies and registry data addressing educational inequalities and compensatory measures in Northern and Central Europe and creating a public MapIE Data Catalogue ensuring that ethical and privacy concerns are addressed.

Scope WP 5 "Effective Interventions and Policies Addressing Educational Inequalities": Develop a methodological framework for analyzing longitudinal datasets in the partner organizations. Analyze the available data to identify and compare factors that cause inequalities and to identify effective interventions and policies compensating for them in and across partner countries, with the goal of describing trends in educational inequalities. To coordinate and implement international comparative data analyses. To coordinate the publication process of the empirical results of MapIE.

Context: Finland, Sweden, Norway, Germany, and Hungary.

REVERS-ED - Trends on educational inequalities over time and successful interventions that contribute to reverse them (Horizon Europe)

Scope: mapping and analyzing techniques used to assess inequalities in education, training, and learning achievements over time, identifying their main strengths and weaknesses. Furthermore, it aims at mapping existing longitudinal datasets in Europe (both national and regional) on learning outcomes and identify those that allow for an analysis of trends in educational inequalities.

Context: Spain, Lithuania, Belgium, Greece, Italy, Romania, Finland, Bulgaria, Portugal, Ireland, Denmark.

STRIDE - Strategies for Achieving Equity and Inclusion in Education, Training and Learning in Democratic Europe (Horizon Europe)

Scope: analyses of education reforms in national and regional systems, of existing large-scale educational assessment, and longitudinal data on the causal link between educational and other social policies and inequalities in educational achievements. It focuses on the range of intersectional variables, such as socio-economic background, gender, (dis)abilities, migration status, home language, early childhood education and care (ECEC) attendance, which may affect learning outcomes in different ways across various contexts.

Context: Norway, Greece, Denmark, Belgium, Hungary, Poland, United Kingdom.

2A2) Initiatives tracking students' progression from school to university

NCO – Dutch National Cohort Study on Education

Scope: The national dataset links school-career data, family and socioeconomic administrative records, school-level characteristics, and standardized assessment results for full student cohorts. It consists of three integrated pillars:

- Student trajectories (school → upper-secondary → tertiary education) combined with rich administrative microdata from Statistics Netherlands (age, gender, parental education, SES, income, wealth, household characteristics, migration background, regional variables).
- School-level administrative information, including school size, location, governance, and inspectorate data, with future extensions planned on school processes and quality.

– Standardized student performance data, drawn from mandatory national assessments in primary schools (reading, spelling, mathematics), allowing the measurement of learning growth from ages 8 to 12.

Context: the Netherlands

BRIDGE - Building Resilient Individuals Through Effective Gradual Educational Transitions

Scope: The BRIDGE's project aim is to improve participation and completion rates in upper secondary and tertiary education in Europe and to promote more effective educational choices, by providing rigorous evidence on policies and practices that promote more effective education and labour market transitions. BRIDGE provides insights into both cognitive and non-cognitive aspects of schooling transitions and assesses the impact of education and training policies on enhancing learning attainments and labour market performance. It is also committed to producing robust recommendations for education and training policies, which will strengthen quality education and result in less inequality in Europe.

Context: Belgium, Italy, Netherlands, United Kingdom, Estonia

Estonian Education Information System (EHIS)

Scope: national longitudinal administrative system integrating student-level data from preschool, primary, lower-secondary, upper-secondary, vocational, and higher education. Through linkages with other administrative registers (Population Register, Register of Taxable Persons, Register of Business, Register of Professions), EHIS can be used for extended analysis, including employment outcomes.

Context: Estonia

The National Educational Panel Study (NEPS)

Scope: describe and explain competence development, influencing factors, educational processes, their conditions, outcomes and consequences over the entire life course. The NEPS provides research data for the entire range of educational stages by investigating individual competences and educational trajectories in a longitudinal multi-cohort study design. Six NEPS starting cohorts (SC1 to SC6) were started between 2009 and 2012 with nationwide representative samples. In 2022, the NEPS was extended by a new starting cohort -- SC8 follows children and adolescents from the 5th grade onwards.

Context: Germany

TIMSS 2023 Longitudinal Study

Scope: optional extension of TIMSS 2023 explored student learning gains over one year of schooling. Countries participating in the TIMSS 2023 Longitudinal Study re-assessed their original sample of TIMSS 2023 students for a second time in 2024, to create two data points of student achievement. Students, parents, teachers, and principals also completed contextual questionnaires, enabling exploration of how learning environments, resources, and student experiences relate to achievement growth.

Context: Georgia, Italy, Jordan, the Republic of Korea, Kosovo, Montenegro, North Macedonia, Slovenia, and Sweden

The OECD Career Readiness project

Scope: uncover patterns of attitudes and activities that are associated with better transitions into employment from a unique analysis of multiple national longitudinal datasets.
Specifically, the working paper "Indicators of teenage career readiness: An analysis of longitudinal data from eight countries" analyses data from ten national longitudinal datasets from eight different countries: Australia, Canada, China, Germany, Korea, the United Kingdom (two datasets), the United States (two datasets) and Uruguay. These are cohort surveys that follow large numbers of people as they move from childhood and their teenage years into adulthood. By following such samples of young people into their twenties, it becomes possible to identify evidence of the impact of teenage career-related activities and experiences in the labour market.

Context: Australia, Canada, China, Germany, Korea, the United Kingdom, the United States and Uruguay

TALIS-PISA link database

Scope: It is a unique dataset that links the rich data surrounding mathematics teachers' practices collected by TALIS 2013 (Teacher and Learning International Survey) with the data collected by PISA 2012 (Programme for International Student Assessment) on the mathematics proficiency and non-cognitive skills of 15-year-old students, as well as information on their family and school background. Eight countries decided to participate in the TALISPISA link option of the TALIS 2013 study: Australia, Finland, Latvia, Mexico, Portugal, Romania, Singapore and Spain. The integrated dataset is the ideal tool to answer the following questions: Which teaching strategies are associated with better student outcomes? Which characteristics of teachers, students, and schools are associated with the regular use of teaching practices strongly associated with student outcomes?

However, an important limitation of the study is that the link between the TALIS and the PISA surveys operates at the school level and not at the classroom level. This means that no direct relation can be drawn between a teacher and his/her students.

Context: Australia, Finland, Latvia, Mexico, Portugal, Romania, Singapore and Spain

(2B) Education-to-employment longitudinal initiatives

As a second step in positioning the Grins project at the European level, we search for and review initiatives that track students' educational pathways together with their transitions into employment. Accordingly, we distinguish between two categories:

2B1) Academic-career and employment (HE → labor market);
2B2) Education-career, academic-career, and employment (school → HE → labor market)

These initiatives most closely resemble the GRING project, providing comparative evidence on the value of integrating multiple data sources for studying student trajectories.

2B1) Academic-career and employment

EUROGRADUATE Survey – Tracking Graduate Outcomes Across Europe

Scope: monitors the educational pathways of recent graduates, how they evaluate their study experiences, and how this translates (1 and 5 years after they graduated) into their professional careers and lives as European citizens.

Context: 18 European Countries

Longitudinal Education Outcomes (LEO), UK

Scope: national administrative dataset that links higher-education student records with tax, earnings, and employment data from HMRC (His Majesty's Revenue and Customs) and benefit records from the Department for Work and Pensions. LEO enables robust longitudinal tracking of graduates' labor-market outcomes, including employment, earnings, and career trajectories after higher education.

Context: UK

2B2) Education-career, academic-career, and employment

MOBYSU.IT database

Database MOBYSU.IT [Mobilitá degli Studi Universitari in Italia], research protocol MUR - Universities of Cagliari, Palermo, Siena, Torino, Sassari, Firenze, Cattolica and Napoli Federico II, Scientific Coordinator Massimo Attanasio (UNIPA), Data Source ANS-MUR/CINECA

Scope: collect data from high school to job placement, by focusing on micro-data life course analysis of university student mobility and its impact on the Italian North-South divide. The main objective is to analyse student migrations from the South to the central and northern regions of the country, while observing other mobility flows within the country and to other countries. Furthermore, it integrates AlmaLaurea database, which provides information about graduates' job placements.

Context: Italy

Educational Longitudinal Database (ELD)

Scope: follow individual learners over time across different stages of education and into the labor market. The ELD is constructed by matching pseudonymized learner records from multiple administrative sources, enabling the analysis of long-term outcomes for those who complete secondary education, further education, higher education, or apprenticeship programmes.

Context: Ireland

National Statistical Institutes (NSIs) of Nordic Countries

The national statistical institutes of Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) rely on a comprehensive register-based system — covering education, labor market, income, housing, and family registers — that is linked via a unique personal identifier. This allows the construction of individual-level longitudinal micro-data spanning from school age through education and labor-market participation.

- *Statistics Denmark*
- Statistics Finland
- *Statistics Iceland*
- *Statistics Norway*
- Statistic Sweden

EDU-LAB (Horizon EU Grant Agreement # 101177428, launched 2025)

Scope: Examine how young people (15–30) move through education and training into employment across Europe. The consortium counts 11 partners from 9 countries (including the UK and Kosovo) and works with stakeholders at every level. Among the aims of the project, there is to map how people progress from education into the labour market, and to identify the main drivers among personal and social factors that shape these journeys (this will lead to the first WP of the projects). Next, they will evaluate the efficacy and efficiency of policies and different funding systems (WP2). Finally, they will complement these administrative data with the OSES Delphi survey of policymakers, educators, employers, youth organizations, and other stakeholders and will run case studies in 2 regions across 7 countries (WP3 and WP4).

Context: European Union Members

Poland's Graduate Tracking System (*Monitoring Karier Absolwentów*)

Scope: Poland's graduate tracking system has been launched in 2016 to monitor the career and education trajectories of all secondary school graduates, including those from vocational education and training (VET). Managed by the Educational Research Institute National Research Institute (IBE PIB) with the Ministry of National Education, it started with survey data. In 2021 its first expansion, with the full coverage of all secondary graduates and career monitoring made a statutory responsibility. Next, it expanded to track graduates over several years, producing five-year post-graduation analyses and detailed regional and sectoral reports.

As of the 1st of September 2025, is has further expanded by introducing new data streams. These include indicators on graduate mobility, special educational needs (SEN), employment quality, and sectoral integration. By linking external examination results to career outcomes, policymakers can assess the long-term impact of early educational achievements.

