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PRESENTATION

The Economics of Education Association¹ was founded in Barcelona on March 30th 1992, with the aim of grouping academics who, together with researchers, directed their efforts primarily to issues related to the Economics of Education. It is a non-profit organization, performed on a voluntary basis and it serves the following purposes:

- a) To promote and disseminate studies of Economics of Education, as well as provide training and retraining of experts.
- b) To encourage professional contacts and exchanges, sharing the work and research on the subject among the various individuals and institutions interested in it, both in Spain and abroad.
- c) To organize -alone or in collaboration with other organizations or entities- conferences or meetings and other scientific activities on economics of education.
- d) To publish literature related to the subject and maintain or promote the creation of specialized libraries.
- e) To promote the development of a homogeneous statistical database and ensure it is maintained and updated.
- f) Any other function related to the specific field of Economics of Education, with non-profit purposes.

Furthermore, it promotes the dissemination and transfer of knowledge to society and public managers in various fields of education in collaboration with the National Institute for Educational Evaluation (Ministry of Education and Vocational Training, Spanish Government) and the Institute of Fiscal Studies (Ministry of Finance, Spanish Government).

¹ <http://www.economicsofeducation.com>

Since 1992, the Education Economics Conferences have been held under the direction of the Association of Education Economics (AEDE). The XXXIII AEDE Conference 2025 was hosted by the Politecnico di Milano School of Management. This meeting fostered debate on topics such as the link between education and the labor market, the determinants of academic performance, the evaluation of educational policies, higher education, inequality within the educational system, human capital, as well as other more general aspects related to gender and well-being in the educational context.

This e-book contains the summaries of the presentations given during the XXXIII AEDE Conference.

PRESENTACIÓN

La Asociación de Economía de la Educación² fue fundada en Barcelona el 30 de marzo de 1992, con objeto de agrupar a profesionales e investigadores que centren su interés y dedicación en temas relacionados con el campo de la Economía de la Educación. Es una asociación sin ánimo de lucro, de carácter voluntario y sus fines son los siguientes:

- a) Promover y difundir los estudios de Economía de la Educación y formar y perfeccionar expertos en esta materia.
- b) Promover contactos e intercambios profesionales, confrontando los trabajos e investigaciones sobre el tema entre las diversas personas e instituciones interesadas en el mismo, tanto nacionales como de otros países.
- c) Organizar, por sí sola o en colaboración con otras organizaciones o entidades, congresos o reuniones y otras actividades científicas de Economía de la Educación.
- d) Editar publicaciones relacionadas con la materia y mantener o promover la formación de bibliotecas especializadas sobre la misma.
- e) Promover la formación de una base de datos estadísticos homogénea y procurar su mantenimiento y actualización.
- f) Cualquier otra función relacionada con el campo específico de la Economía de la Educación, quedando excluido todo ánimo de lucro.

Además, promueve la difusión y la transferencia de conocimientos a la sociedad y a los gestores públicos en los más diversos ámbitos de la educación en colaboración con el Instituto Nacional de Evaluación Educativa (Ministerio de Educación y Formación Profesional) y el Instituto de Estudios Fiscales (Ministerio de Hacienda).

² <http://www.economicsofeducation.com>

Desde 1992, las Jornadas de Economía de la Educación han venido celebrándose bajo la dirección de la Asociación de Economía de la Educación (AEDE). Las XXXIII Jornadas de la AEDE 2025 fueron acogidas por el Politecnico di Milano School of Management. En este encuentro se promovió el debate sobre temas tales como el vínculo entre educación y mercado laboral, los determinantes del rendimiento académico, la evaluación de políticas educativas, la educación superior, la desigualdad dentro del sistema educativo, el capital humano, así como otros aspectos más generales relacionados con el género y el bienestar en el contexto educativo.

Este libro electrónico contiene los resúmenes de las ponencias presentadas durante la celebración de las XXXIII Jornadas de la AEDE.

INTRODUCTION

The XXXIII Conference of the Association of Education Economics was held at the Politecnico di Milano School of Management on June 25-27, 2025. This proceedings' book contains summaries of all the papers presented at the conference.

A total of 106 papers, both theoretical and applied, were presented at the XXXIII AEDE Conference, distributed across 25 parallel sessions. These sessions covered the following topics: Determinants of Educational Performance; Teaching in Education; Non-Cognitive Skills; Education and Gender; Education and the Labor Market; Over-Education; Education and Well-Being; School Choice; Educational Policy; Equality and Education; Education and Immigration; Educational Production Function; Returns to Education; Vocational Education; Efficiency in Education; Human Capital and Economic Development; Education and the Labor Market; Educational Management and Planning; Intergenerational Educational Mobility; and, finally, Financial Education.

On the first day of the conference, a course on "The Uses of Process Data in Large Scale Assessments in Education" was given by Professor José J. García Clavel of the University of Murcia. On the 26th, the guest speakers were Roberto Ricci, President of the INVALSI Institute in Italy, and Carmen Tovar, Director of the National Institute for Educational Evaluation (INEE) in Spain, who discussed on the role and future challenges of educational evaluation agencies. Dr. Miguel Urquiola (Columbia University) gave the presentation on the 27th, on the topic: "Malleable Minds: The Effects of STEM- vs. Humanities-Focused Curricula."

I would also like to extend my personal gratitude, as well as that of the entire AEDE board, to all the individuals and entities that made the success of the XXXII Conference of the Association of Education Economics possible. Special thanks go to the Politecnico di Milano School of Management; to the Institute of Fiscal Studies for their long-standing commitment to these conferences; and to the National Institute for Educational Evaluation, for their support and interest in the Association's activities.

Finally, these conferences would not be possible without the selfless collaboration of the Scientific Committee and their rigor and punctuality in evaluating the papers, and, of course, the Organizing Committee. The latter are the heart of the conference and the ultimate reason for its success.

Thank you all very much!

Mauro Mediavilla Bordalejo

President of AEDE

INTRODUCCIÓN

Las XXXIII Jornadas de la Asociación de Economía de la Educación se desarrollaron en el Politecnico di Milano School of Management durante los días 25 a 27 de junio de 2025. El presente libro de actas recoge los resúmenes de todos los trabajos presentados en ellas.

En las XXXIII Jornadas de la AEDE se presentaron un total de 106 comunicaciones, de naturaleza tanto teórica como aplicada, distribuidas entre 25 sesiones paralelas. Éstas versaron sobre los siguientes temas: Determinantes del rendimiento educativo; Docencia en educación; Habilidades no cognitivas; Educación y género; Educación y mercado de trabajo; Sobre-educación; Educación y bienestar; Elección escolar; Política educativa; Igualdad y educación; Educación e inmigración; Función de producción educativa; Retornos de la educación; Educación vocacional; Eficiencia en la educación; Capital humano y desarrollo económico; Educación y mercado de trabajo; Gestión y planificación educativa; Movilidad intergeneracional educativa; y, por último, Educación Financiera.

El primer día de las Jornadas se impartió el curso “On The Uses of Process Data in Large Scale Assessments in Education”, por parte del profesor José J. García Clavel, de la Universidad de Murcia. El día 26, los conferencistas invitados fueron Roberto Ricci, Presidente del Instituto INVALSI de Italy y Carmen Tovar, Directora del Instituto Nacional de Evaluación Educativa (INEE) de España, quienes disertaron sobre el rol y los retos de cara al futuro de las agencias de evaluación educativa. El doctor Miguel Urquiola (Columbia University), por su parte, se encargó de la ponencia del día 27 con el tema: “Malleable minds: The effects of STEM- vs. humanities-focused curricula”.

Aprovecho la oportunidad para hacer llegar mi agradecimiento personal y el de toda la junta de la AEDE al conjunto de personas y entidades que han hecho posible el éxito de las XXXII Jornadas de la Asociación de Economía de la Educación. Al Politecnico di Milano School of Management; al Instituto de Estudios Fiscales por su apuesta por estas Jornadas

desde hace ya tantas ediciones y al Instituto Nacional de Evaluación Educativa por su apoyo e interés en las actividades de la Asociación.

Por último, estas jornadas no serían posibles sin la colaboración desinteresada del Comité Científico y su rigurosidad y puntualidad en el trabajo de evaluación de las comunicaciones y; evidentemente del Comité Organizador. Éstos últimos son el alma de las jornadas y los responsables últimos del éxito obtenido.

¡A todos y todas muchas gracias!

Mauro Mediavilla Bordalejo
Presidente de AEDE

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CHAPTER 1

EDUCATION AND GENDER

CAPITULO 1

EDUCACIÓN Y GÉNERO



The toys that made us. The role of game in gender gaps

Daniel Bianchi (Universidad de La Laguna)

Álvaro Choi de Mendizábal (Universidad de Barcelona)

John Jerrim (UCL)

Early gender gaps condition future educational decisions and labor market and social outcomes. There is extensive evidence reporting the existence of significant gender gaps in reading competencies at age 15 -favouring girls-, while boys tend to outperform girls in mathematics at that same age. Mixed results have been found for the scientific competencies. It has been suggested this patterns may explain why men tend to make a clean sweep on STEM careers. This has led to a debate on which factors may be driving gender gaps in educational outcomes. While some authors point to the existence of differences in psychological traits by gender, others focus on external factors, such as socioeconomic characteristics, parental values and educational trajectories. Another factor which is sometimes claimed to be a relevant determinant of the gender gap in performance are socially determined gender roles. Evidence on this last point has been however rarely tested. In this paper we shed light on this issue. We do so by exploring the relationship between the use of leisure time in science-related activities at early ages and the emergence of gender gaps in performance and educational expectations at age 15. We do so by taking advantage of intra and across country variation for a set of countries participating in PISA in order to map the existence of patterns at the cross-national level.

Keywords: gender gap, inequality of opportunity, STEM, game

Crime escalation and the cost of learning. Evidence from India

Deepthi Sara Anil (IIT Kanpur)

Mahamitra Das (IIT Kanpur)

Debayan Pakrashi (Indian Statistical Institute Kolkata)

Myra Yazbeck (University of Ottawa)

In this study we produce evidence that crime escalation, in other words the rising severity of crime leads to inefficiencies in human capital investments. We employ the spatial and temporal variation in the intensity of violent crime in Indian districts and find a deterioration in arithmetic and reading ability of children. To be specific; sudden surges in violent crime against body (VCB)—exceeding two standard deviations above a district's historical mean—are treated as quasi-exogenous shocks, unexpected due to their rarity and media coverage. A fixed-effects model with district, state-by-year effects, and district-specific trends controls for unobservables, while night-time luminosity, weather, child-level controls, and age fixed effects account for additional confounders. We ensure the validity of our results through lead-lag analyses, placebo tests, and pre-trend examinations, which confirm that VCB shocks predict educational outcomes specifically and are essentially random. Further checks on selective migration, coping mechanisms, and clustering strategies, along with consistent findings across specifications and dynamic panel methods, bolster confidence in the identification strategy. We find heterogeneous impacts by gender, age, household economic status and school type suggestive of an overall income shock due to violent crime exposure. We substantiate this by providing evidence of a withdrawal of female wage-earning activity due to higher levels of violent crime. The effects on the tests scores are persistent and indicate a change in fundamental human capital investment decisions by recording consistent dropout rates amongst older boys. We also find evidence of biased parental investment in the educational quality of girls.

Keywords: Crime, India, Human capital, Employment, Gender

Gender Composition and University Climate

Silvia Griselda (Bocconi University)

Paola Profeta (Bocconi University ,AXA Gender Lab)

Giulia Savio (University of Turin)

The university climate is an essential factor for students' outcomes and future trajectories. Traditional masculinity traits can create barriers to success especially for women in male-dominated fields. This paper leverages the random allocation of students into classes within the same course at an 'elite university to examine how the gender composition of peers affects students' gender attitudes, beliefs, anxiety, academic performance, and confidence. Our findings reveal that greater exposure to female peers reduces classroom conformity to masculinity norms and anxiety while improving confidence and exam performance.

Keywords: Gender diversity, Peer Effects, Masculinity, anxiety, social norms

It starts early! Male-dominated classes and girl's bullying.

Scott Cunningham (Baylor University)

Maria Laura Di Tommaso (University of Torino)

Antonio Melo (University of Turin)

Silvia Mendolia (University of Torino)

Giulia Savio (University of Turin)

Violence begins early in life, and the school environment is not exempt from aggressive behaviors such as bullying. In this paper, we rely on Invalsi data to document gender differences in the self-reported likelihood of being both victims and perpetrators across various dimensions of bullying, for students in primary school. Our findings show that this phenomenon is more prevalent among male students on both sides. Additionally, we analyze the impact of gender-imbalanced classes on bullying among girls and boys. By exploiting the quasi-random allocation of students within schools and across classes, we demonstrate that girls report significantly more bullying, both as victims and perpetrators, when the proportion of male peers in the classroom increases. These results are particularly driven by psychological dimensions of bullying, including mockery, isolation, and insults, and correlate with worse well-being measures and deterioration of friendships. In summary, this evidence illustrates how violence can transmit across same-sex groups, spilling over from boys to girls as the number of boys (initially more violent) increases. These patterns are crucial for understanding the initial social interactions among young peers. Furthermore, the gender implications of these findings are highly relevant to the policy discussion on violence against women.

Keywords: Gender diversity, Bullying, social violence, well-being, Primary Education

The role of teacher-student relationships in Mathematics performance in Ceará (Brazil): A longitudinal analysis using administrative data

Alessandra Benevides

Mauro Mediavilla (Universitat de Valencia & EVALPUB)

Zilania Mariano (Federal University of Ceara)

Luis Pires (Universidad Rey Juan Carlos)

Gisela Carolina Rusteholz (Universidad de Valencia)

Isabela Braga Sales (Universidade Federal do Ceará)

The existence of a performance gap between boys and girls in the area of mathematics leads to girls' lack of motivation in choosing careers focused on the areas of Science, Technology, Engineering, and Mathematics (STEM). These careers have higher salaries in the job market and this underrepresentation leads to the perpetuation of pay gaps between men and women. Although international literature is not yet consolidated and Brazilian literature is still developing, some studies show that, when girls have a female example to follow (role models), they feel more motivated and increase the likelihood of choosing a STEM career and performing better in mathematics. This research seeks to contribute to the literature by verifying the association of female role models on the mathematics performance of ninth-year elementary school students in public schools in Ceará, Brazil. A longitudinal database that was found and made available by the State of Ceará's Secretariat of Basic Education (SEDUC) will be used to achieve this. This database allowed for the assembly of a cohort of fifth-year students in 2013 and their follow-up until the ninth year of elementary school in 2017, which is thought to be a sensitive time for the beginning of the gender gap in mathematics performance. To analyze the determinants of mathematical performance, the multilevel hierarchical linear model (MLH) will be applied, considering three levels: students, classes, and schools. The main result shows that girls who have at least 75% of their math teachers who are female in elementary school score 1.73 higher on the math test than other girls who have a lower percentage of math teachers who are female.

Keywords: math performance, Female role models, multilevel hierarchical linear model, human capital

How Mathematics Gender Inequality During High School Affects the Labor Market: Evidence from Brazil

Zilania Mariano (Federal University of Ceara)

Alessandra Benevides

Arthut Monteiro (SEDUC)

This study investigates the relationship between gender inequalities in mathematics during high school and wage and occupational disparities in the labor market, an aspect still underexplored in the literature. To this end, a longitudinal analysis was conducted on students who graduated from public schools in Ceará, Brazil, between 2012 and 2014, examining their entry into the labor market in 2019. Using data from SPAECE, the School Census, and RAIS, we used the Oaxaca-Blinder Decomposition and Entropy Balancing methods to assess the influence of mathematical skills on income disparities, formal labor market involvement, and STEM employment. The results indicate that equalizing mathematical skills between girls and boys significantly reduces wage and occupational disparities between these groups. Furthermore, mathematical proficiency positively influences the likelihood of labor market participation and contributes to narrowing the gender gap among young individuals.

Keywords: Labor Market Disparities, Gender Inequality, Mathematical Proficiency

Closing the Gender Divide in STEM: The impact of female college professors on female student performance.

Francesco D'Angelo (Sapienza University of Rome)

Giuseppe De Arcangelis (Sapienza University of Rome)

Joanna Kopinska (Sapienza University of Rome)

This study examines how female teacher-student interactions impact the academic performance of young women. We analyze administrative data from STEM Bachelor's programs at Sapienza University of Rome, the largest university in Europe, focusing on student-professor matched records between 2017 and 2022. We exploit a quasi-experimental setting, referred to as channeling, in which first-year students are assigned to professors of different genders according to the first letter of their surname, thus mitigating selection bias. We find that assignment to a female professor significantly helps improve the gap in final exam grade between female and male students. The effects range between 6 and 9 percent of the exam grades standard deviation, depending on the model specification. In addition, assignment to a female professor seems to increase the probability of passing the exam on the first attempt for both male and female students. These results might suggest the presence of a "Battle of the Sexes" in STEM, where female students perform worse than their male counterparts when assigned to male professors, while the opposite often verifies when assigned to female professors, and this could be linked to the presence of strong gender stereotypes in those academic fields. We attempt a follow-up of students exposed to the quasi-experiment over their career. The results indicate that assignment to a female professors in the first year also helps to improve the gap in obtained credits and dropout rates in the first and following years. From a policy perspective, shifting female instructors towards first-year classes could benefit young women's careers in STEM through role model effects, while also helping to reduce gender stereotypes for their male peers.

Keywords: gender achievement gaps, education policy, quasi-experimental setup, STEM

Gender differences in application to elite schools: Evidence from Hungary

Éva Holb (HUN-REN CERS, Corvinus University of Budapest)

Daniel Horn (KRTK KTI)

This study investigates whether there are gender disparities in applications to elite schools in Hungary, specifically examining the role of competitive preferences in school choice. Given that Hungarian elite secondary schools vary in their admission criteria—ranging from GPA-only to programs requiring both written and oral entrance exams—we explore how these competitive elements impact application patterns among female and male students. Our main hypothesis is that female students are less likely than male students to apply to programs with stricter, more competitive admission requirements. Hungary's secondary school system is centralized, and thus all applications to elite schools are recorded in the Secondary School Admission Information System (KIFIR), covering applications from 2012 to 2022. Using this comprehensive dataset, we define relevant school markets and analyse students' choices within these contexts. We employ a linear probability model with fixed effects for years and primary schools to estimate gender differences in application likelihood across admission criteria. Preliminary results suggest that female students are somewhat more likely to apply to elite schools than male students overall. However, this advantage diminishes in programs requiring competitive admissions processes, particularly those involving oral exams, where female application rates drop compared to their male counterparts. This pattern holds even after accounting for factors such as field of study and oversubscription rates. These findings highlight how competitive admissions criteria can create gendered barriers in access to prestigious educational tracks, potentially reinforcing educational inequalities and occupational segregation.

Keywords: gender differences in education, elite schools, inequality, school choice, loss aversion

Is choice always good? Evidence from a French High School Reform

Alice Danon (Harvard University)

Julien Grenet (Paris School of Economics)

This paper examines the impact of increased subject choice on gender disparities in STEM enrollment, leveraging a natural experiment from a major reform of the French high school system. In 2018, the reform eliminated the high school track system, significantly increasing students' flexibility in subject selection. Using an event-study design, we find that the reform led to a decline in both male- and female-dominated STEM fields, with a highly gendered response. Women disproportionately moved away from male-dominated STEM fields, widening the gender gap in Mathematics enrollment by 7.2 percentage points (61%), while men shifted away from female-dominated STEM fields, reversing the gender gap in Biology. At the higher education level, we find that overall enrollment in STEM, Social Sciences, and Humanities remained stable. However, the reform influenced subject specialization within Social Sciences, particularly among women, who shifted away from Economics toward Law and Psychology. Additionally, the reform exacerbated the gender gap in preparedness for STEM-adjacent fields, such as Economics. While the reform had a substantial effect on subject choice in high school, its impact on higher education enrollment was more limited. These findings suggest that gendered preferences are largely established by the end of middle school, and exposure to different subjects in high school has limited influence on shaping students' long-term academic choices. This paper is co-authored with Julien Grenet (PSE). I could not add him as an autor.

Keywords: inequality of opportunity, Education policy, STEM, Gender

Public Early Childcare Provision and Long-Term Academic Outcomes

Marianna Battaglia (Universidad de Alicante)

María Cabrera

In the early stages of a child's development, a stimulating home environment is crucial for nurturing both cognitive and non-cognitive skills. However, not all families have access to such resources. Educational programs can serve as a means to bridge this gap. This study investigates the long-term effects of public early childcare on children's cognitive outcomes. We use an instrumental variable design by exploiting two sources of variation, the discontinuity in school starting age and the staggered implementation across municipalities of a policy that expanded nursery enrollment for children aged 0-2. We evaluate the impact of attending nursery by the age of 2 on standardized Math scores at the end of primary school. Our findings reveal a modest yet significant positive impact, with an average increase of 0.05 SD in standardized Math test scores and a reduction in the probability of repeating a course by 1.5 percentage points. Boys and native children from municipalities with higher proportions of migrant households experience the greatest benefits. These results highlight the importance of high-quality early childcare in promoting educational equity and improving long-term academic outcomes, while also revealing heterogeneous effects that can be partly attributed to increased maternal participation in the labor market. I would like this submission to be considered for MJ San Segundo award.

Keywords: Child Care, long-term outcomes, Education policy, cognitive skills, Gender

Can High-Stakes Entrance Exams Explain Why Fewer Women Study STEM Fields?

Miroslava Federicova (Center for economic research and graduate education-economics institute, CAS)

Alena Bicakova (CERGE-EI)

Barbara Pertold-Gebicka (Charles University)

This paper examines whether high-stakes entrance exams for STEM (Science, Technology, Engineering, and Mathematics) college programs contribute to the persistent gender imbalance in these fields. While girls perform similarly to boys in mathematics during high school, their representation in STEM programs remains significantly lower. The study exploits institutional changes in admission policies at the Faculty of Mathematics and Physics at Charles University between 2006 and 2023 to analyze how the abolition and subsequent reintroduction of entrance exams affected applications, enrollments, and academic performance of women. Our findings suggest that competitive entrance exams disproportionately deter female applicants. Using difference-in-difference approaches, our preliminary results show that abolishing entrance exams led to an increase in female applications and enrollment. The effects align with previous literature indicating that women tend to be more risk-averse, less confident in their mathematical abilities, and more sensitive to competitive stress. These findings contribute to the broader discussion on structural barriers in STEM education and suggest that admission policies play a significant role in shaping gender composition. Given the potential long-term consequences for the STEM workforce, policies should carefully balance selection criteria with initiatives to support women's participation in competitive fields.

Keywords: College entrance exam, gender gap, STEM

Evaluación de la Brecha de Género en Matemáticas y Ciencias: Tendencias y Causas

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Carmen Casares Antón (Educational advisor of National Institute for Educational Assessment (INEE))

La brecha de género en matemáticas ha aumentado en España y en la OCDE en los dos últimos ciclos de TIMSS en 4º grado y en el último ciclo de PISA en 10º grado. El traslado temporal según crece cada generación de estudiantes proyecta para el próximo ciclo PISA (2027) un incremento en la brecha de género. Sin embargo, la competencia en ciencias, que es un ámbito afín (STEM), no sigue las mismas pautas. No se ve brecha o no es tan generalizada o significativa. Se analizan las tendencias de la brecha de género en matemáticas y ciencias en los últimos ciclos de TIMSS y PISA. Las razones por las que existen diferencias en las dos competencias en las tendencias de la brecha de género incluyen motivos sociales, culturales, económicos y educativos. Dentro del ámbito educativo, los cuestionarios de contexto de alumnado y profesorado de TIMSS 2023 ofrecen la oportunidad de estudiar qué diferencias se observan entre el aula de matemáticas y la de ciencias que puedan justificar, o no, esta situación. En el cuestionario de contexto de los estudiantes, existen preguntas comunes en las áreas de matemáticas y ciencias sobre la claridad de las explicaciones del profesorado en el aula, percibidas por el alumnado. Con ellas se construye un índice de claridad de las explicaciones del profesor/a en el aula, y los resultados se publican en el informe internacional TIMSS 2023. En este estudio, se evalúan cada una de las preguntas que se utilizan para la construcción del índice por separado, para valorar si se aprecian diferencias en las prácticas educativas entre las aulas de matemáticas y ciencias que puedan justificar la brecha de género observada.

Keywords: TIMSS, Gender gap, Science, PISA, Math

Evolving Gender Norms and Caste Dynamics: Impacts on Educational Outcomes in Nepal

Bimala Thami (South Asian University)

The study investigates the impact of evolving gender norms, the society's spoken and unspoken rules about how different individuals should act, look, think or even feel, on a child's educational choices and outcomes in Nepal. While such gender relations of power have dictated rigid roles for men, contemporary trends reflect greater participation of women in the workforce, greater involvement of men in the households, greater number of women graduating college, amendments in laws that favoured males, to name a few. However these shifts have not been uniform as the intersection of caste and gender presents additional barriers for marginalised communities perpetuating structural inequalities in education. For instance, the struggles of Dalit women who experience dual subjugation (internal oppression within their own communities and external exploitation by dominant caste) are different that of the High caste women who navigate only the patriarchal oppression. These overlapping layers of discrimination exacerbate disparities in educational attainment, economic opportunities, and social mobility for a Dalit woman. Therefore, the study uses Nepal Demographic Health Survey (1996-2022) data to understand how gender norms and caste shape educational trajectories. In doing so it addresses key questions: How have gender norms evolved? Do these shifts lead to cumulative advantages or compensatory disadvantages? What are the implications for educational access and achievement across different caste and gender groups? While previous research has documented the gender disparities in education, it has failed to account for their gradual transformation and long-term effects on education and social structures.

Keywords: educational outcomes, Gender norm beliefs, caste dynamics, dalit woman

Exploring the Influence of Maternal and Teacher Role Models on Gendered Differences in Mathematics

Alice Bertoletti (European Commission - Joint Research Centre)

This study explores the influence of maternal and teacher role models on gender disparities in mathematics performance among Italian students, using longitudinal INVALSI data (2012/13–2018/19). Results reveal persistent gender gaps, with boys consistently outperforming girls from early grades. Maternal employment significantly impacts girls' math scores, with a 0.03 standard deviation decline when mothers are not employed. Female teachers positively influence girls, improving scores by 0.5 standard deviations on average, with larger gains observed when transitioning from male to female teachers. These effects are not seen in boys. Dynamic panel models and instrumental variable techniques underscore the importance of role models in mitigating gender gaps. The findings highlight the value of female role models in reducing disparities and promoting gender equity in STEM fields through targeted interventions, such as prioritising female teachers and supporting maternal workforce participation.

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Keywords: gender gap, standardized scores, mathematics learning, Role models, Female role models

Examining the Fallout: Who is Hurt by Educational Gender Biases?

Eyo Herstad (Erasmus University Rotterdam)

Ragnar Alne

This paper shows how to credibly identify gender bias for equally skilled students. This estimator is simple to implement, and allows us to identify gender bias for students with different skill levels and parental backgrounds. Using detailed registry data, we show that gender bias depends both on the socioeconomic background of a student, as well as the students own skills. We then show that students exposed to a negative bias are less likely to attend university and more likely to work after high school. Students with negative exposure have higher incomes for the first few years after high-school, but they start to earn less than their non-exposed peers ten years after starting high school.

Keywords: Gender, Identification, Bias

Determinants of Occupational Mismatch by Gender in Spain: Regional Factors.

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Ruben Garrido-Yserte (Universidad de Alcalá)

Oscar Montes Pineda (Universidad de Alcalá)

Occupational mismatch especially affects the youngest, a group that is entering the labour market for the first time, but also a significant proportion of workers with medium qualifications, older cohorts, women, ethnic minorities, and those with some degree of disability. This situation leads to a loss of social efficiency by maintaining a proportion of workers in occupations for which a lower (higher) level of education or skills would suffice. Moreover, if this situation is prolonged over time, it will affect the worker satisfaction, health, and well-being, which in turn affects companies' productivity and the economy in general. Using educational arguments within the labour market theories, this paper will analyse the determinants of labour mismatch by gender in Spain, taking into account the influence of the geographical and institutional context (NUTS1 regions). For this purpose, using the Spanish sample of the Program for the International Assessment of Adult Competencies (PIAAC), we will estimate equations analysing the probability of being mismatched, using two-stage Heckman-type techniques. Preliminary results recognize the importance of regional factors in labour mismatch, although in a limited way.

Keywords: Overeducation, overskilling, PIAAC, NUTS1, Spain

CHAPTER 2

DETERMINANTS OF ACADEMIC PERFORMANCE

CAPITULO 2

DETERMINANTES DEL RENDIMIENTO ACADÉMICO



Desajuste educativo de los egresados universitarios en México. Un estudio longitudinal de los trabajadores subordinados y remunerados de la ENOE (2005-2022)

Angélica Beatriz Contreras Cueva (Universidad de Guadalajara)

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Noe Rene Luna Plascencia (Universidad de Guadalajara)

Pamela Macias Alvarez (Universidad de Guadalajara)

Con este estudio se analiza el desajuste educativo de los egresados universitarios en México, durante el periodo comprendido entre 2005 y 2022. Este fenómeno se refiere a la desconexión entre el nivel educativo de los trabajadores y las exigencias de sus ocupaciones, manifestándose en formas de sobreeducación y subeducación. El estudio se basa en los datos de la Encuesta Nacional de Ocupación y Empleo (ENOE) y utiliza el método estadístico de la moda para identificar los niveles educativos más comunes en cada ocupación, permitiendo medir el desajuste. También se emplea un modelo de regresión logística multinomial para predecir la probabilidad de que un trabajador esté sobreeducado o subeducado. Los resultados indican que, a pesar de los avances en el acceso a la educación, el desajuste educativo ha empeorado en los últimos años, reflejando una asignación ineficiente del capital humano en el mercado laboral. Este fenómeno afecta tanto a los hombres como a las mujeres, aunque con diferencias significativas: las mujeres han mostrado una mejor adaptación del capital humano a las demandas laborales, con menores tasas de sobreeducación y subeducación. Sin embargo, persiste una brecha de género en el nivel de sobreeducación, siendo más prevalente entre los hombres. El estudio destaca que las políticas públicas de cada administración no lograron resolver de manera efectiva este desajuste convirtiéndose en una problemática estructural que requiere estrategias coordinadas entre el gobierno, las instituciones educativas y el sector privado. Se sugiere fortalecer la vinculación entre educación y empleo, promover el empleo formal y remunerado, y diseñar políticas que consideren tanto la dimensión de género como las cambiantes demandas del mercado laboral, especialmente en un contexto de transformación tecnológica.

Keywords: Desajuste educativo, Políticas públicas, Egresados universitarios

Efectos de la competencia personal, social y aprender a aprender en el rendimiento lector del alumnado español a partir de PISA 2022

Edgar Perales

Mauro Mediavilla (Universitat de Valencia & EVALPUB)

En los últimos años, se ha promovido de manera constante el desarrollo de competencias en el ámbito educativo. En este contexto, el objetivo de la investigación es analizar los efectos que ejercen la competencia social, la competencia personal y la competencia de aprender a aprender en el rendimiento lector de los estudiantes españoles. Estas competencias constituyen el eje más transversal dentro del marco de las competencias clave. Paralelamente, se observa que el rendimiento lector del alumnado español ha experimentado un descenso sostenido durante la última década, según los resultados del estudio PISA. Este trabajo examina las competencias educativas en relación con el marco normativo del sistema educativo español, teniendo en cuenta las principales recomendaciones y orientaciones proporcionadas por diversos autores e instituciones internacionales. Para evaluar los efectos de las competencias mencionadas sobre el rendimiento lector, se llevaron a cabo tres estimaciones mediante ecuaciones estructurales, utilizando como fuente principal los datos del Informe PISA 2022. Estas estimaciones se realizaron por separado debido a que la competencia en cuestión abarca tres dimensiones interrelacionadas: social, personal y aprender a aprender. Los principales hallazgos de este análisis revelan que los estudiantes que presentan un desarrollo avanzado de las competencias social y aprender a aprender obtienen un mejor rendimiento lector. No obstante, se detectó que una baja competencia personal puede asociarse con un mejor rendimiento lector, lo cual pone de manifiesto un problema relacionado con el estrés académico, que podría repercutir negativamente en la salud mental de los estudiantes. Asimismo, se identificaron otros factores influyentes, como la presencia de libros en el hogar y la disminución del uso de dispositivos electrónicos, que contribuyen a una mejora en el rendimiento lector.