This upgrade, fully integrated into the 2026 monitoring cycle, will enable precise measurement of regional skills imbalances, inclusion policy effectiveness, and job quality, integrating administrative data to provide comprehensive, population-wide intelligence—avoiding the limitations of surveys, such as low response rates.

To maximise data utility and accessibility for all stakeholders. By late 2025, interactive reports for municipalities and counties will improve local decision-making. An EU-funded project, led by the IBE PIB, aims to provide dynamic tools for students, parents, and counsellors by 2028, ensuring the

system remains a cornerstone for evidence-based policy and skills matching, social inclusion, and sustainable economic growth.

Context: Poland

Integrated Higher Education Graduate Tracking Database (Diplomás Pályakövető Rendszer)

Scope: The Integrated Higher Education Graduate Tracking Database (Diplomás Pályakövető Rendszer, IHGTD) combines information on graduates' careers with administrative data from the Higher Education Information System, the database of the Hungarian Tax Office, and the PES. The IHGTD provides skills intelligence through matching education and employment data. By looking at types of degree courses that graduates pursued and comparing this with their subsequent employment, a detailed picture of graduates' entry to, and progression through, the labour market is provided. The database consists of four different research modules, questionnaires conducted yearly based on different population with different data collection methods, and linked with administrative data. The administrative data integration is an annual, fact-based research that helps us to understand the labour market situation of graduates in higher education. Our questionnaire research is also repeated annually, and we conduct studies involving both students and recent graduates in Hungarian higher education. Our aim is to make the career tracking data we handle publicly available and freely searchable.

Context: Hungary

Vocational education graduate tracking

Scope: Vocational education graduate tracking produces data on the economic activity of graduates, the occupation and business sector of employees, income, as well as emigration. Data are produced for all vocational education institutions, for all study programmes. Data on each graduate are prepared ten years after graduation. The data are produced in accordance with the Cabinet Regulations No. 276 Regulations of the State Education Information System. Administrative data from the Ministry of Education and Science, the State Revenue Service, the State Employment Agency and the Office of Citizenship and Migration Affairs are used for the preparation of the data.

Context: Latvia

Working and Learning in a Changing World (ALWA) and ALWA survey data linked to administrative data of the IAB (ALWA-ADIAB)

Scope: 'Working and Learning in a Changing World', ALWA derived from its German name 'Arbeiten und Lernen im Wandel' for short, is a data set which was collected on behalf of the research department 'Education and Employment over the Life Course' of the Institute for Employment Research (IAB) in Nuremberg within the project 'Qualifications, Competencies and Working Lives'. The ALWA-data contain information about more than 10.400 life histories and allows detailed longitudinal analysis in particular about schooling and training decisions, labour market re-entries and labour market behaviour as well as about processes of family formation and regional mobility.

The basic population consists of all German residents born between 1956 and 1988 irrespective of their spoken language, nationality and employment status.

ALWA-ADIAB makes it possible to analyze survey and administrative data for the ALWA respondents simultaneously. The linked administrative data set contains both variables with individual characteristics and characteristics of the establishments the respondents work at. The ALWA study's comprehensive data on schooling and training decisions, labour market behavior, and regional mobility are supplemented by and can be cross-checked with the administrative data on employment careers, and vice versa. The administrative individual data include information on spells of employment, benefit receipt, and job search and are complemented by information about the establishments ALWA respondents work at.

Context: Germany

Section 3 - Selected Research Projects

The extended abstracts included in this section should be read as illustrative examples of research directions potentially enabled by the GRINS "Database on University Students". Their purpose is to highlight thematic areas and analytical opportunities, rather than as claims over specific research topics. The dataset is designed to support multiple perspectives and parallel investigations on related issues, allowing different scholars to engage with overlapping themes using distinct questions, methods, and theoretical lenses.

Some of the research designs outlined in the extended abstracts envisage the integration of additional data sources (e.g., MIM or INVALSI), whose availability and degree of integration will depend on the evolution of institutional and organizational arrangements. Accordingly, the abstracts should be interpreted as illustrative analytical frameworks rather than as fixed empirical blueprints. The extended abstracts are numbered and presented in alphabetical order based on the authors' institutional affiliations.

Abstract 1, authored by Fabio Farella and titled *Inequality of Opportunity and Efficiency in Tertiary Education: Evidence from Italian Universities*, examines the relationship between inequality of opportunity and efficiency in tertiary education at the university level. Using individual-level administrative data, supervised machine-learning techniques, and a two-stage data envelopment analysis, the study estimates inequality of opportunity in access to higher education and evaluates how efficiently universities use resources to equalize opportunities. The project provides novel rankings of universities' capacity to promote equity and examines potential trade-offs with efficiency, offering policy-relevant insights into the allocation of public resources in higher education systems.

Abstract 2, authored by Annalisa Cristini, Federica Origo, Piera Bello, and Costanza Marconi and titled *When Research Meets Teaching: Evidence from Student Level Data*, examines how the alignment between university instructors' research agendas and the content of the courses they teach affects student performance. Using administrative student records linked to publication data and text-based similarity measures, the study exploits within-student and within-teacher variation to identify causal effects. The findings highlight that closer alignment between research and teaching enhances student achievement, particularly in advanced courses and for less-prepared students, shedding light on the mechanisms through which universities transmit frontier knowledge.

Abstract 3, authored by Annalisa Cristini, Federica Origo, Piera Bello, Elena Pisanelli, and Costanza Marconi and titled *Mind the Expectation Gap: Gender Differences in Career Expectations*, examines whether gender gaps in career expectations emerge before labor-market entry and how they translate into early-career outcomes. Combining survey data on subjective expectations with administrative records, the study tests whether beliefs predict realized outcomes and evaluates the role of information frictions through a randomized information experiment. By comparing factual labor-market information with AI-mediated guidance, the project provides new evidence on how expectations are formed and revised, with implications for gender inequality and education-to-work transitions.

Abstract 4, authored by Annalisa Cristini, Federica Origo, Piera Bello, Elena Pisanelli, and Costanza Marconi and titled *Surnames, Ancestral Gender Norms, and the Returns to Academic Excellence*, investigates how historically rooted gender norms shape the labor-market returns to academic excellence. Linking detailed university performance records to early-career outcomes, the study combines regression discontinuity designs and instrumental-variable approaches with a surname-based proxy for ancestral gender norms. The project identifies gendered differences in the valuation of academic signals and contributes to understanding why educational achievement does not translate uniformly into labor-market rewards.

Abstract 5, authored by Magalì Fia, Giulia Leoni, Toloue Miandar, and Angelo Paletta and titled *Responsible Management Competencies and Higher Education: Managerial Perspectives, Educational Implications, and the Potential of the GRINS Student Database*, examines how responsible management is conceptualized by practicing managers and how higher education institutions contribute to the development of related competencies. Combining qualitative and quantitative methods and leveraging the GRINS student database and corporate governance data, the study explores the alignment between managerial expectations, educational trajectories, and student competencies, as well as the educational patterns associated with access to leadership positions. The project provides empirically grounded insights for curriculum design, institutional strategies, and education policy.

Abstract 6, authored by Margherita Fort, Gonçalo Lima, and Veronica Rattini, and titled *College Curricula, Skills, and Labor Market Outcomes* studies how the content and design of university curricula shape students' skill acquisition, educational choices, and early labor market outcomes. Using newly collected data on the curricular structure of Italian higher education programs, combined with student-level university records and post-graduation outcomes from AlmaLaurea,

the study characterizes degrees in terms of the skills they are designed to deliver and their curricular organization. The findings shed light on how differences in curriculum content and structure affect sorting into fields of study, inequality in skill formation, and early career trajectories.

Abstract 7, authored by Margherita Fort, Annalisa Loviglio, Veronica Rattini and Vincenzo Scrutinio, and titled *Value Added in Education: School Effectiveness and Degree-Program Performance Using Longitudinal Administrative Data* evaluates the contribution of secondary schools and university degree programs to students' academic outcomes using longitudinal administrative data and standardized test scores. By distinguishing between school value added—measured through test score growth—and degree-program value added—measured through adjusted academic progression—the study provides a unified framework for assessing institutional effectiveness across educational stages. The results inform debates on school quality, higher education performance, and evidence-based evaluation of educational institutions.

Abstract 8, authored by Margherita Fort, Gonçalo Lima, Annalisa Loviglio, Veronica Rattini and Vincenzo Scrutinio, and titled *Understanding Peer Effects in Education: Evidence from School and University Transitions* examines how peers influence students' academic performance, educational choices, and longer-run outcomes across the educational pipeline. Using linked standardized test scores, school records, university administrative data, and post-graduation outcomes, this project will exploit institutional features of the educational career progression structure in Italy at different stages focusing on the implications of the relative position of an individual in the relevant peer group and constructing and exploiting measures of cumulative exposure over the educational career. It will consider alternative definitions of peers to potentially inform about mechanisms driving peer effects. Ultimately, the project aims at assessing the value of peers.

Abstract 9, authored by Adriana Di Liberto and Elisa Melis and titled *Gender Bias in Teachers' Grading and Educational and Labor Market Outcomes*, examines how gender-biased grading practices affect students' educational trajectories and early labor-market outcomes. Using linked administrative data spanning compulsory schooling, higher education, and employment, the study compares teacher-assigned grades with standardized test scores to identify bias and trace its long-term consequences. The project contributes to understanding how early educational signals shape gender inequalities over the life course.

Abstract 10, authored by Pasquale Sannino, Cristina Davino, Rosa Fabbricatore, and Rosaria Romano and titled *The Effect of the No-Tax Area on Earned University Credits: A Regression Discontinuity Approach*, evaluates the impact of tuition fee exemptions on students' academic

progress. Exploiting income-based eligibility thresholds, the study applies a regression discontinuity design to estimate the causal effect of the no-tax area policy on earned university credits. The analysis also explores heterogeneity across departments to identify potential variations in treatment impact among different academic contexts within the same university.

Abstract 11, authored by Cristina Davino, Rosa Fabbricatore, and Rosaria Romano and titled *Understanding Educational Poverty: Insights into Youth Opportunities*, develops a multidimensional framework to conceptualize educational poverty as limited access to educational opportunities across family, school, and environmental contexts. Drawing on Sen's capability approach and individual-level indicators, the study models educational poverty as a latent construct and examines its relationship with cognitive and non-cognitive outcomes. The project provides an assessment tool to support targeted education policies aimed at reducing inequality and enhancing youth opportunities.