Keywords: competencias clave, competencia personal, competencia social, competencia aprender a aprender, rendimiento lector

Peer Effects under Class Rank: Evidence from Chinese Middle Schools

Yinhe Liang (Central University of Finance and Economics)

Shuang Yu (Southwestern University of Finance and Economics)

Yaojing Wang (Peking University)

This paper is the first to document peer effects based on class rank. We exploit random classroom assignments in Chinese middle schools to examine how an individual's academic performance is influenced by class rank proximate peers in a competitive environment. The results show that a one-standard deviation increase in the rank proximate peers' effort raises student test scores by 17.9% of a standard deviation. Additional findings indicate that being ranked similarly to hardworking peers leads students to set higher goals, place more pressure on themselves, have hardworking friends, and interact more with their parents and teachers.

Keywords: Peer Effects, Academic performance, Class Rank

The Hidden Price for Mobility: Public Transit Pollution and Academic Achievement

Diego Martin (Harvard University, Harvard Business School)

Dario A (Romero. New York University Abu Dhabi)

Dario Salcedo (Indiana University Bloomington, School of Public and Environmental Affairs)

Developing transportation infrastructure may impose hidden welfare costs due to pollution exposure. However, evidence regarding the effects of public transportation on academic achievement in developing countries is limited nations. Bus Rapid Transit (BRT) systems that rely heavily on pollutant fuels can influence educational outcomes by negatively affecting students' health and daily routines. We assess the impact of BRT-related pollution from Bogotá's BRT system, TransMilenio, on student academic performance by leveraging exogenous variation in wind direction and route intensity. Our findings indicate that a one-unit increase in particulate matter (PM_{2.5}) reduces math scores by 0.014 standard deviations, with more pronounced effects on female students and those from higher-income families. Additionally, we show that the increases in the risk of respiratory diseases might explain these pollution's negative effects on education outcomes. Our results show the negative externalities of transportation infrastructure and its impacts on human capital development and public health, emphasizing the need for policy interventions to mitigate the environmental impact of mass transit systems in developing cities.

Keywords: Academic performance, Transportation infrastructure, Air pollution

Nudging Procrastination Away: The use of simplification and reminders in a dissertation project

Panagiotis Giannarakis (University of Southampton, UK)

Emanuela Lotti (University of Southampton, UK)

Literature has established the detrimental effect that procrastination has on higher education student performance. There is a growing literature on nudges in the context of education, however there is a relatively sparse research on the joint role played by both time and risk preference on student procrastination. We apply a combined experimental and randomised control trial approach. We measure time and risk preferences for a cohort of students in an online experiment and then administer a weekly reminder nudge for the Treatment Group which we use to remind the students of a task list - a simplification tool available to all. We find that the intention to treat has no significant impact on either grades or submission time. However, the nudged students were significantly more likely to interact with the task list and these students, who consumed the treatment, received significantly higher grades than those who did not. If we look at subgroup effects we find that students who are risk averse tend to submit earlier, although they do not necessarily receive higher grades, and that treating this group leads to significantly earlier submission. Finally, we find that the self-reported and experimental measures of procrastination are poor predictors of actual behaviour, while a direct measure of procrastination on a low stakes online test is significantly related to lower grades. These findings suggest that the task breakdown checklist can be a helpful tool for long term assessment but that weekly reminders on their own are insufficient.

Keywords: Procrastination, Dissertation, RCT

School management and outcomes in Brazil: insights into leadership practices

Victoria Jaeger (Instituto Unibanco)

This study aims to evaluate the factor structure of a school management instrument to validate its ability to adequately capture management practices and subsequently investigate the relationship between school management and educational outcomes in the Brazilian context. Using the School Management Practices Instrument (IPG), which maps the occurrence of 140 practices in public schools, the study identifies latent variables of school management through Exploratory Factor Analysis and examines the relationship between these factors and academic performance. The analysis covers topics such as pedagogical management, data usage and monitoring, human resources, administration, and school identity. The results highlight the importance of effective school management for improving educational outcomes, providing support for the formulation of public policies and the refinement of instruments that measure management in Brazilian schools.

Keywords: School Management, Public Education, Brazil

La Educación Técnica en la Transición a la Educación Superior: ¿Un Amplificador de las Desigualdades Sociales?

Alexander Villarraga-Orjuela (Universidad del Norte)

Carlos Hoyos-Ponton (Children International Colombia)

A través de la conformación y el seguimiento de trayectorias educativas de estudiantes, desde su paso por la educación media hasta la educación superior, se busca determinar el impacto de la formación técnica durante el colegio en las oportunidades de transición a la educación superior. Para el análisis se utilizan los registros públicos de las pruebas SABER11, SABERPRO y SABERTYT, y con el enfoque metodológico de Mare (1980, 1981), se usa un estimador doble robusto, basado en la ponderación inversa por probabilidad y el ajuste de regresión (PIPAR) Wooldridge (2007, 2010). Se encuentra que existe predilección de estudiantes con menor estatus socioeconómico a matricularse en bachillerato técnico. La educación técnica en el colegio reduce la posibilidad de tránsito a educación superior en (3,6%) para estudiantes matriculados. Este efecto es equivalente a (0,28) desviaciones estándar. Cuando se discrimina por estatus de origen, el efecto promedio se encuentra entre (-5,9%) y (14,6%) sobre la probabilidad de transición. También, cuando se consideran indicadores asociados a la calidad del colegio, este se ubica entre (-4,3%) y (1%). Y al revisar la relación de estos efectos con interrupciones del ciclo escolar, se observa que pueden alcanzar hasta (-11,3%). Estos resultados sugieren que las condiciones actuales del bachillerato técnico pueden amplificar la influencia del origen socioeconómico en el tránsito en perfiles vulnerables, exacerbando la desigualdad de oportunidades educativas, y dificultando la movilidad social. Los resultados son consistentes a pruebas de sensibilidad y poder estadístico.

Keywords: educación media técnica, desigualdad educativa, trayectoria educativa, transición educativa, doubly robust estimation

More Time, Better Learning? Evaluating Full-Time High Schools in Ceará, Brazil

Pedro Veloso (CAEN/UFC)

Guilherme Irffí (Universidade Federal do Ceará)

Luiz Guilherme Dacar da Silva Scorzafave (USP)

Leonardo Rosa (Instituto de Estudos para Políticas de Saúde / IEPS)

Roberta Loboda Biondi Nastari (LEPES/USP-RP)

Maria Isabel Accoroni Theodoro Habenschus (LEPES/USP-RP)

Francisco Araújo (LEPES/UFC)

The increase in investment in basic education in Brazil over the past two decades has not led to proportional improvements in educational indicators, especially in high school. Demographic transition and population aging have reduced enrollment numbers, creating an opportunity for more costly policies, such as expanding full-time schooling to improve education quality. High school reform and the National Common Curricular Base (BNCC) offer opportunities to make this stage more attractive and reduce dropout rates. This study assesses the impact of Full-Time High Schools (EEMTI) in Ceará, focusing on schools converted in 2016 and 2017. Ceará, one of Brazil's poorest states, has heavily invested in full-time schools to improve educational indicators. The study covers 2016 to 2019, tracking students from their first year of high school through graduation. The methodology estimates the average causal impact of EEMTIs on Portuguese language and mathematics proficiency in the third year of high school and the likelihood of dropping out. Additionally, the analysis examines differential effects based on student and school profiles and explores potential mechanisms behind the policy's impact. Preliminary results show positive effects on mathematics and Portuguese language scores and decreased dropout rates, confirming findings from previous studies in other Brazilian states.

Keywords: Full-Time Schools, High School, Brazil

Was I good enough? The Dynamic Consequences of High School Ranking

Paola Bordon (Universidad de Chile)

This study examines the impact of high school ranking on students' educational choices and performance. Using data from a cohort of Chilean high school students, we track their academic trajectories from age 14 through their decisions regarding higher education, including their performance on the national college entry exams (PSU). To address the endogeneity of non-random class assignments, we introduce theoretical rank as an instrument, leveraging the predictable relationship between school-wide ranking and class sizes. Our analysis estimates the influence of high school rank, independent of ability, on subject specialization and PSU scores. Results indicate a significant positive effect of rank on both academic performance and subject selection, particularly for students at the top and bottom of the ranking spectrum. Rank proves especially influential in grade 12, as it is closest to the PSU exam. Moreover, we observe gender differences in response to ranking, with males appearing more likely to use ordinal rank as an ability signal or leverage it for academic advantage. Our findings also highlight the dynamic nature of ranking effects. Students respond to shifts in their rank, with particularly strong reactions observed in mathematics and among male students. These results have implications for feedback mechanisms in schools, universities, and workplaces. Recognizing high performers through symbolic awards or scheduling targeted interventions for struggling students could enhance motivation and outcomes. Additionally, ranking influences broader support networks, such as parental expectations and teacher-student interactions. Parents of higher-ranked students report increased educational aspirations, leading to greater investment in academic success. Teacher evaluations suggest that top-ranked students benefit from pedagogical adjustments tailored to their needs. These insights demonstrate that ranking functions both as a motivational tool and an informative signal, shaping educational decisions and long-term academic trajectories. This study examines the impact of high school ranking on students' educational choices and performance. Using data from a cohort of Chilean high school students, we track their academic trajectories from age 14 through their decisions regarding higher education, including their performance on the national college entry exams (PSU). To address the endogeneity of non-random class assignments, we introduce theoretical rank as an instrument, leveraging the predictable relationship between school-wide ranking and class sizes. Our analysis estimates the influence of high school rank, independent of ability, on subject specialization and PSU scores. Results indicate a significant positive effect of rank on both academic performance and subject selection, particularly for students at the top and bottom of the ranking spectrum. Rank proves especially influential in grade 12, as it is closest to the PSU exam. Moreover, we observe gender differences in response to ranking, with males appearing more likely to use ordinal rank as an ability signal or leverage it for academic advantage.

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Keywords: gender achievement gaps, High school ranking, dynamics, education outcomes

Analysis of the Effects of Attending Early Childhood Education on Performance in Elementary Education in Brazil

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Larissa Carneiro (Universidade Federal do Ceará)

Guilherme Irffi (Universidade Federal do Ceará)

This article presents new evidence on the performance differentials among 5th grade students who attended or did not attend early childhood education, using data from the Basic Education Assessment System (SAEB) and three identification groups: one to capture the daycare effect, another to estimate the preschool effect, and a third to evaluate the combined effect of early childhood education (daycare and/or preschool). The empirical analysis investigated the effect of early childhood education on the mean and distribution of grades in Portuguese and Mathematics, using Propensity Score Matching (PSM) and Quantile Treatment Effect (QTE) by Firpo (2007), respectively. The results from both methodologies showed a positive effect of early childhood education in all groups and subjects analyzed. Specifically, attending early childhood education had a positive and more pronounced impact on students with higher scores in both subjects, with the magnitude of the effect of preschool and early childhood education being greater than the effect of daycare throughout the entire distribution of grades. When the sample was segmented by the mothers' level of education, it was observed that the daycare effect was more pronounced for students whose mothers have a higher level of education. The preschool effect also showed this trend, but from the median onward, it was more significant for students whose mothers have lower educational levels. These results emphasize the importance of educational policies aimed at improving the quality of daycares and preschools to reduce educational disparities in the country.

Keywords: Daycare, Preschool, Early Childhood Education, PSM, Quantile Regression

First Steps to Success: Literacy and Academic Achievement in Early Education

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We examine the relationship between children's literacy quality by the end of the 2nd grade of primary education and their performance on assessments in the 5th grade. To answer this question, we analyze student proficiency data from municipal public schools in Ceará, Brazil, for the relevant years. The SPAECE-Alfa assessment evaluates students' early literacy skills at the end of the 2nd grade, while the SPAECE 5th grade test measures proficiency in literacy and mathematics at the end of the 5th grade. Our study follows students in the 2nd grade in 2016 and the 5th grade in 2019. Additionally, we selected a representative sample of schools from other Brazilian municipalities, focusing on those with low performance in SAEB, a national evaluation of literacy and mathematics proficiency. Using students who had never repeated a grade, we estimated logarithmic prediction models. We also conducted a sensitivity analysis with students who had repeated a grade and a robustness analysis using panel data from 2007 to 2019. In every case, the results remained consistent, showing that literacy at the right age (2nd grade) is the strongest predictor of 5th-grade proficiency, surpassing demographic, economic, and school location factors. From a public policy perspective, our findings suggest prioritizing education quality in the early years, particularly literacy at the right age. Furthermore, students with higher literacy levels have a greater chance of achieving strong performance in the 5th grade, regardless of school delay status.

Keywords: literacy at the right age, 5th-grade proficiency, quality of education

Net gains: an investigation of telematic universities' academic performance

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In recent years, the rise of telematic universities has emerged as a noteworthy phenomenon in Italy. These institutions offer a wide range of educational programs, leading to a shift in the landscape of tertiary education in Italy and altering the dynamics of competition with traditional public universities. To date, there are 11 telematic universities offering online degree courses. By now, more than 10% of university students are enrolled in a distance learning institution. According to USTAT data, in 2008/09 there were 20,874 enrolled in degree courses in these universities out of approximately 1.8 million; in 2011/12 they were 40,164 out of 1.75 million, in 2015/16 they were 62,276 out of 1.65 million. In the last academic year 2022/23, there were 251,017, accounting for 13.15% of those enrolled in a degree course, while the previous year there were 223,937 and in 2020/21 (the year of the pandemic) 184,901 (ANVUR 2023). A large part is mature students. Among the enrollees in distance universities, there is a significant presence of workers over 31 years old. According to the ANVUR report 2023, indeed, in the academic year 2021/22, 80% of students in traditional universities were under 26 years old, but in distance learning institutions they were only 34%, while about 57% (almost 2/3) were at least 28 years old and over 45% (almost half) were over 31. In traditional universities, 80% of graduates were 23 years old (compared to 66.5% in the academic year 2011/12), while in distance learning institutions they were only 20.6% and almost 60% of graduates were at least 28 years old. An important part, therefore, is already integrated into the job market and enrolls in a distance learning institution to complete their university career: over 70% of them come from state universities (ANVUR 2023). These universities are regulated by the decree of April 17, 2003, issued by the Ministry of Education, University and Research, which outlines all the requirements that Italian universities must meet to be recognized. This ensures that online degree qualifications are equivalent to those obtained from traditional universities (i.e. with the same legal value). Telematic degree courses are diverse and include popular disciplines such as Engineering, Computer Science, Economics, Law, and Psychology. Many questions remain unanswered regarding the significance and consequences of these alternative educational routes. In this paper, we aim to leverage a 2016 reform that introduced the recruitment of permanent faculty members within telematic universities. Prior to 2016, these universities primarily relied on short-term teaching contracts, frequently hiring individuals from other universities or the workforce. However, since 2016, telematic universities have been required to employ staff at various levels such as researcher, associate professor, and full professor, albeit incurring higher costs. Distance learning institutions are indeed characterized by a reduced permanent staff, and beyond the minimum requirements, distance universities show an abnormal ratio between students and permanent faculty. The problem lies not only in the minimum number of tenured

professors required to activate a study program, according to the criteria and accreditation platforms set by ANVUR and the Ministry. The issue is the ratio between the total number of permanent faculty and the number of students they must serve. This ratio is considered central in evaluating any university and, in general, any university system. This ratio not only pertains to teaching (i.e., the direct relationship between teacher and student in education) but also to the ability to participate and interact during educational activities that extend beyond the classroom in academic paths (such as laboratory work, seminars, or support in constructing and preparing the final project). In Italy, the overall university system has a student-to-faculty ratio of about 1/30. Italian distance learning universities, however, have a student-to-permanent-faculty ratio of a different order of magnitude: according to the ANVUR Report (2023), it increased from 152.2 in 2012 to 384.8 in 2022 (almost thirteen times higher than traditional universities). However, the 2016 reform, by increasing the proportion of structured faculty, not only raised personnel costs but also led to greater continuity in teaching. Utilizing the administrative data from the National Archive of Students and Graduates (i.e. Archivio Nazionale degli Studenti e dei Laureati, ANS) provided by the Ministry of University and Research (MUR). We investigate the administrative data regarding the academic careers of students between 2011 and 2019, so that we can test this change in the faculty on academic outcomes without being influenced by the effects of Covid-19. The sample analysed includes about 2,500,000 students at their first enrolment in the Italian HE system. This natural experiment enables us to investigate how student performance evolved in both the short and long run. We hypothesize that educational continuity might have contributed to influencing several academic outcomes, namely dropout, number of credits achieved, average grades, graduation. As private institutions, telematic universities could provide a variety of services to their students. A preliminary analysis indicates that the continuity of teaching has resulted in a decline in student grades in recent years (excluding factors related to the pandemic). The reasons for this decline can be varied and are currently under investigation. Among the pre-university enrollment control variables, we are also verifying whether we can include, at least for some cohorts, the INVALSI data recorded during the school path.