Abstract 12, authored by Cristina Davino and Rosa Fabbricatore and titled *Understanding Student Mobility in the Bachelor–Master Transition*, investigates the determinants of geographic mobility among students transitioning from bachelor's to master's programs. Combining administrative microdata with institutional and territorial indicators, the study analyzes mobility patterns through the lenses of human capital, signaling, and preference-based theories. The findings offer policy-relevant insights into how mobility choices interact with inequality, regional development, and institutional attractiveness.

Abstract 13, authored by Maura Mezzetti and Daniela Vuri and titled *Mapping Academic Performance through School History*, examines how students' prior educational trajectories shape academic performance during university. Using longitudinal administrative data and sequence analysis, the study jointly analyzes progression speed and performance quality across fields of study. The project provides new evidence on path dependencies in education and informs policies aimed at improving efficiency and equity in higher education systems.

Abstract 14, authored by Daniela Vuri and Marianna Brunetti and titled *Family Legacy and Field of Study/Career Choices by Gender*, investigates how family background influences field-of-study and career choices differently for women and men. Linking university records with labor-market outcomes, the study distinguishes educational inheritance from occupational inheritance and examines gendered transmission mechanisms. The project offers insights into how family legacy contributes to persistent gender gaps and informs policies promoting equal opportunity.

Abstract 15, authored by Margherita Fort, Gonçalo Lima, Annalisa Loviglio, Veronica Rattini, Vincenzo Scrutinio, Daniela Vuri and titled *How Classroom and School Peers Shape Students' Future Choices and Success*, examines the long-term effects of peer composition in primary and secondary school on university outcomes. Using linked standardized test scores, school records, and university administrative data, the study exploits quasi-random variation in classroom assignment to identify peer effects. The findings contribute to explain how early peer environments shape educational trajectories and contribute to the persistence of inequality.

Abstract 16, authored by Daniela Vuri and Vincenzo Atella and titled *A Hurdle Race: How Barrier Exams Shape University Careers*, investigates how gateway exams and retake structures influence students' academic trajectories in the Italian university system. Using detailed exam-level administrative data, the study analyzes short-term progression, dynamic academic behavior, and long-term outcomes such as time-to-degree and dropout. The project provides evidence to inform assessment design and progression rules in higher education.

Abstract 1

Inequality of Opportunity and Efficiency in Tertiary Education: evidence from Italian Universities

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Improving equity and efficiency in tertiary education is critical for promoting social mobility and long-term economic growth. Measurable educational outcomes are not the sole metric to assess educational systems, schools are also important for equity or equality of opportunity (Sutherland, 2023). Despite its importance, most empirical literature treats educational equity and efficiency separately. If societies aim to maximize equality of opportunity, it becomes essential to study how public resources are used to reduce this inequality. This research aims to fill this gap by investigating for the first time the relationship between inequality of opportunity (IOp) and efficiency in tertiary education at univeristy level. This analysis offers two main contributions. First, new estimates of inequality of opportunity (IOp) in tertiary education using an individual level indicator capturing access to university are derived from two supervised machine learning algorithms (Conditional Inference Trees and Random Forests). This allows us to capture complex, nonlinear relationships between student outcomes and circumstances. Recent literature (Brunori et al., 2019) has shown that these algorithms outperform classical methods in predicting unfair inequality, making the ranking more robust. In this context, one of the most informative indicators is student enrollment disaggregated by socio-economic status (SES). Second, a cross-university ranking of efficiency in equalizing opportunities is obtained using a two-stage data envelopment analysis (DEA) approach. The OECD Education at a Glance database provides standardized country-level information on student-teacher ratios, number of teachers, class sizes, and exogenous indicators that could be used in the second stage of the DEA analysis. First, IOp is estimated using the parametric ex-ante approach of Ferreira and Gignoux (2011). The predicted values from a probit regression are used to compute a dissmilarity index (IOp index). Next, we apply machine learning methods, specifically Conditional Inference Trees (ctree) and Random Forests (cforest), which can handle nonlinear interactions between circumstances and outcomes (Brunori et al., 2023). The conditional inference tree (ctree) algorithm is a recursive partitioning method that builds a tree structure by splitting the sample into subgroups (nodes) based on statistically significant associations between the outcome variable (here, test scores) and the individual's circumstances (e.g., parental education, etc.). This results in a tree structure where each terminal node defines a "type", grouping together individuals who share same combinations of circumstances. Each individual is then assigned the mean outcome of their respective type. The conditional inference forest (cforest) extends this idea by constructing an ensemble of trees, introducing random subsampling of the covariates at each node. For each individual, the predicted value is obtained by averaging the predicted means across all trees. Finally, inequality of opportunity is computed applying an inequality index to the counterfactual distribution of the predicted outcomes. To measure how efficiently countries reduce IOp, we use a two-stage DEA model. Since educational funding is determined through political decision-making, the goal of education systems is to achieve better outcomes while making efficient use of the available resources (Agasisti, 2014). In the first stage, each inequality index is inverted by subtracting it from its theoretical maximum value, so that higher values of the index indicate greater equality. Then we use a country-level input (e.g., number of theachers for each univerisy) to estimate efficiency. The DEA model is

output-oriented and uses Variable Returns to Scale (VRS). In the second stage, output efficiency scores are regressed on environmental factors with a Tobit model. Despite similar levels of input, universities may display wide differences in their capacity to equalize opportunities. Machine learning estimates of IOp are expected to yield more robust and accurate country rankings compared to traditional methods, in line with the findings of Brunori et al. (2019). Overall, these findings will shed light on whether secondary educational systems can simultaneously promote efficiency and fairness and will help identify the policy strategies that better support both goals.

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Abstract 2

When Research Meets Teaching: Evidence from student level data

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Universities are central institutions for both the production and the diffusion of new knowledge. Faculty members are simultaneously researchers, engaged in advancing the scientific frontier, and teachers, responsible for transmitting knowledge to students. While these two roles are formally complementary, the actual relationship between research and teaching remains an open empirical question. A growing body of work examines whether research activity enhances or detracts from teaching quality (Rodrìguez and Rubio, 2016; Garcìa-Gallego et al., 2015). A key argument in favor of complementarity is that research-active instructors may introduce more recent ideas into their courses, thereby facilitating the diffusion of innovation within higher education (Biasi and Ma, 2022). At the same time, research productivity may also crowd out teaching effort (Braga et al., 2014) or interact non-linearly with pedagogical effectiveness (Artés et al., 2017). Thus, understanding when and how research affects teaching remains essential for evaluating the role of the university as a vehicle of knowledge transmission. Prior work has linked student outcomes to various instructor characteristics, including subject-matter knowledge and formal qualifications (Gonzàlez-Regalado, 2025; Sancassani, 2023), cognitive skills and academic records (Bhai and Horoi, 2019; Hanushek et al., 2016), employment conditions such as tenure status (Figlio et al., 2015), and demographic match between students and instructors (de Gendre et al., 2024; Gershenson et al., 2022). A more recent strand of research explicitly examines the dual role of university faculty as researchers and teachers by focusing on the effect of research productivity (Palali et al., 2018; Nur-tegin et al., 2020). Within this literature, findings remain mixed: research productivity may enhance teaching by bringing more current knowledge to the classroom, but it may also reduce effectiveness when high-impact research crowds out time and effort devoted to students (Coccorese et al., 2024).

We advance this literature by providing the first empirical evidence that the match between what instructors research and what they teach plays a central role in shaping student achievement in higher education. By shifting attention from how much faculty publish to what they research in relation to what they teach, we identify a previously overlooked channel through which new knowledge is transmitted to students. We hypothesize that instructors who teach courses closely related to their research interests deliver higher quality teaching because alignment enables deeper subject-matter expertise, more recent knowledge, and greater intrinsic motivation. To test this mechanism, we construct a text-based measure of similarity between each instructor's recent publications and the syllabi of the courses they teach. We use detailed administrative data from a large Italian university between academic years 2015/16 and 2023/24 and link these data to instructors' publication records obtained from the Scopus database.

Our empirical strategy exploits within-student and within-teacher variation, an approach that mitigates the main sources of selection bias, including student sorting, instructor teaching style, and time-invariant differences in research productivity.

Our results show that greater alignment between an instructor's research agenda and the content of the courses they teach is associated with higher student performance. Students earn higher grades and are more likely to pass exams when taught by instructors whose research is closer to the course material, even after controlling for research productivity, teaching load, course characteristics, and

student background. Moreover, the effect is stronger for courses at more advanced levels and for students with lower prior preparation, suggesting that alignment facilitates the diffusion of recent knowledge and supports students who benefit most from structured guidance. These findings indicate that the transmission of new ideas into higher education is not automatic but depends critically on whether instructors teach what they know best.

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Abstract 3

Mind the Expectation Gap: Gender Differences in Career Expectations

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Gender gaps in labor-market outcomes remain substantial, even among highly educated cohorts. A growing literature suggests that part of these gaps originates before labor-market entry, through differences in information, aspirations, confidence, and perceived constraints (Bertrand, 2011; Goldin, 2014; Coffman, 2014). This project asks whether gender gaps in career expectations emerge already during the transition from university to work, and whether they become self-fulfilling—that is, whether early beliefs predict later outcomes even among students with similar observable characteristics and academic performance. We survey final-year Italian university students to elicit expected earnings, promotion prospects, job attributes (e.g., stability, flexibility, prestige), perceived discrimination, intended sector/occupation choices, and subjective probabilities over outcomes. Our expectation elicitation follows established approaches in the subjective expectations literature (Arcidiacono et al., 2012; Attanasio and Kaufmann, 2014; Wiswall and Zafar, 2015; Zafar, 2013). Survey respondents are then linked to AlmaLaurea administrative records one and three years after graduation, allowing us to compare stated expectations to realized early-career outcomes (employment, contract type, sector/occupation, and earnings).

The first empirical objective is descriptive: we estimate gender differences in expectations at the brink of labor-market entry while controlling for field of study, institution, region, family background, and academic performance. The second objective is behavioral: we test whether baseline expectations predict realized early outcomes after graduation, and whether the mapping from beliefs to outcomes differs by gender among observationally similar students. Such differences may reflect constraints, differential bargaining, discrimination, or different returns to job-search investments.

A core innovation is a randomized information experiment embedded in the survey, designed to probe whether expectation gaps are driven by misperceptions about labor-market fundamentals or by more persistent narratives and stereotypes. Students are assigned to one of two treatments. In the factual information arm, they receive concise, field-specific labor-market facts about comparable graduates (e.g., distributions of wages and employment probabilities and indicators of career progression). Conceptually, this provides a standardized, verifiable public signal about the "common" component of opportunities, and should be especially effective if expectation gaps primarily reflect information frictions.

In the second arm, students receive access to ChatGPT as a labor-market Q&A tool, enabling low-cost, interactive queries (e.g., typical entry jobs by field, wage growth, hiring channels, internships, negotiation, skill requirements, and trade-offs between public and private careers). The theoretical motivation for comparing these two modes of information provision draws on the logic of information cascades (Bikhchandani et al., 1992; Banerjee, 1992; Anderson and Holt, 1997; Goeree et al., 2007). When individuals rely heavily on socially transmitted narratives (from peers, families, and salient stereotypes), belief formation may resemble cascade-like dynamics in which common, highly salient signals dominate private information and objective evidence. In such settings, a single standardized factual update may be insufficient if it is weakly attended to or interpreted through existing frames. By contrast, interactive AI-mediated information may generate

salient, tailored signals that can prompt exploration and belief revision for students who would otherwise not search for information, potentially helping them break away from inherited narratives.

Adding AI information can help decision-makers escape cascade-like outcomes even when the AI signal is biased, because sufficiently strong signals about idiosyncratic differences can overturn choices driven by history or stereotypes (Pisanelli and Schram, 2025). Translating to our context, ChatGPT access may reduce the cost of asking questions and increase engagement, but it may also inject noise, framing, or bias, raising the possibility that it narrows or widens gender gaps depending on baseline beliefs and how students use the tool. This concern aligns with a broader literature emphasizing that algorithmic systems trained on historical data can replicate or amplify existing inequalities (Barocas and Selbst, 2016; O'Neil, 2017; Tambe et al., 2019; Bogen and Rieke, 2018; Gebru, 2020).

We estimate intention-to-treat effects of each arm on expected earnings and job attributes, perceived discrimination, subjective probabilities, and belief accuracy relative to administrative benchmarks. We also examine heterogeneity by baseline misperceptions, gender, field of study, and socioeconomic background, and we link treatment-induced belief changes to subsequent job-search choices and realized outcomes. By contrasting a high-precision factual update with an interactive AI-mediated information environment, the design aims to separate calibration of measurable labormarket fundamentals from shifts driven by exploration, salience, and the potential breaking (or reinforcement) of narrative-driven expectations (Pisanelli and Schram, 2025).

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Abstract 4

Surnames, Ancestral Gender Norms, and the Returns to Academic Excellence

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Women increasingly outperform men in higher education, yet labor markets often reward their academic achievements less. This paper investigates whether historically rooted gender norms transmitted through family ancestry can help explain why returns to excellence differ by gender, and whether surname-linked channels can further distort meritocratic evaluation at labor-market entry. The premise is consistent with evidence that cultural origins and inherited norms can shape economic behavior even after migration and geographic mobility (Giuliano, 2007; Alesina et al., 2013; Fern´andez, 2013), and with work documenting gendered differences in competition and related behaviors that may interact with social environments (Niederle and Vesterlund, 2007).

We link rich administrative records on Italian university graduates—including course grades, honors, time to degree, thesis outcomes, and (where available) information on exam retakes—to early-career outcomes. To capture academic performance net of strategic exam-taking, we construct an adjusted GPA measure that penalizes repeated attempts by attaching a cost to retakes, aiming to better approximate underlying mastery and effort. We then introduce a surname-based Ancestry Norm Score (ANS) using the historical geography of surnames to proxy ancestral exposure to traditional gender norms; because surnames exhibit geographic persistence, ANS can capture inherited cultural environment even when individuals move, and movers help separate ancestral from contemporaneous influences.

A key empirical challenge is that grades and honors are endogenous to ability, effort, and course selection. To estimate the causal returns to academic excellence, we combine complementary quasiexperimental designs commonly used in the evaluation of discontinuous academic signals. First, we exploit regression discontinuities around grading and honors cutoffs, comparing students just above versus just below thresholds where formal signals change discretely (Hahn et al., 2001; Lee and Lemieux, 2010). Second, we implement a sharp regression discontinuity at the eligibility threshold for a selective Top 10 Student Program: eligibility is automatically assigned/detected by the university, so treatment status changes mechanically at the cutoff. This generates exogenous variation in access to program-related benefits (formal recognition, signaling, networking, and placement support) and identifies the local causal effect of program assignment on early-career outcomes. Third, we exploit variation in thesis-grading stringency (e.g., differences in evaluators' strictness in the final thesis assessment) as an instrument for the final graduation score, providing quasi-experimental variation in this high-stakes summary signal of academic excellence while leaving the student's underlying coursework profile unchanged.

These designs deliver causal estimates of the labor-market "price" of excellence (wage returns, probability of high-quality jobs, contract stability), separately for raw GPA, adjusted GPA, honors, program assignment, and the final graduation score. We then map heterogeneity in these causal returns to ANS by gender. The core hypothesis is that, in ancestral environments characterized by more traditional gender norms, women may select into different career paths and face different payoffs to excellence due to sorting and self-stereotyping. This can occur even in the absence of differential employer tastes, through choices about occupations, mobility, sector, negotiation, and the intensity of job search and career investment (Alesina et al., 2013; Fern´andez, 2013; Giuliano, 2007; Niederle and Vesterlund, 2007). Consistent with employer learning frameworks, early-career

returns to signals may also differ across environments if individuals anticipate different career horizons or if excellence induces different post-graduation investments (Altonji and Pierret, 2001).

Empirically, we estimate interactions between treatment-induced excellence signals and ANS, allowing flexible differences by gender, field, and local labor-market conditions. We also test whether adjusted GPA is priced differently from raw GPA and whether this differential valuation varies systematically with ANS, shedding light on how norms shape both educational strategies and the translation of academic signals into labor-market outcomes. By connecting inherited norms to the causal returns to excellence, the project contributes to understanding why educational achievement does not translate uniformly into labor-market rewards and how culturally transmitted constraints can persist even when formal evaluation is merit-based (Bertrand, 2011; Goldin, 2014).

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Abstract 5

Responsible Management Competencies and Higher Education: Managerial Perspectives, Educational Implications, and the Potential of the GRINS Student Database

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Responsible Management Education (RME) is a central field within management and sustainability scholarship, aiming to equip future managers with the competencies needed to address complex societal, environmental, and ethical challenges (among others see: Bagley et al., 2020; Abdelgaffar, 2021). According to RME, business education plays a crucial role in developing graduates' formal knowledge, soft skills, critical thinking, sustainability mindset, and stakeholder-oriented business strategies (Nonet et al., 2016; Van der Byl & Slawinski, 2020; Laash et al., 2023). In line with Laasch et al. (2023), we argue that achieving this goal requires, as a first step, identifying a clear set of responsible management competencies. These can then serve as the foundation for formulating intended learning outcomes and selecting appropriate teaching–learning approaches to foster their development. However, the vast majority of RME research adopted a normative approach and is still under development (Abdelgaffer, 2020). Moreover, it is surprising that the managerial-level perspectives on which are the key RM competencies needed in real-world contexts have been largely overlooked (Hodgkinson et al., 2025). In parallel, sustainability science has developed influential frameworks of sustainability competencies, primarily focused on educating sustainability professionals (e.g., Wiek et al., 2011; Rieckmann, 2012; Brundiers et al., 2021). Its key contribution lies in articulating competence frameworks for sustainability professionals while primarily engaging the academic community as providers of expert perspectives. However, its main focus remains on educating future *sustainability professionals* (Brundries et al., 2021), offering a narrower lens compared to the broader concept of a *responsible manager*. Also, while there is a growing convergence around core sustainability competencies, their integration into management education remains fragmented (MacNeil & Khare, 2025), with contributions remaining mostly normative and pedagogical in perspective (Arevalo et al., 2020).

This project addresses these gaps by shifting the analytical lens from prescriptions to practice: from what responsible managers should be, to how managers themselves conceptualize responsible management, and how they assess the role of higher education in fostering the related competencies. The goal is to generate an empirically grounded, practice-informed framework of responsible management competencies and to explore its implications for management education and education policy. In particular, the project is guided by three research questions:

1. How do managers perceive and interpret the role of responsible management and the related competencies?
2. What role can higher education institutions (herafter HEIs) have in supporting the development of these competencies?
3. To what extent are students' competencies aligned with the competencies required for responsible management in organizational practice?
4. Regarding the employability, what are the educational patterns that lead to reaching top-level governance positions (Board of Directors, CEO, control bodies), with particular reference to sustainable businesses?

The project follows a sequential, mixed-methods design. The first phase consists of an exploratory qualitative study based on focus groups and semi-structured interviews with managers operating in both public organizations and private for-profit companies in Italy. The study adopts an interpretive, inductive approach (Dubois & Gadde, 2002; Gioia et al., 2013) and aims to capture how managers

make sense of responsibility, ethics, sustainability, and managerial action in their everyday work. Data are analyzed through a thematic coding process, allowing second-order themes and aggregate dimensions to emerge inductively from the data. This approach enables the development of a practice-based competency framework grounded in managerial experience rather than theoretical prescriptions. Preliminary results identify four interrelated domains that together define the profile of a responsible manager: (1) Ethical thinking and moral judgment, (2) Responsibility toward stakeholders, (3) Sustainability orientation (4) A set of mainstream managerial competencies. These domains are also analyzed in relation to the perceived role of HEIs, highlighting managerial expectations about how such competencies should be developed through formal education.
The second phase builds on the qualitative framework by operationalizing the identified competencies into measurable constructs and integrating them into two complementary survey instruments at the student and managerial levels. The managerial-level survey captures the perceived importance of each responsible managerial competency, the extent to which competencies are integrated into organizational processes, such as recruitment, training, performance evaluation, career development, internal control, and accountability; and the role attributed to universities in fostering their development. On the other hand, the student-level survey aims to target self-assessed competencies, educational trajectories, and backgrounds. This data survey can be linked to the GRINS "database on university students", which provides rich longitudinal and cross-sectional data on useful managerial perspectives on responsible managerial competencies that can be used for comparing them with students' educational outcomes and related pedagogical approaches. This integration enables the empirical exploration of the role of HEIs in developing key competencies, differences across disciplines, institutions, and socio-demographic groups, and the (mis)alignment between students' competencies and those identified by managers as critical for responsible management. The project advances RME and sustainability education research by introducing a bottom-up, practice-based perspective on responsible management competencies, complementing the dominant normative and pedagogical approaches. By leveraging the GRINS student database, the project aims to provide evidence-based insights for education policy and institutional strategy, supporting: (1) curriculum design aligned with labor-market and societal needs, (2) the evaluation of whether universities are effectively fostering responsible management capabilities, and (3) the identification of gaps in competency development across student populations.