Keywords: academic outcomes, administrative data, students' performance, telematic universities

Private Resources in a Public School: To What Extent Does Educational Success Depend on Paid Extracurricular Activities?

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One of the fundamental tasks of public education is to equalize the life opportunities of students from different backgrounds and varying levels of wealth. At the same time, however, education is built on competition among students, and the possibility of choosing an educational path often depends on performance in high-stakes exams. Educational opportunities may thus depend on the ability to mobilize additional resources and on the access to paid courses and tutoring. Although much has been said on how dependence on paid tutoring can disrupt the equity in public education, there are few studies that actually estimate the impact of private resources on student achievement. This article aims to assess the impact of private lessons on student achievement in Polish public schools—both at the eighth-grade level, when students take the final exam concluding primary education, and at the high school level, during the Matura exam that marks the end of secondary education. The study is based on administrative data from the Polish Central Examination Commission, supplemented by an additional questionnaire completed by students.

Keywords: Equity in education, Standardised tests, Private tutoring

TV Digital Transition in Italy and the Impact on Pupils' Academic Performance

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This paper studies the impact of television on student achievement in Italy, utilizing the staggered rollout of digital television across Italian provinces to isolate television's influence. Using data from national educational assessments (INVALSI) collected in four grades from 2009 to 2012, we uncover a negative effect of television on school performance by applying difference-in-differences techniques. We observe a positive correlation between TV viewing and test scores for a subset of the survey. Still, the negative impact is partly confirmed when instrumenting hours of view with the availability of digital channels. We also find significant heterogeneity: foreign-born pupils benefit from the greater availability of TV channels, while children with graduate parents experience less significant achievement losses.

Keywords: Italy, school performance, digital television switchover

Construcción de un indicador de pensamiento creativo: Un análisis exploratorio con datos de PISA 2022

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El pensamiento creativo es una competencia clave en la educación y la resolución de problemas, con impacto en la innovación y la adaptabilidad. Sin embargo, su medición representa un desafío, ya que es una variable latente que no se puede observar directamente. Este estudio desarrolla un indicador de pensamiento creativo, basado en un marco teórico interdisciplinario y en datos de PISA 2022. A partir del análisis de preguntas de PISA, se identifican y agrupan variables en dimensiones que operacionalizan esta competencia. Para ello, explora patrones en las respuestas de los estudiantes, con el fin de construir una clasificación coherente que refleje las manifestaciones del pensamiento creativo en el contexto educativo. La construcción del indicador sigue un enfoque de variables latentes, aplicando la Teoría de Respuesta al Ítem (IRT) para estimar puntuaciones plausibles. Mediante un Generalized Partial Credit Model (GPCM), se calculan los parámetros de dificultad y discriminación de los ítems, generando una escala continua y estandarizada de pensamiento creativo. El análisis metodológico incluye un estudio descriptivo de la distribución del pensamiento creativo en la muestra, seguido de estimaciones estadísticas para validar la estructura del indicador y su relación con el rendimiento académico. La fiabilidad se evalúa con el Alfa de Cronbach, y se incorporan controles sociodemográficos para garantizar la robustez de los resultados. Los hallazgos obtenidos contribuyen a una mejor comprensión del pensamiento creativo en estudiantes de secundaria y proporcionan herramientas para la formulación de políticas educativas que promuevan la creatividad como una competencia esencial en el currículo escolar.

Keywords: pensamiento creativo, rendimiento académico, educación, indicador, PISA 2022

Mitigating teacher shortages: The role of school leadership in retention and recruitment

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Teacher shortages represent a growing challenge worldwide, with school leadership and effective personnel policies playing a central role in recruitment and retention. Despite similar school contexts, some schools manage to recruit and retain sufficient teachers, whereas others struggle. This study examines how induction policies and broader personnel strategies influence teacher retention and the ability to fill vacancies, by contrasting schools in the highest- and lowest-retention quartiles. A large-scale survey of school leaders (N=271 for personnel policy, N=294 for induction policy) was administered across regular and special primary and secondary schools. Stratifying by retention quartiles allowed direct comparisons of high- and low-retention schools. Factor analyses identified underlying policy dimensions within the survey, and double-selection lasso regressions isolated the most influential factors. Finally, a comprehensive administrative panel dataset (2018–2022) from the Flemish Ministry of Education provided a rich set of control variables at both the teacher and school levels. Results reveal that a clearly defined induction vision and strategy, tailored to the needs of new teachers, substantially improves retention. Targeted training initiatives are linked to a reduced likelihood of teachers leaving the profession. Moreover, professional development approaches play a dual role: schools emphasizing collective, goal-aligned growth and collaboration have fewer unfilled positions, whereas those offering primarily individualized approaches face more challenges in filling positions. These findings highlight that a clearly articulated induction strategy, coupled with aligned personnel policies, can significantly alleviate teacher shortages.

Keywords: Teacher Retention, Teacher Shortages, Induction Policy, Personnel Policy, School Leadership

Beyond Tuition Expenses and Student Performance: The Role of School Composition and Curiosity Based on the Evidence from PISA 2022 Hong Kong

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This paper focuses on tuition expenses in Hong Kong, using the PISA 2022 dataset. The results show that the expense of tuition is not relevant to student performance in any of the subjects studied by the OECD programme, after controlling for gender, grade, and economic social and cultural status (ESCS). Additionally, leveraging data on the new creativity topic provided by this wave of PISA, we have found further evidence that increased tuition expenses do not relate to higher creativity after controlling for gender, grade, and ESCS. Moreover, it is curiosity that triggers not only creativity but also performance in mathematics, reading, and science.

Keywords: Tuition Expense, Curiosity, School Composition, PISA 2022

Beyond Test Scores: The Effect of School Entry Age on Cognitive Processes

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While previous research has primarily examined the effects of school entry age on achievement test scores and long-term outcomes, the cognitive mechanisms driving these effects remain underexplored. This paper investigates how school entry age influences specific cognitive abilities within the Cattell-Horn-Carroll (CHC) intelligence framework, leveraging unique psychometric data that provide a more detailed assessment than previous measures. To identify causal effects, we exploit statutory school entry cutoff rules in the Czech Republic within a regression discontinuity design, leveraging variation across grades and birth cohorts to disentangle key components of the overall school entry age effect. Our results show that later school entry enhances inductive reasoning and learning effectiveness. The former is primarily driven by within-grade maturity at the time of testing (absolute age effect), while the latter is shaped by relative age within the classroom (relative age effect) and developmental factors (school readiness) at school entry (net school entry age effect).

Keywords: School Starting Age, School enrollment, cognitive skills, test score

Open the flood gates or skim the cream? Selective vs. open enrollment policies and the race for talent in Italy

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The predicted decline in the number of students attending higher education due to population ageing, as well as the resulting increased rivalry for a scarce resource, will put Italian universities under strain creating incentives to reduce selectivity. Yet, increasing enrollment might further reduce demand by lowering the average quality of students, diluting the degree signal, possibly to the detriment of high-achieving students due to negative peer-effects. Thus, universities face a trade-off in increasing the supply of college-educated workers in their region while competing with other universities on the quality margin. We ask how this inter-university competition plays out and what effects it might portend on the future supply of college-educated labor in Italy. We show that while institutions in Northern Italy have steadily increased the proportion of selective admission programs, those in Southern Italy have reduced it. This reduced the number of Southern Italians enrolling in selective Northern programs, but increased the average quality of those students considerably. We also show that when programs shift to selective enrollment graduation rates and student marks increase, though the total number of graduates is lower. In ongoing work we are estimating the relative contributions of smaller classes and peer effects due to composition to this phenomenon. Our main results suggest that inter-university competition has the potential to exacerbate the North-South race for talent.

Keywords: school quality, college enrollment, college admissions

In-group Bias in Academic Grading: The Role of Geographic Origin on Student Evaluations

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This study investigates the potential contribution of university professors' geographic origins on biases in student grading. Utilizing a comprehensive dataset from an Italian university spanning from 2016 to 2023, we examine whether a sense of local identity among professors affects their evaluation decisions, particularly towards students whose surnames are commonly associated with the local area. The findings reveal a statistically significant positive bias in favor of students with common local surnames, particularly pronounced among professors who themselves originate from the same geographic region. This bias decreases with increasing geographic distance, highlighting how regional identity can subtly play a role in academic evaluations.

Keywords: Academic performance, grading, similarity effect, surnames, bias

How Socioeconomic and Parental Background Shape Peer Networks and Educational Outcomes

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This paper studies how socioeconomic background and student characteristics affects friendship formation and student educational outcomes using data from two Norwegian middle schools. We find strong, significant effects of parental background, such as age, ethnic background and social security status, in student friendship formation. There are also effects of parental income, but no significant effects of parental wealth. However, the strongest effects are from being the same gender and being in the same class, and there are some assortative skill matching in friendship formation. We further estimate spillovers between students using pre-existing skills as an instrument. We find strong spillovers, with a standard deviation increase in friends GPA leading to a 0.5-0.6 SD increase in a student's own GPA. Finally, we use our estimates to show how classroom structure affects GPA by affecting student friendships, finding that the realized network has a large impact on each students realized outcome. In total, our results show how affecting student friendships may be a feasible and useful tool for policy makers aiming to improve student outcomes.

Keywords: educational outcomes, parental background, Spillovers, Social Networks

Financial Literacy and Financial Prudence: Results of a Pilot Study for the Experimental Evaluation of a Basic Finance Course

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This paper presents the preliminary findings of a pilot study aimed at testing, within a small-scale setting, a research design intended to evaluate the impact of an educational program on finance and taxation targeted at a sample of young people in Spain. The pilot study, conducted with doctoral students from Iberus Campus, constitutes a quasi-experimental approach; therefore, its conclusions should not be interpreted in causal terms. Moreover, the limited sample size constrains the generalizability of the results. Nevertheless, the data collected suggests the existence of interesting associations that will be explored more rigorously in the definitive study. Despite its limitations, we believe the subject is of high relevance to the field of Economics of Education. While the crucial role of financial literacy in shaping individuals' life trajectories is widely acknowledged, there is a notable scarcity of research on this topic in Spain—especially studies conducted from an economic perspective. The findings indicate that even among a highly educated population (all participants were university graduates pursuing doctoral degrees), basic financial knowledge is relatively limited. A structural equation model estimated using data from a pre-course survey reveals a positive association between basic financial literacy and prudent financial behaviors.

Keywords: financial literacy, financial prudence, experimental evaluation

CHAPTER 3

EDUCATION AND INEQUALITY

CAPITULO 3

EDUCACIÓN Y DESIGUALDAD



Tiempo de transición de la educación media a la educación universitaria en Colombia

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Este artículo analiza las variables que inciden en la transición de la educación media a la educación universitaria en Colombia. Para ello, aquí se sigue a los estudiantes que presentaron la prueba Saber 11 en 2016 y Saber Pro en algún momento del tiempo hasta el año 2021. A partir de la información de 44,906 correspondientes al “match” existente entre la base Saber 11 y la base Saber Pro, se estima un modelo de duración con sesgo de selección. Nuestros resultados muestran que en Colombia ser mujer aumenta la probabilidad de no entrar a la educación universitaria, a mayor edad mayor es la probabilidad de no entrar a la universidad. Cuando la madre y el padre del estudiante tienen educación universitaria se reduce la probabilidad de no entrar a la universidad. Los estudiantes de Bogotá, Cali, Medellín y Barranquilla tienen más probabilidad de entrar a la universidad que aquellos que están en otras ciudades, entre otros resultados. De esta forma, la política educativa deberá tener en cuenta estas variables a la hora de establecer/implementar mecanismos de acceso a la educación superior.

Keywords: Tiempo de duracion, sesgos de seleccion, saber 11, transicion educacion secundaria a universitaria

The Effect of Anticipating Performance Requirements in Need-based Grants: A Natural Experiment.

Giuseppe Pignataro

Does anticipating merit requirements for a scholarship help students from disadvantaged families pursue their university careers? Using a unique reform of the Italian financial aid program, we estimate the impact of need-based grants on student performance in a scenario where students have the option to receive an advance on the scholarship if they earn a certain number of credits. Offering this option systematically increases the number of credits and, as a consequence, the probability of success in confirming the grant, but -- as a side effect -- it induces students to postpone exams with a larger number of credits, with a reduction in the number of passed ones and in the average grades for a portion of the student distribution.

Keywords: Scholarships, Tertiary Education, Merit-based Requirements

Shadow Education in the Context of Hierarchical Tracking: Socioeconomic Differences in Parental Investments

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Educational tracking is relatively commonplace, though differential accession to the highest track conditional on socioeconomic status often exacerbates educational inequalities. However, while existing research documents the existence of direct effects of tracking on student achievement, the mechanism via which this occurs is less well-understood, particularly in a causal setting when abstracting from positive selection effects. One potential explanation that remains underexplored in the literature is that tracking policies indirectly influence student outcomes by altering parental behavior. Leveraging a pseudo-regression discontinuity design based on score cut-offs in the track assignment process, we demonstrate how assignment to a higher academic track leads to systematic differences in parents' willingness to invest in supplementary tutoring. Our identification strategy exploits quasi-random variation in track assignment near these cut-offs, allowing us to isolate the causal effect of track placement on parental investment decisions. This approach addresses potential endogeneity concerns which have historically complicated research on the relationship between institutional structures and family-level educational choices. Namely, better students differentially enrol in the highest track due to a combination of endogenous preferences for high-track programs and selection on the part of schools. Our results indicate differences in post-assignment participation in private tutoring by track type and SES: assignment to the highest track disproportionately increases parental investment in tutoring for families in the lowest and intermediate tercile of SES. This suggests that school tracking not only affects students' academic opportunities but also activates a behavioral response in parents, particularly those from disadvantaged backgrounds. For low SES families in particular, gaining access to a higher-track school or program may serve as a signal that their child has potential for upward mobility, motivating parents to reallocate limited resources toward tutoring. We thus provide novel evidence for the role of institutional signals in shaping parental investment strategies.

Keywords: inequality of opportunity, school choice, tutoring

Determinants of Switching Higher Education Degrees

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While higher education decisions have been studied for bachelor's level relatively more in economic literature, less attention is paid to decisions pertaining to postgraduate education. This paper aims to contribute to this literature by exploring existing inequalities in transitioning to master's education and educational mobility In Portugal. For this purpose, we utilise large dataset of bachelor's graduates from Portuguese higher education institutions. The results show substantial differences in transition and mobility rates regarding gender, broad field of study, the ranking of the bachelor higher education institution, as well as whether students are first in family (FiF) to attend higher education. Further analysis shows that the differences between FiF and non-FiF graduates become smaller depending on the ranking of bachelor institutions, but not the field of study at bachelor level.

Keywords: Higher Education, inequality, Mobility, Postgraduate transitions

The Effect of High-Speed Railways on University Student Flows

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Geographical accessibility plays a crucial role in shaping higher education choices, particularly influencing students' decisions about where to enroll. In this study, we examine the impact of high-speed railways (HSR) on university student flows in Italy. The introduction of new HSR routes can reduce travel times, facilitating commuting and improving connectivity between students' home municipalities and higher education institutions (HEIs). This effect is particularly relevant in a country like Italy, where both economic constraints and regional disparities in education quality and labor market opportunities influence student mobility patterns. To empirically assess the impact of HSR expansion on university enrollment patterns, we employ a gravity model of student mobility combined with a difference-in-differences (DiD) approach. The gravity model allows us to account for the attractiveness of different HEIs based on factors such as distance and institutional characteristics, while the DiD design exploits the quasi-experimental variation introduced by the opening of a new HSR station in Reggio Emilia (Mediopadana), which improved rail connections to Milan and Bologna. Our analysis is based on administrative microdata from the Anagrafe Nazionale degli Studenti e dei Laureati (ANS), which provides detailed information on the entire population of Italian university students, including their upper secondary school location, chosen degree programs, and enrollment destinations. By investigating whether the introduction of new HSR routes alters students' enrollment patterns—either by increasing the attractiveness of universities near HSR stations or by expanding students' feasible choice sets—we contribute to the limited but growing literature on the role of transportation infrastructure in shaping educational mobility. Our findings will have implications for higher education policies and regional development, particularly in assessing how infrastructure investments can influence student flows and educational opportunities across different areas.

Keywords: students participation, mobility restrictions, college enrollment

Neighbor Effects and Early Track Choices

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The choice between vocational and academic education at the end of secondary school has important long-run effects, and is made at an age where peers' influence might be paramount. In this paper, we investigate the effect of neighbors' track choices on 9th graders choices at the end of lower secondary education, in Paris. This question is central to understand the extent to which residential segregation can reinforce social segregation across vocational and academic tracks. We rely on neighbors from the preceding cohort in order to bypass the reflection problem, and use within-catchment-area variation in distance between pairs of students to account for residential sorting. We use a pair-wise model that enables us to carefully study the role of distance between neighbors, considering distance in a continuous way, while the literature typically looks at neighbors within a given range, and to better understand the underlying mechanisms by studying the heterogeneity of peer effects with respect to peer characteristics (in particular gender and socio-economic background). Our results suggest that close neighbors do influence track choices at the end of 9th grade, particularly for pupils pursuing a vocational track. This effect is driven by neighbors living in the same building, and is larger for pairs of boys and for pairs of pupils from low social background. Overall, our results suggest that neighbor effects tend to accentuate social segregation across high school tracks.

Keywords: Peer Effects, track choice, fixed effect model, Neighbor effects, Segregation

What is the relationship between access and funding for early childhood education? A spatial analysis in the region of Sudene's area of operation

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This study examines the relationship between access to and funding for early childhood education in the Superintendency of the Development of the Northeast (Sudene). To achieve this, data on early childhood education spending and transfers from the Fund for Maintenance and Development of Basic Education (FUNDEB) received by municipalities from 2009 to 2019 are used. Using Exploratory Spatial Data Analysis (ESDA), patterns of local spatial autocorrelation were identified, revealing that municipalities with high school attendance rates (TAE) are surrounded by other municipalities with similarly high TAE. Likewise, municipalities with low TAE are often near others with similarly low TAE. The application of spatial models showed that a 1 percentage point increase in spending on early childhood education resulted in an approximate 0.19 percentage point increase in access to daycare for children aged 0 to 3 years, and a 0.10 percentage point increase for children aged 4 to 5 years. These findings may be related to the fact that, for children aged 4 to 5 years, access to education is more equitable and closer to universal coverage in most municipalities in the Sudene region. The results also suggest a persistence of spatial autocorrelation over the 10-year period analyzed, indicating that despite observed growth in early childhood education investment, this has not yet led to a structural change across the entire region or in all educational stages. Therefore, regional education policies should focus on clusters of municipalities to maximize the impact of investments and leverage spatial spillover effects.

Keywords: School attendance rate, Financing, Spatial models

Overeducation among Master's Graduates in the Humanities in Spain

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Diversos trabajos señalan a los graduados en Humanidades como los más afectados por el fenómeno de la sobreeducación. En este artículo, examinamos el efecto de la realización de un máster en la sobreeducación para los graduados en Humanidades en España, distinguiendo según la rama de conocimiento del posgrado realizado. Se utiliza la encuesta EILU-19 del INE. Se construye un único indicador de sobreeducación utilizando conjuntamente los criterios subjetivos y objetivos. Empleando modelos de regresión logística y Propensity Score Matching los resultados indican, por una parte, que hacer un máster en cualquier área reduce la sobreeducación de los graduados en Humanidades. Por otra parte, la realización de un máster en el área de Educación reduce sustancialmente la sobrecualificación, mientras que si el máster se realiza en otra área no se aprecian diferencias significativas con respecto a realizarlo en Humanidades.

Keywords: desajuste educativo, máster, sobreeducación, EILU, humanidades

Efficiency, Inequality, and Educational Quality in Higher Education in Colombia: A Value-Added Approach

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Educational effectiveness and efficiency are crucial for policy design, requiring a balance between both aspects (OECD, 2006). As budget constraints grow, studies on educational efficiency have gained importance (Cordero et al., 2018; López-Torres & Prior, 2016). Recent research has increasingly focused on educational inequality and inequity (Arbona et al., 2021; Giménez et al., 2017), aligning with Tsai et al. (2017) who highlight excellence and equality as key policy goals. While educational efficiency remains a relevant topic, there is still a gap in the literature addressing it from an inequality perspective. The main objective of this study is to evaluate the change in productivity of 115,605 students in terms of value added, from secondary education to higher education, between 2014 and 2022, considering performance and educational inequality. Additionally, there are two specific objectives: first, to characterize students based on their productivity level; second, to analyze differences between the public and private sectors. This study is conducted using the Malmquist Luenberger Metafrontier (MML) index developed by Oh (2010). This index performs a temporal analysis while incorporating both good and bad outputs of the process. This is done through the use of the Directional Distance Function (DDF), which intuitively evaluates how value-added increases while the standard deviation of the process decreases. To analyze the change in student productivity, a database is constructed containing information from the Colombian Institute for the Evaluation of Education (ICFES). The standardized tests Saber 11 and Saber Pro, which assess students at the end of secondary and higher education, respectively, are used. These databases allow for tracking students over time, making them ideal for value-added analysis. The contribution of this work to the literature is twofold: first, it is the first study to analyze educational efficiency while including inequality in the process with value-added measures; and second, it is the first approach to an efficiency study considering inequality in the higher education process; and third, it responds to requests from related research requiring the application of variables that consider multiple dimensions of standardized tests in evaluation processes (Agasisti et al., 2016).

Keywords: Efficiency, value-added, inequality, higher education

Oil Royalties and Early Childhood Education Services in Brazil: A Panel Data Analysis (2007-2019)

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Este estudo tem como objetivo analisar o efeito do recebimento de royalties do petróleo sobre a Taxa Líquida de Escolarização (TLE) de crianças de 0 a 3 e de 4 a 5 anos. O objetivo foi verificar se os municípios que receberam esses recursos estão mais próximos de atingir a Meta 1 do Plano Nacional de Educação (PNE/2014), que consiste em universalizar o atendimento pré-escolar para crianças de 4 e 5 anos e atender pelo menos 50% das crianças de 0 a 3 anos em creches. Para tanto, foi construído um painel com informações dos municípios brasileiros referentes aos anos de 2007 a 2019 e adotada a estimação de modelos de efeitos fixos como estratégia empírica. Os resultados indicam que os municípios que receberam royalties, em algum momento ou durante todo o período analisado, atendem, em média, 1,7 pp a mais de crianças de 0 a 3 anos em creches, porém, não foi encontrado efeito sobre o LED das crianças de 4 e 5 anos. Assim, pode-se inferir que o recebimento de royalties contribui para a frequência de crianças na educação infantil, especialmente em creches, o que pode contribuir para o alcance da Meta 1 do PNE 2014-2024. Além disso, observou-se que o nível de escolaridade das mães e a massa salarial per capita também contribuem positivamente para o LED.

Keywords: Early Childhood Education, Net School Enrollment Rate, Oil Royalties, Fixed Effects

Incentivized to Lower Their Efforts? Understanding the Career and Earning Motivation of Young Professionals in an Income-Based Tertiary Education Financing Program in Rwanda

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In recent years, Income Share Agreements (ISAs) have gained popularity as an inclusive education financing option in low- and lower-middle-income countries (LLMICs). In an ISA, an investor covers a student's education costs, and in return, the student commits to paying a percentage of future monthly income over a set period. Unlike loans, ISAs do not require credit checks or collateral, making them accessible to financially constrained youth. At the same time, economic literature suggests that income-based payments may incentivize ISA-takers to reduce their efforts. Because a share of their income goes to repayment, they receive a lower return to their labor, potentially depressing their earning and career motivation. This case study provides the first empirical investigation of the relative importance of such motivational effects in education financing in LLMICs. Using data from 26 semi-structured interviews with young professionals in Rwanda, it explores the earning and career motivation of ISA-takers. A comprehensive thematic analysis identifies the central themes in participants' statements on unemployment, job search, workload, earnings, their willingness to increase their workload and earnings, their perceived competitiveness, labor market conditions, and the relationship between their ISA and working life. Findings suggest that negative motivational effects of income-based payments are not decisive in explaining individual motivation in the volatile economic environment of LLMICs. Instead, economic vulnerability and the risk of poverty emerge as key motivational drivers. Due to limited job availability, individuals exert little control over their workload, and part-time work is often linked to informal side jobs. While most believe in their career potential, the labor market is generally regarded as insecure, with high entry barriers and insufficient job supply. Whenever participants see their ISA and working life as interrelated, they perceive the ISA as an enabling factor for better earning and career prospects.

Keywords: Sub-Saharan Africa, Income Share Agreements, Income-based Financing, Education Financing, Low-Income Countries

Education Expansion and Social Mobility: The Impacts of China's Vocational College Expansion

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The expansion of education is widely recognized as a pivotal factor in promoting social mobility; however, the effectiveness of expanding vocational education as a means to enhance social mobility remains unclear. This paper uses data from China's 2020 Population Census and the 2015 1% Population Survey to study the impact of China's unprecedented, large-scale expansion of vocational colleges in 2019 on social mobility, with a specific focus on higher education opportunities, early human capital investment, and labor migration. Our results show that the 2019 expansion significantly increased participation and enrollment in vocational colleges, especially among economically disadvantaged groups. Nonetheless, this expansion had little effect on the pursuit of academic undergraduate degrees or on improving high school attendance rates, indicating a minimal effect impact on reducing disparities in access to quality higher education. Additionally, while we find the expansion promoted intra-provincial migration, it did not lead to an increase in inter-provincial migration. In comparison, our finding shows that the 2019 vocational college expansion had a less favorable impact on social mobility than the 1999 expansion, which primarily focused on academic undergraduate education.-

Keywords: vocational education, college expansion, social mobility

Medición de la segregación educativa en Montevideo, 1960-2020

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La desigualdad educativa impone un freno al desarrollo, en particular a través de su impacto en la desigualdad de ingresos. Uruguay, si bien suele destacarse en la región como un país relativamente equitativo en términos de la distribución de los ingresos de los hogares, la alta desigualdad educativa no se condice con dicha equidad relativa. Parte de la explicación de la existencia de logros educativos diferenciados podría encontrarse en la división de grupos según su origen socioeconómico en distintas instituciones educativas. Tanto para el caso de América Latina como de Uruguay, algunos trabajos encuentran que la segregación educativa ha aumentado en los últimos años. Este trabajo, a través de una mirada de largo plazo, intenta aportar nueva evidencia sobre la evolución de la segregación educativa en la capital de Uruguay (Montevideo) desde la década de 1960 hasta el presente. En particular, se presentan diversos índices de segregación para identificar cómo se distribuyen los estudiantes pertenecientes a diferentes estratos socioeconómicos entre instituciones educativas públicas y privadas en el nivel primario de educación. El estrato socioeconómico se define en base a distintos criterios como el ingreso del hogar. Asimismo, se realiza una aproximación a la segregación residencial como factor determinante de la educativa al considerar las divisiones administrativas (barrios) en las que está clasificado el departamento de Montevideo. Los resultados preliminares dan cuenta de que la segregación no ha sido baja en el comienzo del período y además se aprecia un constante aumento de la misma. Por su parte, hay indicios de que la separación desigual de estudiantes de distinto origen entre barrios de Montevideo es un fenómeno no reciente, y además parece apreciarse cierta tendencia al aumento de la polarización.

Keywords: educación básica, segregación educativa, estratos socioeconómicos, Uruguay

Efecto de la participación de voluntarios universitarios en la escuela sobre la permanencia y la aprobación postpandemia: evidencia del programa Viva la Escuela

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El cierre de escuelas en más de 190 países por causa de la pandemia llevó a que 1600 millones de estudiantes interrumpieran su educación. Los efectos son devastadores, e impactan con mayor severidad a las poblaciones más vulnerables. Los cierres prolongados de las escuelas no solo afectaron negativamente los aprendizajes de los estudiantes, sino que aumentaron el riesgo de desertar y reprobación el año escolar. Se estima que 6% de los estudiantes en el mundo desertaron del sistema educativo a causa de la COVID-19, fenómeno que podría hacerse permanente y representa un reto en la postpandemia. Las organizaciones civiles y gobiernos han creado programas para contrarrestar estos efectos; sin embargo, poco se ha estudiado su impacto. El objetivo de este artículo es estudiar el efecto de involucrar a estudiantes universitarios voluntarios en los procesos académicos de las escuelas rurales, en un país de ingresos medios, sobre las tasas de aprobación y deserción de los estudiantes en la postpandemia. Para esto, se usan los datos administrativos del programa Viva la Escuela, un programa de alcance nacional que buscó cerrar las brechas de aprendizaje en las zonas rurales más vulnerables. Aprovechando la variación exógena derivada de la implementación por fases del programa, se usó un diseño de diferencia en diferencias para estimar el efecto causal. Los resultados sugieren que los estudiantes que recibieron apoyo de voluntarios universitarios redujeron la tasa de deserción en 1.3% y aumentaron la tasa de aprobación en 2.2% en comparación con sus pares que no participaron en el programa. Resultados robustos a diferentes especificaciones. Los resultados permiten, no solo informar sobre posibles mecanismos para reducir efectos de la interrupción del servicio educativos, sino puede dar pistas sobre cómo mejorar la educación en condiciones normales mediante un trabajo articulado entre escuelas, ministerio, universidades.

Keywords: grade retention, Dropout prevention, Differences in difference, Viva la Escuela, Volunteers participation in school

Enhancing Student Resilience Through Socio-Emotional Skills: Evidence from PISA 2022

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Student resilience—the ability of students from disadvantaged backgrounds to achieve strong academic outcomes despite socio-economic challenges—remains a critical concern in educational research and policy. While cognitive skills and academic preparedness are well-documented predictors of student success, growing evidence suggests that socio-emotional competencies also play a fundamental role in fostering resilience. This study explores the relationship between socio-emotional skills and academic resilience by analyzing data from the 2022 OECD PISA assessment. Leveraging both traditional regression models and advanced machine learning techniques, our analysis provides a comprehensive examination of the factors influencing student resilience. The findings reveal that socio-emotional skills—such as perseverance, self-efficacy, and emotional regulation—significantly contribute to academic success, particularly for students from disadvantaged backgrounds. Moreover, the integration of machine learning methods allows for a more nuanced understanding of the complex interactions between socio-economic status, school characteristics, and student outcomes. Our results confirm the expected direction and magnitude of student-level control variables, aligning with existing literature and reinforcing their robustness. At the school level, while factors such as school type and autonomy require further investigation, variables related to extracurricular activities and school climate consistently emerge as strong predictors of resilience. These insights underscore the importance of fostering socio-emotional skills as part of a holistic educational approach. By highlighting the potential of targeted interventions aimed at enhancing these skills, our study provides valuable guidance for policymakers and educators. Implementing structured programs that integrate socio-emotional learning into school curricula could serve as a powerful tool to bridge educational disparities and promote resilience among disadvantaged students. Ultimately, equipping students with these competencies may be key to fostering not only academic achievement but also long-term personal and professional success.