A final dimension of the project investigates student employability and leadership trajectories. Through a strategic agreement with InfoCamere, the research will access granular corporate governance data to identify individuals in apical roles, such as CEOs, Board members, and control body representatives. By cross-referencing this with the GRINS database, the project will identify the educational patterns that facilitate entry into top-level governance, particularly within sustainable businesses. This evidence-based approach aims to help HEIs align curriculum design with high-level labor market needs, ensuring future leaders possess the practical pathways to achieve influence in organizations committed to responsible management.

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Abstract 6

College Curricula, Skills, and Labor Market Outcomes

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College curricula codify information on the knowledge and skills that graduates can supply in the labor market. To the extent that curricula signal a particular *bundle* of skills to employers, curricular design should matter for labor market success. Indeed, differences in labor market returns across college majors and fields of study are large--- often comparable to, and sometimes larger than, average college wage premia (Andrews et al. 2024; Bleemer and Mehta 2022; Deming and Noray 2020; Kirkeboen, Leuven, and Mogstad 2016; Altonji, Blom, and Meghir 2012). Moreover, graduates from institutions with curricula closer to the knowledge frontier earn more and are more innovative (Biasi and Ma 2023). Yet systematic evidence on curricula remains scarce, largely because curricular and syllabus information is rarely available in standard surveys and administrative datasets.

In this project, we help fill this gap in three ways. First, we build a novel dataset on the curricular offer of higher education in Italy over the last decade. We leverage comprehensive public information offered in each bachelor's and master's degree in the country, textual descriptions that universities provide for each program, collecting, systematizing and these data into a unified framework. Using program descriptions, we extract skill vectors for each degree based on commonly used dictionaries of skills, such as the European Skills, Competences, Qualifications and Occupations (ESCO) taxonomy and the O*NET framework. Building on the task-based approach for occupational characterization (Autor and Dorn 2013; Autor, Levy, and Murnane 2003), we then construct a parsimonious representation that maps the high-dimensional skill space into broad skill groups that differ in routineness, analytical content, and reliance on social skills. The resulting dataset provides a comprehensive, degree-level description of the skills that Italian higher education programs are designed to deliver.

Second, using the scientific field composition of each program's course menu, we propose two novel measures of curriculum design: (i) curricular diversity, capturing the extent to which programs combine distinct scientific areas rather than specializing narrowly; and (ii) curricular transversality, capturing the extent to which courses that are offered in a given degree are offered in many others. These measures formalize two margins that are likely to matter for sorting and college returns, yet are typically unobserved in the literature. We document substantial heterogeneity in curriculum design across scientific areas: for example, the curricular content of STEM programs tends to be relatively transversal while exhibiting lower curricular diversity. We also study how curricular design varies across universities and how it evolves over time.

Finally, we combine these new data on curricula and skills with student-level information from a large Italian university, including early labor market outcomes from AlmaLaurea. This merged dataset allows us to contribute to work on the determinants of college major choice (Altonji, Blom, and Meghir 2012) and the returns to different degrees (Andrews et al. 2024) by opening up the "black box" of what degrees *contain*. We characterize sorting into degrees in terms of both the skill bundles they offer and their curriculum design, and we study how selection on these dimensions varies by socio-economic background—informing debates on inequality in access to skill formation and labor market opportunities. Moreover, linking curricular skill content to early outcomes

provides a first step toward describing how different skills are priced in the labor market and supply and demand mismatches. A comparative advantage of our setting is that we can separate the role of what is taught (in terms of skills) from how content is organized (curricular design). For instance, we can test whether more diverse curricula improve matching into occupations with more diverse tasks or knowledge requirements, while more specialized programs yield higher returns within occupations with narrower expertise. The longitudinal nature of the dataset allows us to explore heterogeneity across cohorts and labor market conditions, and study whether returns to different skill bundles have shifted over time, consistent with changing skill demand.

Overall, the project provides a new framework and empirical evidence on how curriculum content and design shape major choice, inequality in skill acquisition, and early career trajectories.

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Abstract 7

Value Added in Education: School Effectiveness and Degree-Program Performance Using Longitudinal Administrative Data

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This project develops an observational value-added framework to evaluate educational institutions at two distinct stages of the educational pipeline: secondary schools prior to university enrolment and university degree programs during tertiary education. Using longitudinal administrative data and standardized test scores, the project estimates institutional contributions to student achievement and academic progression, while explicitly accounting for differences in prior preparation and student composition. A central contribution of the project is the clear conceptual and empirical distinction between school value added—where learning gains can be measured using standardized assessments—and degree-program value added, which is interpreted as adjusted academic performance and progression rather than as a direct measure of learning.

In the first stage, the project estimates the value added of secondary schools using longitudinal standardized test scores from the Italian INVALSI assessments in Italian, mathematics, and English. Following the canonical value-added literature in primary and secondary education (Hanushek, 1979; Todd and Wolpin, 2003; Rivkin, Hanushek, and Kain, 2005; Chetty, Friedman, and Rockoff, 2014), school value added is defined as the contribution of a school to students' test score growth conditional on prior achievement and observable characteristics. The availability of repeated, externally standardized test scores allows for a relatively clean interpretation of school value-added estimates as measures of learning gains accumulated during secondary education, net of baseline skills and cohort effects.

In the second stage, the project evaluates degree-program value added within higher education using administrative data on academic outcomes, including credit accumulation, grade point average, progression through the degree program, and completion. Estimating value added at the university level poses substantial challenges due to non-random selection into degree programs, non-standardized grading practices, and heterogeneity in program objectives (Dale and Krueger, 2002; Angrist et al., 2017). The preferred baseline approach follows a residualized-outcomes framework commonly used in observational evaluations of postsecondary institutions (Dale and Krueger, 2002; Deming, 2017; Cunha and Miller, 2014). Students' entry-level preparation is measured using externally comparable and pre-determined indicators, primarily standardized admission test scores (TOLC), where available, and a composite index constructed from INVALSI test scores in Italian, mathematics, and English. These measures are complemented by detailed information on high school background, demographics, and entry cohort. University outcomes are first residualized with respect to these pre-entry characteristics, and the remaining systematic differences across degree programs are attributed to program-level effects.

To further reduce residual selection bias and enhance interpretability, degree-program value added is estimated primarily within fields of study and entry cohorts, ensuring that programs are compared to academically similar alternatives. Moreover, the analysis emphasizes progression-based outcomes—such as credits earned, retention, and completion within expected time horizons—which are less sensitive to grading standards than raw GPA and have been shown to be predictive of longer-term outcomes (Hoekstra, 2009; Angrist et al., 2017).

Given the presence of estimation noise—particularly for smaller degree programs—the project employs shrinkage techniques drawn from the teacher and school value-added literature (Chetty et al., 2014; Kane and Staiger, 2008) to stabilize program-level estimates. Program value added is therefore reported together with measures of statistical uncertainty.

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Abstract 8

Understanding Peer Effects in Education: Evidence from School and University Transitions

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This project studies peer effects in education using a uniquely rich longitudinal dataset, focusing on how the composition and relative position of peers affect students' academic performance, educational choices, and longer-run outcomes. The data allow us to follow multiple cohorts of students from primary and lower secondary school through upper secondary education, university enrollment, academic progression, and early labor market outcomes. The analysis builds on a large economics of education literature documenting that peers influence achievement, behavior, and aspirations, while addressing two central empirical challenges: endogenous sorting into peer groups and the reflection problem (Manski, 1993).

The project exploits the longitudinal test score data to construct longitudinal measures of peer ability, considering institutional transitions and cohort reshuffling at different levels of education in the student's career, which is plausibly orthogonal to unobserved individual ability. This strategy allows identification to rely on variation in peer composition and ability — as measured by standardized test scores or grades —and to distinguish the overall peer effect, between old peers (previously encountered) and new peers (newly assigned), following the logic of Lavy et al. (2012), Feld and Zölitz (2017), and Meschi and Pavese (2023). Moreover, it also examines how exposure to higher-achieving peers, as well as the share of very high- and very low-achieving classmates, affects academic outcomes such as test scores, course performance, progression, and completion. The analysis further allows for nonlinear peer effects by separating average peer achievement from the distributional composition of peers, building on evidence that extreme peers may matter disproportionately (Hoxby and Weingarth, 2005; Lavy et al., 2012; Hanushek et al., 2009). In extensions, the paper studies peer effects related to demographic composition—including gender and immigrant background—drawing on approaches used by Angrist and Lang (2004), Gould et al. (2009), Figlio et al. (2024), and Olivetti, Patacchini, and Zenou (2020). Importantly, the linked data allow us to extend this analysis beyond compulsory schooling to university settings, where peer effects are measured using peers' pre-university achievement, ensuring that peer measures remain predetermined with respect to university outcomes. Moreover, rather than focusing on contemporaneous peer effects alone, we construct cumulative measures of exposure to peer characteristics across multiple schooling stages, following the logic of Figlio et al. (2024). This approach enables us to assess whether early exposure to high-performing or disadvantaged peers has persistent effects on educational trajectories, university choices, and early labor market outcomes. It can thus contribute to the literature that focuses on the role that the timing of events that occur in individuals' life can affect their development trajectories.

The project further focuses on rank-based peer effects, which capture the role of relative position within the peer group rather than peers' absolute characteristics. In particular, we estimate the impact of rank on subsequent performance, educational choices, and outcomes, following Elsner and Isphording (2017), Murphy and Weinhardt (2020), and Denning, Murphy, and Weinhardt (2023). This framework captures social comparison mechanisms, whereby students' motivation,

confidence, and aspirations depend on whether they are high- or low-ranked relative to their peers. Importantly, the project studies exposure to high- and low-rank peers alongside individual rank. By combining rank measures with leave-one-out peer composition variables, we distinguish between effects driven by relative position (being high- or low-ranked oneself) and effects driven by the surrounding rank distribution (being exposed to many top- or bottom-ranked peers). This distinction allows us to test whether peer effects operate primarily through spillovers from peers' ability or through social comparison and reference-group mechanisms.