Keywords: Socio-Emotional Skills, Student Resilience, Multilevel Analysis, Machine Learning, Disadvantaged Students

Early Childhood Education in Sub-Saharan Africa: A Meta Analysis

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Early investments in children's human capital have been shown to help escape later educational deficiencies, especially in adverse settings. Specifically, school readiness is a proven predictor of later educational success. The period before a child enters school is a window for early childhood education and development (ECED) interventions to have maximal impact. Relevant outcomes span both social and academic domains, including literacy, numeracy, executive function, and socioemotional skills. We perform a meta-analysis of ECED policies in a context where evidence is increasing but rarely presented in a systematic fashion: Sub-Saharan Africa. We offer a novel look at the literature and evaluate what we know and what we do not know. Our analysis pulls evidence from a variety of disciplines, including economics, education, health, and psychology. However, we limit our review of the evidence only to studies that attempt to provide the causal effect of a given policy. The interventions of interest are targeted at children between the post-natal and pre-primary periods (generally ages 1 to 6, depending on the timing of primary school in each country). About half of the interventions in our analysis have a null effect, suggesting that we have a long way to go to determine what is truly effective in early childhood development and education in Africa. We use our analysis to provide both research and policy recommendations of interest to the region.

Keywords: Impact Evaluation, Sub-Saharan Africa, Early Childhood Education

Tasa y grado de absentismo: objetivo, tipos y cálculo

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El objetivo de este trabajo es presentar un indicador global de absentismo escolar que mida la incidencia del absentismo en los centros educativos durante la escolarización obligatoria. Este indicador, denominado tasa de absentismo de centro, analiza no solo el fenómeno a nivel global de etapa del centro, sino también la incidencia de los diferentes tipos de absentismo. Este indicador permite a la Administración educativa y otras entidades públicas adoptar medidas y asignar recursos para mejorar la asistencia regular del alumnado. El cálculo de la tasa se basa en tres variables: el número de faltas no justificadas (en jornadas o sesiones, según la etapa educativa), la matrícula del centro y el número de días lectivos del curso. Además, se clasifica el absentismo en tres tipos siguiendo la normativa autonómica: esporádico, intermitente y crónico. La tasa de absentismo de centro puede desglosarse como la suma de las tasas asociadas a cada tipo. Esto permite identificar casos en los que dos centros con una misma tasa global presentan distribuciones diferentes según el tipo de absentismo, lo cual es clave para diseñar intervenciones específicas. De manera complementaria, se calcula el número de alumnos absentistas y su porcentaje respecto al total de matriculados en cada etapa educativa. Estos datos ofrecen una visión más detallada del fenómeno y permiten ajustar las estrategias de intervención. Finalmente, el grado de absentismo del centro se determina a partir de su tasa, clasificándose en cuatro niveles: muy alto, alto, moderado y bajo. Esta clasificación facilita la priorización de acciones y la evaluación del impacto de las medidas implementadas. En resumen, este trabajo propone una herramienta integral para analizar, comprender y abordar el absentismo escolar, con el fin de mejorar la asistencia y garantizar el derecho a la educación de todos los alumnos.

Keywords: school inequality, Abandono escolar temprano, absenteeism, indicador

Entorno socio cultural y resiliencia en educación primaria y secundaria.

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A partir de los datos recopilados en los dos últimos ciclos de TIMSS, PIRLS y PISA, se analiza cómo influye el entorno socioeconómico y cultural en el rendimiento, tanto en matemáticas como en ciencias y lectura. Para ello se utiliza el índice de estatus social, económico y cultural (ESCS por sus siglas en inglés, ISEC en español) para PISA y el de Recursos Familiares para el Aprendizaje (HRL por sus siglas en inglés) en TIMSS y PIRLS. Se mostrará que los estudiantes de entornos más favorecidos (los situados en el cuarto más alto de ISEC o HRL) obtienen puntuaciones significativamente mayores a las de los situados en el cuarto inferior: la diferencia es casi equivalente a una desviación típica en la media de la OCDE y en la UE, algo menor en España. Adicionalmente, se estudia el porcentaje de alumnado resiliente en cada área o materia (entendidos como aquellos que, a pesar de estar situados en el cuarto inferior de ISEC o HRL, obtienen puntuaciones iguales o superiores a las del percentil 75 de rendimiento de su país o comunidad autónoma, es decir un resultado significativamente superior al esperado por su ISEC) y se analizará cómo este porcentaje ha variado entre los dos últimos ciclos, para comprobar en qué medida les ha afectado el confinamiento provocado por la pandemia de COVID.

Keywords: school inequality, home resources for learning, international evaluations

Breaking the aspirational trap: the non-linear dynamics of effort in education

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This paper examines the relationship between student aspirations, wage expectations, and academic effort, focusing on the non-linear dynamics that govern engagement in education. Using survey data from 6,079 ninth-grade students across 234 disadvantaged schools in Portugal, we provide empirical evidence supporting the theoretical framework of aspiration failure (Ray, 2006; Genicot & Ray, 2017). Our findings reveal an inverted U-shaped relationship between aspirations and effort: while moderate aspirations enhance motivation, excessively high aspirations lead to disengagement, suggesting that unattainable goals may act as a deterrent rather than a stimulus for effort. Beyond aspirations, we explore the role of wage expectations and uncover a parallel non-linear pattern. Students who anticipate higher future wages initially demonstrate increased academic effort, but effort declines beyond a threshold of approximately €3,500 for aspirations and €3,000 for expectations, indicating that both overconfidence and pessimism can reduce engagement. Heterogeneity analysis highlights notable subgroup differences. Female students report greater overall effort yet display lower willingness to engage in additional academic tasks, particularly in mathematics. Additionally, while academic performance positively correlates with effort, stronger students appear less susceptible to the demotivating effects of overly high aspirations, suggesting a moderating role of ability. These results underscore the importance of designing educational interventions that calibrate aspirations to realistic yet challenging benchmarks. Policies that incorporate role models, structured mentoring, and targeted academic support may help optimize aspirations, preventing both under-ambition and excessive goal-setting from undermining student engagement. By providing empirical evidence on the nuanced effects of aspirations and expectations, this study contributes to the broader literature on behavioral constraints in education and economic mobility.

Keywords: aspirations, inequality, individual behaviour, economic development

CHAPTER 4

HIGHER EDUCATION

CAPITULO 4

EDUCACIÓN SUPERIOR



Challenges and Opportunities for Early Career Racial and Ethnic Minority Faculty (Faculty of Color) in Higher Education

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Faculty diversity is essential for fostering inclusive excellence in higher education. However, racial and ethnic minority faculty (i.e., faculty of color) face unique challenges that hinder their professional growth and well-being. In the United States, faculty of color remain significantly underrepresented, with structural inequities in hiring, retention, and promotion processes contributing to persistent disparities. These challenges are further compounded by the disproportionate service and mentoring responsibilities placed on these faculty members, often without adequate institutional support. Key barriers include unclear tenure and promotion expectations, high teaching and service loads, and limited access to professional development and mentoring, especially from senior colleagues with shared experiences. Many faculty of color navigate additional burdens such as identity-based microaggressions, imposter syndrome, and the expectation to address institutional diversity without being provided the tools or recognition to do so effectively. These factors affect career trajectories, contribute to burnout, and hinder efforts to create equitable academic spaces. Despite these challenges, faculty of color also encounter opportunities to have a transformative impact on their institutions and students. Their experiences often enable them to connect deeply with students, serve as role models, and advocate for systemic change. Effective solutions, such as structured mentorship programs, transparent tenure processes, and robust professional development initiatives, have demonstrated promise in empowering faculty of color. Programs that foster collaboration and build supportive networks offer critical spaces for faculty to share experiences, develop strategies, and affirm their contributions. This paper explores these challenges and opportunities, offering actionable recommendations for higher education institutions to support faculty of color. By addressing structural barriers and investing in holistic, equity-driven strategies, colleges and universities can advance faculty diversity and create inclusive academic environments where all faculty members can thrive.

Keywords: inequality of opportunity, Racial and ethnic minorities, faculty, professional development, racial microaggressions

The effect of grading leniency on future academic outcomes: a machine learning approach

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This paper investigates the impact of COVID-19-induced changes in learning and assessment, particularly the cancellation of final exams, on Dutch secondary students' educational and career progression during the pandemic. Using administrative data and machine-learning techniques, it reveals that students from the COVID-19 cohort had a significantly higher probability of obtaining a secondary school leaving certificate compared to previous cohorts. Furthermore, it identifies students who succeeded in higher education during COVID-19 due to these changes, highlighting the importance of factors such as primary education performance and ethnicity in treatment effects. Subsequent analysis finds some discernible differences in post-secondary education paths among different student groups.

Keywords: machine learning, high stake tests, administrative data, higher education

Does additional education affect memory consistently? An analysis of Compulsory Schooling reforms across Europe and the U.S.

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The extent to which education enhances cognitive abilities in old age is a critical question in social science, particularly in understanding cognitive aging and Alzheimer's disease. While most supporting evidence is correlational, Banks and Mazzonna (2012) provided a groundbreaking causal estimate, showing that the UK's 1947 compulsory schooling reform led to improved memory and executive function in older males. However, external validity remains a key concern—can these findings be generalized across different reforms and contexts? A growing literature has attempted to replicate these effects using other schooling reforms. While most published studies report positive effects on memory, concerns remain about potential publication bias and methodological flexibility. Large sample size requirements often lead to underpowered studies, and researchers face numerous “degrees of freedom” in their analyses, including outcome selection, econometric specification, and subpopulation definitions. To reassess the validity of these findings, we reproduce estimates from previous studies using data from the new Compulsory Schooling Law Repository from the Gateway to Global Aging, which systematically documents schooling law changes in countries with HRS-family surveys. We aim to provide a robust reassessment of whether increased compulsory schooling consistently enhances cognitive abilities in old age by applying two statistical tests: (1) whether the reform significantly impacted cognitive outcomes and (2) whether we can reject the possibility that the effects were as large as those found by Banks and Mazzonna (2012). For each study, we compute multiple p-values across 296 analytical specifications, varying cognitive measures, econometric methods, education-based sample selection, gender groupings, and socioeconomic subpopulations. Preliminary results indicate that, across most specifications, we cannot reject the null hypothesis of no effect of compulsory schooling reforms on cognitive abilities. Similarly, most specifications fail to reject that the effects are smaller than 0.1 standard deviations).

Keywords: Compulsory education, causal effects, cognitive decline, aging, publication bias

Balancing Work and Studies: The Role of Cognitive and Non-Cognitive Skills - Evidence from a Longitudinal Study of University Students

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Background and Motivation University dropouts and delayed graduation represent significant challenges in higher education systems worldwide. Recent studies indicate that approximately 40% of students who begin tertiary education fail to complete their degree programs within the expected timeframe across OECD countries. This phenomenon coincides with an increasing trend of students participating in the labor market during their studies, raising important questions about the relationship between early work experience and academic outcomes. The interaction between work and study has garnered significant attention in the educational economics literature, with studies by Checchi (2005) and others (Baert, 2016; Geel & Backes-Gellner, 2012) highlighting how human capital accumulation decisions are influenced by both current labor market opportunities and expected future returns to education. Furthermore, research by Heckman and Kautz (2012) has demonstrated that both cognitive and non-cognitive skills play crucial roles in determining educational and labor market outcomes, suggesting potential mediating effects in the work-study relationship. This research examines these dynamics in the context of Uruguay's higher education system, where despite free public university education and open admission policies, only about 20% of enrolled students graduate. This case provides a valuable opportunity to study how early labor market participation affects academic outcomes in a context where financial barriers to entry are minimal, allowing for clearer identification of the role of skills and other factors. This raises important questions about the impact of employment on academic trajectories: do university students who do not work perform better, or are there no significant differences compared to those who work? What cognitive and non-cognitive skills are associated with the decision to work and the academic trajectories of university students?. Empirical strategy The study utilizes a unique dataset collected through two waves of surveys (2019 and 2023) of students who entered the University of the Republic's Faculty of Economic Sciences and Administration (FCEA) and Faculty of Psychology (FP) in 2018. The sample consists of 554 students who responded to both surveys. The research employs two complementary methodological approaches. First, a mediation model analyzes how working affects academic outcomes through various skills, including cognitive abilities measured by Raven's Progressive Matrices test and non-cognitive skills assessed using the Big Five Inventory (BFI-2) for personality traits and the Consideration of Future Consequences Scale (CFC). Second, the study implements a discrete choice model to examine the dynamic nature of students' decisions regarding work and study continuation, accounting for the sequential nature of

these choices and their interaction with skill development over time. This dual methodological approach allows for both the identification of mediating effects and the modeling of the dynamic decision-making process that characterizes students' educational and employment choices. The analysis examines three main academic outcomes: dropout rates, continued enrollment, and graduation by 2023, while controlling for various individual and institutional characteristics. Results The analysis reveals several significant patterns in the relationship between employment, skills, and academic outcomes. Employment demonstrates substantial associations with academic outcomes even after controlling for skills, showing negative correlations with graduation and course completion rates while positively correlating with dropout rates. The relationship between employment and personality traits, while statistically significant in some dimensions, proves relatively modest in magnitude. Both cognitive skills, as measured by Raven test scores, and personality traits assessed through the BFI demonstrate meaningful relationships with academic outcomes, suggesting their importance as mediating factors. Furthermore, the analysis found differences in outcomes between students from different faculties (FCEA and FP) and across gender lines, indicating the importance of considering institutional and demographic factors in understanding these relationships. Final comments The findings suggest that early labor market participation has meaningful implications for academic trajectories, with effects persisting even after accounting for cognitive and non-cognitive skills. The research highlights the importance of considering both types of skills in understanding academic outcomes.

Keywords: labor market, Human Capital, Higher Education, cognitive and non-cognitive skills

The Regional and Dynamic Effect of Economic Conditions on Returns to Education: Evidence from Colombia

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This paper estimates the regional and dynamic effects of economic conditions on returns to education in Colombia using panel data econometric methods. We construct a regional panel dataset from education returns across major Colombian regions and employ Ordinary Least Squares (OLS) panel estimations, Fixed Effects models, and dynamic panel estimations using Arellano-Bond and Blundell-Bond GMM methods. Additionally, we assess the impact of a structural break associated with the Covid-19 pandemic, examining two economic channels: unemployment rates and GDP per capita. Our findings indicate that the pandemic-induced decline in GDP per capita negatively affected higher education returns, while the effect of rising unemployment primarily reduced average education returns but did not significantly impact higher education returns. This resilience of higher education returns may be explained by the fact that higher education provided a protective effect against unemployment, as more educated workers were better able to adapt to remote work environments and digital labor market transformations. These results provide valuable insights for developing economies with similar economic structures and advanced regions facing comparable economic challenges.

Keywords: Returns to schooling, Context-specific effects, COVID-19 pandemic, higher education, developing countries

Inclusive Teaching: Spotting Social Isolation in the Classroom

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We evaluate an intervention aimed at addressing social isolation in classrooms. The treatment provides teachers with their students' social networks and information on developmental risks associated with social exclusion. Using friendship data and incentive-compatible measures, we find that the intervention reduces social isolation and antisocial behavior but does not increase prosocial behavior. Lower antisocial behavior enhances economic efficiency, reflected in higher average student payoffs and reduced inequality. Our findings highlight the personal and communal benefits of addressing social exclusion and antisocial peer dynamics in schools.

Keywords: Anti-social behavior, Social Isolation, Social Networks

Who benefits from Higher Education Expansion? Evidence from France

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The second half of the 20th century saw a major massification of tertiary studies in Western Europe. This paper examines the democratization effect of a higher education expansion reform in France in the 90s. I combine a newly constructed dataset on higher education institutions in France with administrative individual-level data. Applying the same matching and Two way Fixed Effects strategy to different groups, I assess the heterogeneities in the causal impact of a faculty creation on a new indicator of intergenerational social mobility. I find that women exposed to a faculty establishment in their employment area during secondary school experience a 2.5% greater increase in educational social mobility than men. Similarly, children of immigrants see a 5.9% larger gain in occupational social mobility compared to natives. Other results suggest that this expansion benefited more to individuals with low-educated parents, or residing in urban areas during their secondary school. Mechanisms are also investigated, by isolating the effects of STEM faculties, public institutions, and the extensive vs. intensive margins of expansion.