We plan to exploit also the fact that alternative definitions of "relevant peers" could be adopted, and this would allow a meta-analysis of the empirical results obtained using the same empirical approach with alternative definitions of peers. This could be informative about the mechanisms driving peer effects.

We plan to explore the possibility to adapt the setting proposed by Isphording and Zoelitz (2022) to our context to assess peer value added at different stages of educational careers.

Overall, the paper provides a comprehensive and institutionally grounded analysis of peer effects across the Italian educational system. By combining longitudinal test data, administrative records, and post-graduation outcomes, the paper clarifies the mechanisms through which peers influence educational performance and choices. The results contribute to the broader literature on peer effects in education and inform policy debates on classroom composition, tracking, and student assignment.

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Abstract 9

Extended abstract on *Gender Bias in Teachers' Grading and Educational and Labor Market Outcomes*

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There is a consensus that the quality of teaching and the school environment are primary factors affecting students' academic performance and the size of the gender gap in schools (Hanushek and Rivkin, 2006). Among the possible determinants of these gender gaps in education, extensive literature examines the role of gender-biased teacher evaluations. Grades are not only measures of academic achievement, but also informational signals that convey information about ability, effort and potential. These signals influence students' self-perceptions, expectations and subsequent choices, thereby affecting educational transitions and long-run outcomes. A growing body of research shows that teachers' grading practices are not gender neutral and that boys and girls may receive systematically different evaluations even when they display similar levels of academic performance (Lavy, 2008; Lavy and Sand, 2018; Terrier, 2020) including in the Italian context (Di Liberto et al., 2022). If such differences reflect gender bias, their consequences may extend well beyond the classroom, shaping educational decisions and potentially contributing to persistent gender disparities in the labor market.

Understanding these mechanisms is particularly important given the persistent gender differences observed in educational attainment and labor market outcomes. International evidence documents that, despite girls' higher average educational attainment, women remain under-represented in scientific and technical fields, which are typically associated with higher economic returns (OECD, 2012; Eurydice, 2010). At the same time, boys are more likely to repeat grades, disengage from school and leave education early, and they lag behind girls in tertiary attainment in most advanced economies (OECD, 2015, 2020). These patterns suggest that gender differences in outcomes emerge from a sequence of educational experiences and decisions, rather than from a single transition, highlighting the possible contribution of early signals provided by schools.

A large body of research in economics, education and psychology documents how teachers' stereotypes, beliefs and expectations about gender roles may influence classroom interactions and assessment practices. Teachers may provide different feedback, encouragement or sanctions to boys and girls, reflecting implicit biases, thereby reinforcing gendered norms of behavior and performance (Rosenthal and Jacobson, 1987; Stobart, 1992; Ertl et al., 2017; Alan et al., 2018). Through self-fulfilling prophecy mechanisms, such differential treatment can affect students' motivation, self-confidence and engagement, with lasting effects on academic outcomes and educational choices (Lavy and Sand, 2018).

Empirical studies exploiting the presence of teacher-assigned grades and standardized test scores consistently find evidence of gender bias in grading, often in favor of girls (Lavy, 2008; Breda and Ly, 2015; Terrier, 2020). The standard approach in this literature measures bias as the difference between non-blind teacher assessments and externally administered, blind or quasi-blind standardized tests, under the assumption that the latter are less susceptible to teachers' discretion or stereotypes (Burgess et al., 2013). While this approach cannot disentangle discrimination from differences in the skills captured by alternative assessment tools, it offers a widely used summary measure of gender bias in grading. This strand of the literature is complemented by studies that rely

on alternative methodologies to investigate gender-biased assessment, including the use of Implicit Association Tests (IAT) to measure teachers' implicit stereotypes (Carlana, 2019; Alesina et al., 2024) and within-family designs based on sibling comparisons (Figlio, 2005).

Interpreting differences between teacher grades and standardized test scores requires careful consideration of the mechanisms through which bias may arise. Teachers' stereotypes and expectations represent one important channel, potentially interacting with the length and intensity of the student–teacher relationship, as statistical discrimination may be stronger when information about students' ability is limited (Terrier, 2020). Grading practices also differ in the extent to which they incorporate non-cognitive dimensions such as behavior, participation and motivation, which are documented to vary by gender (Stobart, 1992; Mechtenberg, 2009). Boys are more likely to display disruptive behavior and lower self-regulation, characteristics that teachers may sanction through lower grades, thereby widening the gap between blind and non-blind assessments (Duckworth and Seligman, 2006; Matthews et al., 2009). Differences in assessment formats further complicate the picture. Standardized tests and teacher evaluations capture overlapping but not identical skills, and gender differences in performance may also vary depending on the level of pressure, competition and interaction involved in the assessment process (Gneezy et al., 2003; Burgess et al., 2013). Moreover, gender stereotypes may be subject-specific and may operate differently in mathematics, science or language studies, generating heterogeneous patterns of bias across domains (Breda and Ly, 2015; Proitz, 2013).

More recent contributions move beyond documenting the presence of bias and begin to explore its consequences. Existing evidence shows that exposure to biased grading affects students' academic progress several years later and influences the formation of beliefs about relative ability (Lavy and Sand, 2018; Lavy, 2019; Terrier, 2020).

The development of an integrated database within the project *"The Roots of Success: The Role of Schooling, Higher Education and Institutions in Shaping Future Labor Market Outcomes"* will enable the analysis of educational, academic, and early labor market trajectories of Italian students enrolled at five universities starting from the academic year 2012/2013. By linking information on grading practices during compulsory schooling (measured using INVALSI administrative data) to subsequent educational transitions, field-of-study choices, employment outcomes, and early career indicators, this project aims to follow individuals longitudinally from school into higher education and the labor market, thereby contributing to the literature on the long-term consequences of teachers' grading practices.

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Abstract 10

The Effect of the No-Tax Area on Earned University Credits: A Regression Discontinuity Approach

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Policies aimed at reducing the financial burden of higher education have become increasingly central in many countries, as governments seek to promote access, equity, and academic success among students from economically disadvantaged backgrounds. Tuition fee exemptions and grants are among the most widely adopted instruments, with the dual objective of lowering barriers to entry and fostering regular academic progression (Graziosi et al., 2021; Agasisti & Murtinu, 2016; Page et al., 2019).

This study aims to contribute to the literature investigating the relationship between financial aid policies and academic performance by evaluating the effect of the "no-tax area" policy on earned university credits during the early stages of students' academic careers. The "no tax area" is a policy introduced in 2017 by the Budget Law to make university education accessible to students from low-income families by granting full or partial exemption from university fees based on the Equivalent Economic Situation Indicator (ISEE). For first-year students, access to the no-tax area is granted automatically if a valid ISEE has been submitted within the established deadlines and limits. From the second year onward, monetary eligibility alone is insufficient; academic merit, measured by University Educational Credits (CFU), also becomes mandatory. These requirements originate from the framework established by the Ministry of University and Research (MUR) under Decree No.1014/2021. This policy rewards consistent academic progression while discouraging enrolment without genuine participation or examination commitment.

The analysis compares credits earned by students eligible for the benefit of full exemption - those with an ISEE below the given administrative threshold (e.g., €13,000 in 2017/18) - to those of non-eligible students. Because eligibility is determined by income, assignment is not random, creating a discontinuity at the threshold. The evaluation strategy relies on a regression discontinuity design, comparing students just below and just above the cutoff, who are otherwise similar. Differences in credits earned between these groups can thus be interpreted as the causal effect of the "no tax area" policy. This approach has been widely used in education economics to evaluate the impact of scholarships, grants, and admission rules, and is regarded as one of the most robust quasi-experimental methods available (Mealli & Rampichini, 2012, Castleman & Long, 2016). Understanding whether and to what extent tuition exemptions affect academic performance is crucial for assessing the effectiveness of financial aid policies not only in promoting access, but also in encouraging meaningful engagement with university studies.

Furthermore, the analysis explores heterogeneity in the policy's effect across departments to identify potential variations in treatment impact among different academic contexts within the same university. Indeed, students are nested within departments that may differ substantially in terms of

curriculum structure, exam organization, and overall difficulty. The aim is to explore if these contextual differences can influence both baseline academic outcomes and the way students respond to financial incentives. To address this issue, the study exploits a multilevel RD approach. This combined approach makes it possible to estimate the causal effect of the "no-tax area" policy while explicitly accounting for the clustered nature of the data and potential variation across higher-level units (i.e. the departments). From a substantive perspective, this variation is relevant for policy evaluation, as it sheds light on whether the effectiveness of tuition waivers is context-specific or broadly homogeneous.

The type of dataset required for the analysis is common in higher education administrative data systems. Essential elements include: an individual-level outcome measuring academic progress; a continuous income-based variable driving eligibility for tuition exemptions; a defined cutoff rule; and identifiers (e.g., the degree course) that allow students to be linked to higher-level academic units (e.g., department). Covariates at individual and group levels can also be added.

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Abstract 11

Understanding Educational Poverty: Insights into youth opportunities

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In recent years, educational poverty (EP) has gained institutional and political attention due to its significant impact on individual development and well-being (Glaesser, 2022). Unlike other forms of poverty, EP does not only affect present living conditions but shapes future trajectories by limiting access to knowledge, skills, and resources that are essential for personal development and social inclusion. For children and adolescents, EP is particularly critical, as it interferes with key developmental processes and contributes to the intergenerational transmission of disadvantage (Heckman et al., 2013).