Keywords: Higher Education, Intergenerational mobility, Human capital

De-Efficiency of Italian Universities: A Comparative Analysis of Public, Private, and Telematics Institutions

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Gaetano Francesco Coppeta

Traditionally, Italian universities operated as public entities managed within the state. However, the Higher Education (HE) sector has significantly transformed in recent decades. A series of reforms have introduced market-oriented mechanisms and competition into the public sector, encouraging universities to compete for funding, attract more students, and enhance research output to secure more research grants. Alongside transforming the public sector, a new and less explored element has emerged in the HE landscapes: the coexistence of different institutions offering the same "products": education and research. Italy represents an interesting case in this respect. In addition to the traditional public universities, several private and online learning universities have emerged. The latter, known in Italy as 'telematics' has experienced remarkable growth, with an increase in student numbers of 180 thousand units from 2011/12 to 2021/22, and has become a significant part of the Italian HE system. The picture for the academic year 2021/22 sees 1.6 million students enrolled at state universities (82.2%), 123 thousand enrolled at non-state universities (6.3%), and 224 thousand enrolled at telematic universities (11.5 percent), up from 2.5% in 2011/12. The literature has only begun to explore online universities and their organizational dynamics. Several studies show that institutions offering online courses tend to charge lower tuition fees, raising the possibility that online learning might be a technological advancement capable of "bending the cost curve" in HE. However, this comes with concerns that the quality of education may need to improve when more content is delivered online. This paper explores this phenomenon within the Italian context, where online learning has grown substantially. We analyze the efficiency of the institutions using a GTRE Stochastic Frontier approach. Results show that online universities exhibit greater efficiency when we look at teaching efficiency, but the inclusion of research output results in a drop in the efficiency scores. Furthermore, this paper emphasizes the importance of quality, arguing that cost reduction does not necessarily equate to technological advancements or improved productivity but may instead lead to a decline in quality.

Keywords: Italy, Efficiency, Higher Education, online learning

Decentralized Funding and Its Impact on Spanish Public Universities: Evidence from a 2002–2022 Panel Study

Alejandro Briso de Montiano

Despite the fact that the autonomous regions finance 70% of the expenditure of the Spanish Public Universities System (SUPE), this funding has been scarcely analyzed in the specialized literature. This study focuses on regional public funding allocated to the SUPE and has three objectives: to analyze the determinants influencing funding decisions; to explain interregional inequalities in funding levels; and to quantify the effects of the autonomous funding system on the provision of public university services. To this end, a panel database covering the years 2002 to 2022 has been created. Economic, demographic, political, structural factors of the SUPE, and public sector financial variables are considered as explanatory determinants of public spending per student. Preliminary results suggest that the autonomous funding system influences university financing in both foral jurisdictions and autonomous regions under a common regime. After estimating the determinants with a static model, a dynamic model is used to assess how previous budgets influence subsequent ones. This work differs from previous approaches—primarily rooted in political science—by adopting an economic perspective. It contributes to international debates on equity in educational financing, especially within decentralized systems, and provides empirical evidence on how the autonomous funding model impacts the provision of public services.

Keywords: Higher education policy, Higher education funding, regional financing system, panel data analysis

High-achieving peers and student performance in selective and non-selective university programs: Evidence from Italy

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Andrea Lopes (University of Milan)

This paper studies the effects of being exposed to high-achieving (HA) peers on several university students' outcomes. Taking advantage of an administrative dataset covering the whole population of undergraduate students enrolled in Italian universities in 2010--2019, we exploit quasi-random variation across student cohorts to estimate the impact of HA peers — identified according to the final high school grade — on student outcomes. The analysis leverages different types of admissions across university programs within the Italian university system to explore how peer group effects vary in selective and non-selective academic contexts.

Keywords: Peer Effects, higher education, Gender

Research Focus and Up-or-Out Promotion Pressure Among Pre-Tenure Faculty: Empirical Evidence from China

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Shiyue Cui (Beihang University)

Wenjuan Gao (Beihang University)

Background: The “non-tenure or leave” policy in higher education has intensified promotion pressure on early-career faculty, often prompting them to pursue rapid, short-term publications at the expense of sustained, in-depth research. This paper examines the relationship between such promotion pressure and research focus among pre-tenure faculty at Chinese research universities, addressing a notable gap in empirical studies. **Methods:** Data were obtained from 3003 full-time faculty at a Chinese Double First-Class university, with demographic information and publication records (2010–2023) collected via web crawlers. The paper introduces an innovative measure of research focus using Topic2Vec—a natural language processing technique applied to paper abstracts for topic modeling. Latent topic distributions, combined with semantic embeddings, are used to generate quantifiable topic vectors, while cosine similarity measures the thematic consistency across a researcher’s publications. Promotion pressure is quantified along two dimensions: threshold pressure, reflecting the urgency to meet evaluation criteria through representative accomplishments and remaining time, and competition pressure, based on the number of competitors, their research performance, and the proximity to evaluation deadlines. **Results:** The analysis reveals a gradual decline in research focus over the first ten years post-entry, with pre-tenure faculty exhibiting a more pronounced decrease—especially during the 3–4 and 7–8 year intervals. Both threshold and competition pressures are significantly negatively associated with research focus (p

Keywords: tenure track, research focus, promotion pressure, faculty productivity

The Value of Dual Education: Evidence from the Apprenticeship Reform in Italy

Simona Lorena Comi (University of Milano - Bicocca)

Limited evidence exists regarding the effectiveness of dual education systems. This paper addresses this gap by investigating the impact of Italy's Level I Apprenticeship reform, which integrates apprenticeships into the school curriculum, thereby establishing Italy's first comprehensive dual education model. Exploiting the staggered regional implementation of the reform, I apply multiple quasi-experimental techniques, including inverse probability weighted regression adjustment (IPWRA) and event study methods, to estimate the reform's causal effects on labor market outcomes. The findings reveal a significant positive impact on employment probability and earnings, with considerable variation across demographic groups and firm characteristics. Specifically, dual education returns are more substantial for females and minors. Additionally, the reform has increased transitions to Level II apprenticeships and the probability of having an open-ended contract.

Keywords: Vocational Education and Training, Dual education, Apprenticeship, Returns to Education

Teachers and Students Expectations on Pursuing Higher Education

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Cátia Batista (Nova SBE)

Individuals with higher education degrees earn proportionally more in the future, yet students from socioeconomically disadvantaged backgrounds tend to struggle more to reach it. Prior literature points out factors such as parental education, and external expectations, such as parents and peers in shaping the educational path. Teachers' expectations, acting as self-fulfilling prophecies, are another crucial yet underexplored factor. This study explores the impact of student characteristics on both teacher and student expectations for university completion, while controlling for students' demonstrated ability. Using a novel dataset of 5,689 ninth grade disadvantaged socioeconomically students in Portugal and their teachers, we find a substantial gap between expectations: while 82% of students aim to complete higher education, only 54% of teachers expect them to do so. Our analysis reveals that students' characteristics significantly influence both teachers' and students' expectations, generally aligning in direction but differing in magnitude - with a stronger impact on students' expectations. However, a notable exception is foreign-born students, for whom teachers hold lower expectations despite the students' own higher expectations, showing a teacher-student gap of 15.3 percentage points. These negative projections are particularly pronounced among older and more experienced teachers. Female and more engaged students exhibit higher expectations from both teachers and students, with students' expectations exceeding teachers by 5.5 and 21.6 percentage points, respectively. These findings suggest the presence of implicit biases in shaping educational expectations, especially towards immigrant students. Research has shown that students from minority groups benefit more from positive teacher expectations, highlighting the potential effectiveness of policies targeting these groups. This study lays the groundwork for understanding unconscious bias in both teachers' and students' expectations regarding university completion.

Keywords: Discrimination, Teachers, educational attainment, Expectations

College choices in a repeated DA setting: empirical evidence

Dejan Kovac (Harvard Kennedy School)

Christopher Neilson (NYU)

Johanna Raith

A growing literature shows that strategy-proofness of school choice mechanisms does not translate into practice. Applicants in a DA mechanism consider their beliefs on admission probability in their choices. In this study, we use a unique dataset from the centralized college admission system in Croatia for five cohorts to provide evidence for strategic application behavior in Deferred Acceptance (DA) mechanisms. We track the hourly application choices of more than 30,000 individuals per cohort over the course of a week in an application system that updates and publishes preliminary admission outcomes on an hourly basis. We show that applicants react to the information signals on admission probability exploiting fluctuations of programs' hourly admission cutoff in an RDD setting. Applicants are more likely to adjust their application choices when they are right below the cutoff i.e. when they are temporarily not admitted to a particular college program than when they are just above the cutoff and receive a positive preliminary admission signal. This indicates that beliefs on admission probability feed into application choices. Next, we determine strategic types and identify how application strategies change over the application period. We find that over the application period, applicants most at risk of not being admitted to any program reduce this risk by adding safety options. The information signal seems to encourage a reconsideration of application choices and leads to improvements for the most-at-risk applicants. Last, we provide evidence of strategic application choices being more common in a real world setting than in experiments. To our knowledge, this is the first study to exploit within-individual changes in admission probability and application choices to quantify strategic behavior for the full universe of applicants in a repeated DA college admission system.

Keywords: Higher Education, school choice, Application behavior, dynamic DA

The public university systems of the Community of Madrid (Spain) and the Lazio Region (Italy): a prospective and comparative analysis of the demographic and economic context

Carlo Stella (Universidad Autónoma de Madrid)

Carmen Pérez-Esparrells (Universidad Autónoma de Madrid)

Julio del Corral Cuervo (Universidad de Castilla-La Mancha)

In this work, firstly, a comparison is made of the most important financial indicators for the university systems of the regions where the capitals of Spain and Italy are located due to their similarities in size and number of universities: the university system of the Community of Madrid and that of the Lazio Region. In addition, secondly, the behavior of demographics is studied with the aim of demonstrating the future evolution of potential students in HEIs up to the year 2040 and highlighting the need to take urgent measures to maintain the level of students in HEIs in both regions, on the one hand, and to propose structural responses, on the other. It concludes by formulating, on the basis of the results found for these two regions, various recommendations for public higher education policies aimed at mitigating the possible consequences of the financial and demographic reality of the future in order to support the financial sustainability and strengthening of HEIs in the European countries analyzed, which can be extended to other countries in our environment.

Keywords: efficiency, Regional university systems, educational policies, demographics, public spending on higher education

At the forefront of universities' activity paradigm change: delving into research and third mission linkage in UK universities

Anna Rita Dipierro (University of Calabria)

Pierluigi Toma (University of Salento)

The assumption that universities only produce graduates is somewhat simplistic. Over the years, they have enlarged substantially their scope covering the teaching, research and third mission dimensions. This work assesses the efficiency through which universities pursue objectives along the research and third mission directions. Specifically, we combine a nonparametric efficiency technique, a difference-in-difference approach with the nonparametric genetic matching technique, and analyses of distributions. We inquire about the linkage between research and the third mission, by testing the role of the European Framework programs, and the diverse nature of universities. The analysis is carried out for a sample of universities over the 2014-2020 in the United Kingdom (UK), whose higher educational system is well-known and highly-respected. UK universities are herein explored in the way they pursue research and third mission efficiency, which is found to be dependent on their age and membership to elite-group of universities. To do so, we revise the main policy reforms, and we rely on the relevant literature on the research-third mission bond. Offering up-to-date evidence on the research-third mission association in the UK scenario, we suggest ways to strengthen and measure it both in academic and practitioners' spheres.

Keywords: Universities, UK, Nonparametric Efficiency, Machine learning

Assessing the Value of Incomplete University Degrees: Experimental Evidence from HR Recruiters

Andrea Diem (Swiss Coordination Center for Research in Education)

Christian Gschwendt (University of Bern)

Stefan C (Wolter . University of Bern)

A university degree is a risky investment because of the non-negligible risk of having to drop out of university without graduating. However, the costs of this risk are controversial, as it is often argued that even an uncertified year of study has a value in the labor market. To determine this value causally, however, alternatives to studying must also be considered, which is done here with the help of a discrete choice experiment with a representative sample of over 2,500 HR recruiters. The result is that dropping out of university with a major closely related to an advertised job leads to similar labor market outcomes as if someone had not studied at all. Without a direct link to a job, however, dropping out of university significantly reduces lifetime earnings. Furthermore, HR recruiters clearly prefer applicants who have used the years without studying for human capital accumulation in an alternative way, for example in the form of a traineeship.

Keywords: hiring decisions, Dropouts, discrete choice experiment, sheepskin effect, willingness to pay

CHAPTER 5

EDUCATIONAL EVALUATION

CAPITULO 5

EVALUACIÓN EDUCATIVA



Eficiencia de la enseñanza técnica y tecnológica en Colombia

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Rafael Antonio Viana Barceló (Universidad Industrial de Santander)

Con el objetivo de analizar la eficiencia de la enseñanza técnica y tecnológica de las instituciones públicas y privadas en Colombia, se utiliza información contenida en las bases de datos Saber TyT[1] del periodo 2020-2023 y la Saber 11 del periodo 2012-2020, elaborada por el Instituto Colombiano para la Evaluación de la Educación (Icfes). Para la estimación de la eficiencia se utilizaron como variables productos: el puntaje promedio obtenido por los estudiantes matriculados en las instituciones públicas y privadas por programa académico en los componentes de lectura crítica y razonamiento cuantitativo. De igual forma, como variables insumos se utilizaron: el nivel socioeconómico medio y el promedio obtenido por los estudiantes en los componentes de lectura crítica y razonamiento cuantitativo en la Prueba Saber 11. La estimación de la eficiencia se realizó por medio del método de fronteras no paramétricas robustas, de orden- α planteado por Daouia y Simar (2007). Los resultados estimados permiten identificar que Instituciones públicas son en promedio más eficientes que las privadas. [1] De acuerdo con el ICFES, Saber TyT, es un instrumento de evaluación estandarizada para la medición externa de la calidad de la educación superior que evalúa las competencias de los estudiantes en dos componentes. El primer conjunto evalúa cinco módulos genéricos: Lectura Crítica, Razonamiento Cuantitativo, Competencias Ciudadanas, Comunicación Escrita e Inglés. El segundo grupo está compuesto por tres módulos asociados a temáticas y contenidos específicos que los estudiantes pueden presentar de acuerdo con su área de formación.

Keywords: Efficiency, higher education, programa academicos

Estimating Causal Effects of School Financial Education by Non-experimental Evaluation Methods: Evidence for Italy from PISA Data

Manuel Salas-Velasco (Universidad de Granada)

This conference paper examines the causal impact of mandatory financial education on financial literacy outcomes among Italian secondary school students. In response to the ongoing debate about the inclusion of financial education in high school curricula, we analyze whether such education in a compulsory upper-secondary curriculum positively affects financial literacy outcomes. Using observational data from Italy's PISA 2012 financial literacy assessment, we apply propensity score (PS) matching methods and weighting methods to control for confounding factors. The sample comprises 360 exposed students with complete data on relevant covariates (treated subjects). Our results indicate that students exposed to mandatory financial education score, on average, 479 points in financial literacy, compared to 466 points for the overall population of 15-year-olds. This suggests a 13-point advantage for students receiving financial education. Propensity score methods are employed to mitigate selection bias in non-experimental settings, with the PS matching and weighting yielding consistent results. The results highlight the policy relevance of mandatory financial literacy courses and suggest positive outcomes for students' financial knowledge and skills.

Keywords: Propensity Score Matching, Italy, Financial literacy, Financial education, PISA

Las evaluaciones educativas internacionales y su análisis del uso de las tecnologías en el aula y en el hogar

Luis Pires (Universidad Rey Juan Carlos)

María-Jesús Gallego-Losada (Universidad Rey Juan Carlos)

En este artículo se analizan las diferentes relaciones que se pueden establecer entre los resultados académicos y el uso de la tecnología, tanto el uso en el aula como el uso personal que hacen los estudiantes o sus actitudes ante las nuevas tecnologías, a partir de los resultados que obtienen las principales evaluaciones educativas internacionales de la IEA (PIRLS, TIMSS, ICILS) y de la OCDE (PISA). El análisis permitirá establecer las relaciones generales entre ambos elementos, así como la situación del sistema educativo español en relación con el resto de los sistemas educativos en el mundo. Para ello se estudian, en primer lugar, los resultados en las pruebas PIRLS y TIMSS en alumnos de 4º de educación primaria. Seguidamente se analiza la prueba ICILS, especializada en la evaluación de la competencia digital de los estudiantes de 2º de ESO. A continuación, se repasan los estudios académicos que analizan el impacto de la tecnología y los recursos digitales en el rendimiento educativo. Un último apartado ofrece las principales conclusiones.