Despite its relevance, measuring EP remains an open challenge. Over the past 30 years, the scientific literature has evolved along a path that, starting from an initial identification of EP in terms of educational attainment or cognitive skills, and, thanks to the contribution of Sen's capability approach (Sen and Anand, 1997), has finally recognized the multidimensional nature of the concept. Specifically, drawing on Sen's capability approach, EP can be conceptualized as the lack or inadequacy of educational opportunities within a person's living environment, which hinders the development of cognitive, cultural, and social capabilities. These disparities in learning conditions disproportionately affect young people from disadvantaged socio-economic backgrounds and pose particular risks for adolescents, who are at a pivotal stage of personal and educational growth. In this regard, the NGO Save the Children took a significant step towards a more comprehensive definition of EP with the publication of the report La lampada di Aladino (Save the Children, 2014), in which EP is described as “the deprivation of children and adolescents from the opportunity to learn, experience, develop, and freely cultivate their capabilities, talents, and aspirations” (p. 4). This lack of opportunities has an impact on cognitive and problem-solving skills (learning to understand), psychological and emotional development (learning to be), ability to promote social and inter-personal relationships (learning to live together), health, physical integrity, and food security (learning to lead an autonomous and active life) (Save the Children, 2015).

Based on these premises, the present contribution proposes a conceptual model that operationalizes EP as a latent, multidimensional construct characterized by limited access to educational opportunities (EO) in family, school, and environmental contexts (Davino et al., 2025). These dimensions reflect the main contexts in which children and adolescents interact, learn, and develop, and are widely recognized in the literature as crucial determinants of educational inequality. The *Family* dimension encompasses the resources and supports available within the household, including access to educational materials, cultural experiences, time and space for study. The *School* dimension refers to the opportunities provided by educational institutions, such as access to learning tools, extracurricular activities, enrichment programs, and supportive learning environments. The *Environment* dimension captures the broader socio-territorial context, including the availability of cultural, recreational, and educational infrastructures that extend learning beyond formal schooling.

In addition to conceptualizing EP in terms of opportunities, the proposed model explicitly incorporates individual-level outcomes associated with EP. Drawing on existing literature, it posits that limited access to EO affects not only cognitive outcomes, such as school performance, but also

non-cognitive dimensions, including lifestyle and socio-emotional development. Furthermore, a central outcome of EP identified in the model is the capacity to aspire (Appadurai, 2004), understood as the culturally shaped ability to imagine future possibilities and to navigate pathways toward desired goals.

A set of individual-level indicators are employed to measure all the constructs included in the theoretical model. These indicators are derived from established sources, including the Save the Children framework and official surveys, and are complemented by ad hoc items developed to address gaps in existing measures. Our approach aligns with the ISTAT 2024 scientific commission's distinction between opportunities and outcomes but measures EO at the individual level, focusing on ages 15-19, while ISTAT focuses on territorial aggregates and draws exclusively on official statistical sources for constructing indicators.

The work has clear implications for research and policy. From a research perspective, it opens new avenues for studying EP beyond traditional outcome-based measures, allowing researchers to investigate the mechanisms through which opportunity structures influence educational trajectories. From a policy perspective, it offers a diagnostic framework that can inform targeted interventions by identifying which dimensions of opportunity are most lacking and for which groups.

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Abstract 12

Understanding Student Mobility in the Bachelor-Master Transition

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Geographic mobility among university students during the transition from bachelor's to master's programs represents a phenomenon of growing relevance for higher education systems and for society as a whole. Student mobility is often interpreted as a signal of institutional attractiveness or academic prestige; however, it's important to consider that mobility is deeply intertwined also with demographic dynamics, regional development, social inequalities, and individual life chances.

In many national contexts, internal student mobility contributes to selective population movements that often exacerbate regional imbalances. This phenomenon is strongly correlated with a persistent "brain drain" from disadvantaged areas (e.g., Southern regions in Italy) toward more developed, attractive territories (Columbu et al., 2021; Enea, 2018). Such unidirectional flows inevitably impact national economic development, affecting innovation potential and the distribution of government resources allocated based on university attractiveness (Viesti, 2005; Fratesi and Riggi, 2007). The resulting social impact is also significant: the mechanisms driving geographic mobility can consolidate existing disparities and inequalities, influencing student aspirations and potentially reinforcing gender stereotypes (Usala et al., 2023).

The aim of this study is to contribute to the literature on the factors influencing students' geographic mobility decisions when moving from bachelor's to master's programs, with a particular focus on identifying prevailing patterns, temporal trends, students' socio-demographic characteristics and academic performance. The work conceptualizes the mobility as the result of multiple interacting forces operating at the individual, institutional, and territorial levels. This perspective allows for a comprehensive examination of both voluntary and constrained forms of mobility, as well as of the different motivations underlying students' choices.

The conceptual framework underpinning the study draws on three main theoretical approaches widely used in the literature to explain student mobility (Usala et al., 2023). The Human Capital Theory interprets mobility as an investment decision, whereby students relocate to maximize expected returns in terms of future employment opportunities, earnings, and career prospects. From this viewpoint, differences in labor market conditions, employability outcomes, and institutional performance play a central role in shaping mobility flows. The Signaling Theory emphasizes the role of institutional reputation in mobility decisions. In contexts characterized by strong competition for qualified jobs, degrees obtained from highly reputed universities may serve as signals of ability and quality to employers. Consequently, students may be incentivized to move toward institutions with stronger reputational capital, as reflected in national and international rankings, selectivity, and perceived academic quality. Finally, the Preference Theory highlights the importance of individual preferences and lifestyle offered by the context. According to this perspective, mobility choices are influenced not only by academic or labor market considerations but also by factors such as quality of life, urban environment, and access to services.

Rather than treating these theories as mutually exclusive, the study adopts an integrated approach, recognizing that student mobility decisions are typically driven by a combination of investment motives, signaling considerations, and contextual preferences. This integration is reflected in the empirical strategy, which operationalizes each theoretical perspective through a set of indicators capturing distinct but complementary dimensions of the mobility process. These indicators capture universities' capacity to attract and retain students, the balance between incoming and outgoing flows, the heterogeneity of student populations, and the extent to which mobility is driven by structural constraints, such as limited program availability or admission restrictions. Additional indicators measure the role of labour market outcomes, institutional reputation, and quality-of-life factors in shaping students' decisions. Moreover, while indicator construction provides an overview of prevailing mobility patterns and their evolution over time, regression-based models are used to examine the relationship between students' socio-demographic and academic characteristics and their propensity to move, while accounting for institutional and contextual factors.

To address the research aims, the study relies on a rich combination of administrative microdata and publicly available external datasets. Administrative data provided by universities offer detailed information on students' academic careers, including socio-demographic characteristics, enrolment histories, academic performance, and transitions between institutions. To complement individual-level information, external databases are used to capture institutional characteristics and territorial contexts. These sources provide indicators on university reputation, ranking positions, degree program availability, and features of the surrounding territory, such as labour market conditions and quality-of-life measures.

The study offers practical tools for policymakers and higher education institutions, enabling them to monitor mobility dynamics, identify structural imbalances, and design targeted interventions aimed at promoting equity, efficiency, and territorial cohesion within higher education systems.

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Abstract 13

Mapping Academic Performance through School History

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Understanding what shapes students' academic performance—measured jointly by the speed of progression and the quality of outcomes—is essential for the design of effective and equitable higher education policies. Post-secondary education enhances economic competitiveness by building advanced human capital, facilitating knowledge diffusion, and sustaining long-run productivity growth. In this context, identifying the factors that influence university performance, persistence, and completion is crucial to improve both student outcomes and the efficiency of public investment in education.

A growing literature has recently begun to investigate the determinants of university performance, with particular attention to the Italian higher education system and the complexity of students' academic paths over time (i.e. Meggiolaro et al 2017). However, despite these advances, relatively little is known about how early educational trajectories—from primary and secondary schooling to university entry—shape academic outcomes during tertiary education. This project aims to fill this gap by mapping students' academic performance through their entire school history, adopting a longitudinal and multidimensional perspective.

The analysis conceptualizes university performance along two interrelated dimensions: timing, captured by progression speed and time to degree, and quality, measured through grades and academic achievement. Studying these dimensions jointly allows for a more comprehensive understanding of students' behavior and constraints, including time and effort management, which are key skills potentially affecting both performance and persistence. Identifying the determinants of these outcomes simultaneously contributes both to a deeper understanding of the functioning of the Italian university system and to improved resource allocation within higher education.

Methodologically, the project relies on rich administrative data of university students from a medium-size university in Italy, linked to individual-level educational histories across different stages of education. A first fundamental and innovative step of the project is the combination of multiple data sources, which makes it possible to construct rich individual-level longitudinal datasets. These longitudinal data enable the reconstruction of complete school-to-university trajectories and the identification of critical transition points and path dependencies. The empirical strategy combines event-history models and causal inference approaches with sequence analysis, a categorical longitudinal method that captures the full structure of educational trajectories (Wald 2004). Sequence analysis allows academic paths to be represented as ordered sequences of states and enables the identification of recurring patterns or clusters of trajectories that are internally similar and externally distinct. The richness of the data enables the analysis of heterogeneous patterns across and within fields of education, and the assessment of how prior school histories differentially shape academic performance in humanities, technical, scientific, and health-related disciplines.

The project makes three main contributions. First, it provides a comprehensive mapping of university academic performance explicitly linked to prior school history. Second, it sheds light on the mechanisms through which educational inequalities may persist or be amplified during tertiary

education, even among relatively selected populations. Third, it delivers policy-relevant evidence on how institutional and individual factors shape performance and progression, informing debates on access, evaluation, and the efficient allocation of resources in higher education systems.

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Abstract 14

Family Legacy and Field of Study /Career Choices by Gender

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Family background shapes educational and occupational trajectories, but "family legacy" might be not gender-neutral: the same parental resources that ease access to high-return fields and careers—occupation-specific know-how, information, reputational capital, networks, and firm-level connections—may be transmitted differently to daughters and sons, and may interact with gendered norms, expectations, and constraints.

This project aims to study how family legacy operates along two lines, i.e. university field-of-study choice and career/occupation choice—and how the strength and mechanisms of transmission differ by gender. We employ a rich dataset that links detailed university career information for graduates from a medium-sized Italian university with their early labor market outcomes obtained from Almalaurea surveys. We can therefore link parents' education and occupation with children's university degree type/field and subsequent occupation, allowing us to separate educational inheritance (field-of-study sorting) from labor-market inheritance (occupational and employer connections), and to quantify how much of gendered occupational sorting is mediated by gendered educational pathways.

The first component focuses on field-of-study choice, where returns differ strongly across fields and selection is critical (Kirkebøen, Leuven, and Mogstad, 2016). Evidence shows that subjective expectations, non-pecuniary considerations, parental approval, and anticipated workplace attributes are central to major choice and help explain gender gaps (Zafar, 2013; Wiswall and Zafar, 2015, 2018). These insights suggest that legacy may be especially gendered in the education stage: parental background can influence not only perceived returns but also perceived compatibility with anticipated family roles, potentially steering daughters and sons into different fields. Moreover, exposure to female role models can shift women's major choices in high-return domains (Porter and Serra, 2020), implying that same-gender role models within families may powerfully shape women's field choices.

The second component examines labor-market inheritance and its gendered nature, distinguishing between positive network transmission and distortive channels. On the positive side, social contacts account for a large share of occupational persistence: choosing a parent's occupation speeds job finding (Lo Bello and Morchio, 2022), and employer-level connections raise early-career earnings (Corak and Piraino, 2011; Staiger, 2025). On the distortive side, family ties can shape entry in

regulated professions when monitoring is weak: reforms to Italy's bar exam reduced new entrants with family ties (Bamieh & Cintolesi, 2021), and Italian politicians extract private-sector jobs for family members (Gagliarducci & Manacorda, 2020). These mechanisms may generate gendered effects if family influence disproportionately sustains male careers or if women face different network barriers.

We will first document gender-specific intergenerational transition patterns: parents' occupation → child's field-of-study; parents' education/field → child's field-of-study; parents' occupation → child's occupation. This establishes where persistence is strongest (e.g., regulated professions, business/management tracks, STEM, health) and whether persistence is concentrated in same-gender dyads (father–son vs mother–daughter) consistent with gendered role-modeling and occupation-specific investments. Second, we will quantify mediation: how much of occupational persistence is explained by field-of-study inheritance, versus "direct" channels that remain after conditioning on degree type/field and academic achievement proxies and how it differs by gender. Third, we examine whether parental influence varies by parents' area of origin and occupation type, and child's academic performance. Recent evidence suggests that transmission mechanisms differ across the skill distribution and occupational categories (Chetty et al., 2014; Acciari, Polo & Violante, 2022). Family legacy may operate primarily through educational pathways for children from professional families (lawyers, doctors, academics), where credentialing is essential, but through direct labor-market channels for children from entrepreneurial families, where firm access and networks matter more. Similarly, high-achieving students may leverage family knowledge to optimize field choice, while lower-performing students may rely more on direct occupational access through family networks. Moreover, following Giavazzi et al (2014) and Guiso and Zaccaria (2023) we will leverage the region of origin of the parents to proxy the strengths of traditional gender roles and social norms and assess their potential mediating role in the transmission mechanism. Finally, we will investigate whether gender shapes each of these channels differently.

Our results will be of interest also for policy makers: if family legacy disproportionately benefits men in high-return careers (entrepreneurship, regulated professions, leadership), then interventions that expand mentoring, transparency, and access to networks for women could reduce gender gaps without requiring large changes in formal schooling. Conversely, if family legacy mainly operates via nepotism and restricted access, reforms to monitoring, evaluation, and hiring rules may improve both gender equity and allocative efficiency. Additionally, understanding the heterogeneity in the nature of parental influence is crucial for designing targeted policies: if family legacy operates differently across the ability distribution, interventions to promote equal opportunity may need to be tailored accordingly.

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Abstract 15

How Classroom and School Peers Shape Students' Future Choices and Success

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Peer effects in education have long been recognized as a crucial determinant of student outcomes, yet identifying causal peer influences remains challenging due to selection and reflection problems (Manski, 1993; Sacerdote, 2001). Recent advances in research design—exploiting random or quasi-random assignment of students to classrooms, schools, or cohorts—have provided credible estimates of how peers shape academic achievement, educational choices, and labor market outcomes (Carrell, Fullerton & West, 2009; Hoxby, 2000; Lavy, Silva & Weinhardt, 2012). This project examines how classroom and school peers affect students' academic performance and university outcomes, leveraging a unique dataset that links standardized test scores, final exam grades, and university administrative records across the Italian education system.

We address three central questions: (1) How do classroom and school peers in primary and secondary school affect academic performance, as measured by INVALSI standardized test scores and Ministry of Education exam grades? (2) Do peer influences extend to university outcomes, like academic performance and degree completion? (3) What mechanisms drive these effects—academic spillovers through classroom interactions, information transmission about educational opportunities, or shifts in aspirations and social norms?

These questions build on extensive evidence that peers matter for achievement (Sacerdote, 2011; Feld & Zölitz, 2017) and that peer effects can persist and compound over time, influencing college completion and early career outcomes (Carrell, Hoekstra & Kuka, 2018; Zimmerman, 2003).

We exploit a rich linked data set combining INVALSI standardized test scores, Ministry of Education records and university administrative records to construct measures of peer environments at each educational stage.

Our primary identification strategy exploits quasi-random variation in peer composition generated by classroom assignment rules within schools. In Italy, students are typically assigned to classrooms in first grade and remain in stable groups through fifth grade, with classroom reassignment occurring at lower secondary school entry (grade 6) and again at high school entry (grade 9). Following Hoxby (2000) and Lavy, Paserman & Schlosser (2012), we use within-school, across-cohort variation in peer characteristics—controlling for school fixed effects and cohort-specific trends—to isolate exogenous peer effects.

For university outcomes, we examine whether primary and secondary school peers' average achievement predict individual field selection. This approach is similar to recent work studying peer effects on major choice in college settings (De Giorgi, Pellizzari & Redaelli, 2010; Zölitz & Feld, 2021), but extends the analysis to examine whether peer influences formed years earlier continue to shape educational trajectories. We also investigate whether students who attended school with higher-achieving peers perform better in university, accumulate credits faster, and are more likely to graduate on time. We explore heterogeneity by student baseline ability (measured by early INVALSI scores), family background, and gender to assess whether peer effects exacerbate or mitigate educational inequalities (Booij, Leuven & Oosterbeek, 2017; Carrell, Sacerdote & West, 2013).

This project makes two contributions to the peer effects literature. First, by linking standardized test scores, high-stakes exam grades, and comprehensive university records, we provide rare evidence on how peer influences persist across educational transitions and whether early peer exposure has long-run consequences for university success. Existing work typically focuses on outcomes within a single institution or educational stage (Sacerdote, 2001; Carrell, Fullerton & West, 2009), while we trace effects from primary school through university completion—a span of over 15 years. This allows us to distinguish between short-run achievement effects that fade quickly and persistent influences that shape educational attainment and human capital accumulation.

Second, we contribute to understanding whether peer effects are primarily local (operating within classrooms) or extend to broader school-level networks. If school-level peer composition matters beyond classroom peers, this suggests that information transmission and social norm formation operate through wider networks—with implications for school assignment policies and debates about socioeconomic integration (Abdulkadiroğlu, Angrist & Pathak, 2014; Angrist et al., 2021). We investigate this by comparing estimates using classroom-level peer measures to those using school-cohort-level measures.

Our findings will speak directly to education policy debates about classroom composition and ability grouping. If strong peer effects concentrate disadvantage among low-achieving students, policies promoting socioeconomic and ability mixing—such as controlled classroom assignment—may improve both equity and aggregate outcomes (Duflo, Dupas & Kremer, 2011). Conversely, if ability-based grouping generates substantial gains for high-achievers without harming low-achievers, targeted grouping policies may be welfare-improving (Sacerdote, 2011). Understanding whether and how peer influences formed in primary and secondary school extend to university choices and success is particularly important for assessing the long-run consequences of classroom composition policies and the intergenerational transmission of educational inequality (Chetty et al., 2011).

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Abstract 16

A Hurdle Race: How Barrier Exams Shape University Careers

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The Italian university system, like those in many countries, uses course-by-course exams to determine academic progress. A distinct feature is the multiple exam sessions (*appelli*) held throughout the year, giving students several chances to take and pass their exams, unlike one-time tests common elsewhere. During the first year of enrollment especially, students navigate "barrier exams"—gateway courses embedded in prerequisite chains (*propedeuticità*) and progression rules that can shape later trajectories by affecting incentives and selection (Stinebrickner & Stinebrickner, 2014; Scott-Clayton, 2011). Although failure at a barrier is rarely final because additional attempts are available, it triggers a dynamic optimization problem: whether and when to reattempt, how to reallocate study time across courses, and whether to adjust course loads, attendance, or even program choice (Stinebrickner & Stinebrickner, 2012). In extreme cases, a particularly difficult gateway exam can produce large delays and contribute to early dropout (Bound, Lovenheim & Turner, 2010).

This project wants to shed light on how barrier exams and their retake structure affect university careers in Italy. We focus on three distinct sets of outcomes:

1. **Short-run progression**: dropout and credits earned in the following semester.
2. **Dynamic outcomes**: subsequent exam-taking intensity, cumulative credits, and average grade.
3. **Longer-run outcomes**: time-to-degree, graduation, and early labor-market entry.

We use administrative student records from a medium-sized Italian university containing exam attempts, dates and grades, course enrollment, credits (CFU) accrued, program information including switches, and dropout indicators. We are able to identify barrier exams and delays relative to expected progression.

By observing students' entire academic histories, we examine how early barrier outcomes shape subsequent course-taking and progression throughout the curriculum. An early failure can shift the entire exam schedule, increase time-to-degree or leading to dropout (Bailey, Jaggars & Jenkins, 2015). This allows us to quantify not only the immediate effects of not passing a single exam but also the dynamic, compounding effects of early curriculum delays.

We model outcomes over event time (e.g., semesters since first attempt) and estimate impacts on (i) delay, (ii) probability of eventual completion or dropout or program switching, (iii) cumulative academic performance, (iv) future labor market outcomes. We examine heterogeneity by prior preparation, socioeconomic background, and program field, since retake costs and opportunity costs may vary sharply across groups (Bailey & Cho, 2010; Denning, 2017).

By focusing on the distinctive Italian exam environment—multiple *appelli* and systematic opportunities to reattempt after failure (even within *appelli)*—this project will provide new evidence on how assessment rules shape higher-education trajectories in a setting where "failure" often manifests as delay rather than immediate exit. The results speak directly to policy choices universities routinely face: how strict prerequisites should be, how many exam sittings to offer, and whether retake structures reduce inequality by providing second chances or instead increase

time-to-degree through repeated delays and strategic behavior (Scott-Clayton, 2011; Leuven, Oosterbeek & van der Klaauw, 2010; Bratti, Granato & Havari, 2026).

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