Keywords: TIMSS, Technology in Education, International Assessments, PIRLS, PISA

The impact of academisation in English schools on the England-Wales PISA achievement gap

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Javier Valbuena (Universidad de Zaragoza)

Yu Zhu (University of Dundee School of Business)

We use the Programme for International Student Assessment (PISA) database to examine the effect of an increase in school autonomy in England through the expansion of academies (publicly funded independent schools) in their education system over the past two decades, on student achievements. The 2006, 2009, 2012 and 2015 editions of PISA contain school-level information regarding decision making (whether the education authority or the school itself) as well as information on school ownership distinguishing between public schools, private government-dependent schools and private independent schools. The large UK sample across PISA editions allows us to compare England and Wales's results. England scores higher than Wales in all three competences tested in PISA (reading, mathematics and science) and this gap has widened over time. Moreover, we document a significant increase in the number of private government-dependent schools (academies) and a reduction in the number of public schools in England, while the distribution of schools by ownership has not changed in Wales. This indicates that England has more school autonomy than Wales and this has increased in recent years. Difference-in-differences estimators show a positive and significant effect of increased school autonomy in England on student performance in science.

Keywords: school autonomy, academies, PISA, diff-in-diff

Towards Evidence-Based School Accountability in Sweden

Axel Norgren

Abstract: School accountability is a common feature of many educational systems, despite this, there is scarce evidence on the inspectorate model of school accountability. This article evaluates the effects of Swedish school inspections on pupils' achievement using a double-robust difference-in-difference model. The study is the first to examine the effects of a school inspection visit on educational outcomes over a longer time horizon (6-year period). The results show overall negligible effects of inspection although there is an indication of heterogeneity in effects over time. Thus, temporal dynamics should be considered in future research as well as in policymaking when it comes to school accountability.

Keywords: difference-in-differences, School Accountability, School Inspection

Which teaching practices increase students' performance?

Evidence from France

Claire Morrier (LEM UMR 9221)

Teachers play a crucial role in shaping students' performance. However, the specific characteristics that define an effective teacher remain uncertain, and the impact of teaching practices on student achievement is still debated in the literature. This paper exploits data from the TIMSS 2019 survey for 4th-grade French students, taking advantage of the fact that in primary school, French students have a single teacher for both math and science. Using a within-student, within-teacher identification strategy, I assess the effect of teaching practices on students' test scores. Specifically, increasing the use of cognitive activation techniques by one standard deviation increases student test scores by 1.5% of a standard deviation. Increasing the frequency of homework and using assessment strategies that promote higher order skills also have a positive and significant impact on test score. On the opposite, traditional teaching strategies do not affect the cognitive skills of students. These findings are robust to controls for students' and classrooms' perceptions of teacher quality. Further investigations show that results are partly driven by the effect of cognitive activation on non-cognitive skills, such as confidence and interest in the subject. This paper contributes to the literature in several ways. First it provides a novel estimation strategy that controls for teachers unobserved characteristics that could bias the results. Second, it adds to the debate on modern and traditional practices by using data from the French context. Finally, it shows that teaching practices do not only matter for cognitive skills but also for non-cognitive skills and that there are no trade-off between the two.

Keywords: teaching strategies, TIMSS, teacher quality

How does ICT affect school efficiency? Evidence from OECD PISA 2022

Mara Soncin (Politecnico di Milano)

Tommaso Agasisti (Politecnico di Milano (Italy))

The efficiency of educational institutions has gained significant attention, emphasizing effective resource allocation to improve outcomes. The integration of digital technologies, accelerated by COVID-19, has amplified interest in the role of ICT in school efficiency, though this remains underexplored. Regional studies reveal differences: in Latin America, access to digital tools affects efficiency more than their use, while in Europe, ICT use outweighs availability in influencing outcomes. Europe offers a unique context due to its structural similarities and diverse educational policies. This study examines the relationship between ICT use and school efficiency across 22 European countries, addressing: (1) How do school efficiency levels vary across the EU? (2) How are ICT availability and use linked to efficiency? Using data from the OECD Programme for International Student Assessment (PISA) 2022, the study analyzes cognitive and non-cognitive outcomes, school resources, and ICT usage patterns. A two-stage approach is employed: first, a robust Data Envelopment Analysis (DEA) model assesses efficiency at global and country-specific levels, accounting for structural differences and outliers. Second, multilevel random forest models explore links between efficiency and ICT use, controlling for school, student, and contextual factors. Results show an average global efficiency score of 0.87, with schools performing closer to country-specific frontiers (0.90). ICT use, particularly activities fostering student autonomy like researching real-world problems, positively correlates with efficiency, while moderate use of digital learning games also supports it. Findings highlight the need to prioritize ICT-supported educational activities over increasing ICT resources, offering insights for policymakers and advancing research on technology's role in school efficiency.

Keywords: Schools' efficiency, ICT, PISA

The use of ICT in the classroom and student achievement: Evidence from PIRLS 2021 using machine learning techniques

José Manuel Cordero Ferrera (Universidad de Extremadura)

Víctor Javier España Roch (Universidad Miguel Hernández)

Lucía Mateos Romero (Universidad de Extremadura)

The study of the influence of information and communication technologies (ICT) on educational achievements has gained increasing attention from both policymakers and researchers. Most countries have made huge public investments in purchasing and maintaining ICT-related educational devices. This paper focuses on analyzing how teachers use these devices in their classes. For this purpose, we exploit the information provided by PIRLS 2021 on the frequency with which teachers employ these resources in their classes using different machine learning techniques. Recent developments in machine learning have expanded the focus from pure prediction to providing valuable explanatory insights. By leveraging these approaches, we seek to uncover causal relationships and investigate potential heterogeneous effects among distinct groups within our sample. Our methodological framework centers on tree-based models, such as Classification and Regression Trees (CART), Random Forests, and Gradient Boosting (GBoost), which enable the discovery of complex, nonlinear patterns in the data.

Keywords: machine learning, Keywords: ICTs, Educational policy, Educational achievement

Effects of educational governance on learning outcome

Chia Nian Lee

Numerous scholarly articles have explored the potential benefits and challenges of expanding public private partnership (PPP) in public service sectors especially health care, elders' care services and education. The governing of PPP in education deserves close scrutiny to secure the public interest while adapting the vitality of private sector. By using data from PISA 2018, Taiwan Education Panel Survey (TEPS) and Taiwan Education Panel Survey Beyond (TEPS-B), this study intends to compare the effects of educational governance and funding between public school and private school on students' learning outcomes and educational segregation, taking Taiwan as a sample country before extending to others. Studies shows that school types and admission policies have significant effects on student's learning outcome and level of educational segregation. This study provides significant insight on research on school types, educational governance, educational funding policy and public administration.

Keywords: effectiveness, Efficiency, grade inflation, private premium

How to access ICT in education: a conceptual framework

Giulia Vaiani (Politecnico di Milano)

Mara Soncin (Politecnico di Milano)

Tommaso Agasisti (Politecnico di Milano (Italy))

The integration of information and communication technologies (ICT) in higher education institutions (HEIs) has become increasingly relevant, influencing teaching methodologies, accessibility, and institutional strategies. Although numerous research studies have highlighted the benefits of ICT adoption in higher education institutions, from improving student engagement to enhancing learning outcomes, a structured approach is needed to analyze the extent and manner in which ICT is being used. This paper presents a comprehensive framework designed to investigate the use of ICT in higher education, which includes three key dimensions: ICT usage model, which examines the ways in which digital technologies are integrated into academic activities; accessibility and availability, which assesses infrastructural challenges and the digital divide; and teacher training and support, which assesses the ways in which educators are trained and institutionally supported to adopt ICT. These dimensions operate in the broader context of policies and strategies, which define universities' governance, regulations, and digital transformation strategies. By providing a structured methodology for analyzing ICT implementation, this framework serves as a valuable tool for policymakers, university administrators, and researchers seeking to improve digital education strategies. Its application can support evidence-based decision-making, ensuring that ICT investments align with institutional goals and contribute to a more effective, inclusive, and sustainable higher education system.

Keywords: ICT, digitalization, Framework

The Challenge of School Efficiency: A Comparative Analysis of Public and Private schools in Italy with a focus on Socio-emotional skills

Giovanni Antonini (Politecnico di Milano)

Tommaso Agasisti (Politecnico di Milano (Italy))

The efficiency of school systems is a critical issue in educational economics, particularly when comparing public and private institutions. Efficiency, defined as the ability to maximize outcomes given available resources, is a key factor in evaluating educational performance. While prior research suggests that private schools tend to be more efficient due to market-driven incentives, the Italian context presents a fragmented scenario with regional disparities and a lack of empirical evidence on the role of socio-emotional skills (SES) in school efficiency. This study assesses the efficiency of Italian public and private schools using OECD-PISA data from 2015, 2018, and 2022. We employ Data Envelopment Analysis (DEA) to measure efficiency, considering five key inputs: socioeconomic status (ESCS), teacher-student ratio, certified teacher proportion, educational resources, and digital infrastructure. To extend the efficiency framework, we integrate SES variables as both inputs and outputs, analyzing their impact on school performance. The eight SES dimensions examined are assertiveness, cooperation, curiosity, emotional control, empathy, perseverance, stress resistance, and creative thinking self-efficacy. Preliminary results confirm that private schools outperform public schools in efficiency, aligning with economic theory. Additionally, regional differences persist, with northern Italian schools achieving higher efficiency than those in central and southern regions. The inclusion of SES as an output widens the efficiency gap between public and private schools, suggesting that SES development is a stronger driver of efficiency in private institutions. This research contributes to the economic analysis of school efficiency by incorporating SES, offering policy insights on improving both cognitive and non-cognitive educational outcomes in Italy.

Keywords: Schools' efficiency, school choice, Socio-Emotional Skills

Do stop (just) believing. The influence of financial knowledge, financial attitude and financial behaviour on the perception of retirement preparedness

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Luis Pires (Universidad Rey Juan Carlos)

Antonio Montero Navarro (Universidad Rey Juan Carlos)

Lydia Murillo Ramos (Universidad Rey Juan Carlos)

This article examines the state of financial literacy among Spanish adults, drawing on data from the Bank of Spain's Financial Competence Survey (ECF). The ECF assesses understanding of fundamental financial concepts such as inflation, compound interest, and risk diversification. Findings from the latest survey indicate that only 19% of respondents correctly answered all three basic financial questions, highlighting significant gaps in financial knowledge. The analysis explores demographic variations in financial competence and discusses the implications for financial education policies in Spain.

Keywords: Financial literacy, Financial Competence Survey, Economic education, Household finance

From Admission to Dropout: An Empirical Study in Higher Education Based on Tinto's Model

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Maria Eugenia Cardenal de la Nuez (Universidad de Las Palmas de Gran Canaria)

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University dropout is a central concern in higher education due to its personal and social implications. Vincent Tinto's model suggests that dropout is a sequential process influenced by multiple factors, highlighting the importance of academic and social integration. However, much of the literature has focused on the direct effects of pre-entry attributes, neglecting their indirect impacts mediated through other variables. This study examines how university entry conditions influence the likelihood of first-year dropout by differentiating direct and indirect effects. A structural equation model (SEM) is applied to evaluate how these conditions affect academic integration and ultimately the decision to remain or leave. We utilized administrative census data of students who entered undergraduate studies at the University of Las Palmas de Gran Canaria (ULPGC) during the academic years 2017/2018 and 2018/2019, followed over two years. Variables considered include family background, individual attributes, pre-college education, and academic performance. SEM methodology captures key mediating effects in the transition to university. Findings reveal that most pre-entry attributes exert an indirect influence on dropout decisions, mediated by academic performance. Specifically, accessing university through vocational training indirectly increases the likelihood of dropout across various fields of study, while being female, coming from medium-low socioeconomic backgrounds, or having higher than passing entrance grades indirectly reduces this likelihood. The study concludes that academic integration, represented by academic performance, plays a critical role in moderating—and in certain cases fully mediating—the impact of pre-entry attributes on university persistence.

Keywords: Dropout, Higher Education, SEM, Tinto's model, Indirect effects

The Impact of AI-Supported Learning on Financial Literacy: Evidence from a Randomized Controlled Trial

*Jaime Polanco-Jimenez (Leuven Economics of Education Research, KU Leuven,
Belgium; Department of Economics at Pontificia Universidad Javeriana, Colombia)*

De Witte Kristof (KU Leuven)

We conduct a randomized controlled trial (RCT) to assess the impact of AI on financial literacy among Belgian secondary students. Students were randomly assigned to traditional instruction (control), AI-supplemented traditional materials, or a tailored AI chatbot. Preliminary results show that the tailored AI chatbot leads to as good as the traditional teaching methods in financial literacy scores, with a sustained effect two months after the learning. With an effect is stronger for students with lower pre-existing financial literacy. Our findings suggest AI offers a promising solution for addressing challenges in education, such as the need for personalized instruction and effective knowledge transfer, as demonstrated in the context of financial literacy.

Keywords: Financial Literacy, Randomized Controlled Trial, Adaptive Learning, Personalized Learning

CHAPTER 6

EDUCATION AND LABOR MARKET

CAPITULO 6

EDUCACIÓN Y MERCADO LABORAL

Three white lines of varying lengths and slopes are positioned in the bottom right corner of the page, creating a modern, abstract design element.

The Heterogenous Treatment Effects of Compulsory Education Age Reforms - A Causal Forest Approach

Hannelore Nelissen (KU Leuven)

De Witte Kristof (KU Leuven)

While existing literature often focuses on average treatment effects, there is limited understanding of how uniform policy measures, such as raising the compulsory education age, impact very specific subgroups of students. This paper addresses this gap by investigating the heterogeneous effects of a compulsory education age reform on school dropout rates. Using rich administrative microdata from Statistics Netherlands, we apply a causal forest model to estimate Conditional Average Treatment Effects (CATEs), revealing how policy impacts vary across individual and school characteristics. Our results show an average reduction of 1.06 percentage points in dropout rates attributable to the reform, with significant heterogeneity; approximately 29% of the estimated CATEs indicate statistically significant effects up to 4.7 percentage points. Vocational track students emerge as the most responsive group, with parental income, household composition, and school progress further influencing outcomes. Moreover, we find that only certain groups of at-risk students are most suitable targets for the policy reform, suggesting that a single policy may not address the needs of all students. The analysis advocates the need for complementary policies to better address diverse student needs. This study contributes to the literature by demonstrating the importance of nuanced, data-driven policy targeting to optimize educational outcomes across varied contexts.

Keywords: Dropout prevention, Compulsory education, casual forest

Do Grow-Your-Own Programs Work? Evidence from the Teacher Academy of Maryland C23

David Blazar (University of Maryland)

Wenjing Gao (University of Maryland)

Seth Gershenson (American University)

Ramon Goings (University of Maryland Baltimore County)

Francisco Lagos (Inter-American Development Bank)

Local teacher recruitment through “grow-your-own” programs is a prominent strategy to address workforce shortages and ensure that incoming teachers resemble, understand, and have strong connections to their communities. We exploit the staggered rollout of the Teacher Academy of Maryland career and technical education certificate program across public high schools, finding that exposed students were more likely to become teachers by 0.6 percentage points (pp), or 47%. Effects are concentrated among White girls (1.4pp/39%) and Black girls (0.7pp/80%). We also identify positive impacts on wages (5% on average/18% for Black girls), countering a prevailing narrative that teaching leaves one worse off financially relative to other labor market opportunities.

Keywords: Earnings, teaching, High School Curricula, College Major Choice, Occupational Choice

Environmental Awareness and Occupational Choices of Adolescents

Patrick Lehnert (University of Zurich)

Harald Pfeifer (Federal Institute of Vocational Education and Training)

This paper analyzes the impact of environmental awareness on the occupational choices of adolescents. To do so, we exploit the apprenticeship system in Switzerland, where about two-thirds of adolescents choose an apprenticeship in their preferred occupation at around age 15. We consider two dimensions of environmental awareness as potential drivers of their occupational choice. First, we consider time-persistent regional social norms, which we proxy by regional differences in popular votes on environmental issues. Second, we investigate short-term shocks in environmental awareness, which we proxy by the occurrence of Fridays for Future strikes in different locations at different points in time. To measure whether adolescents choose occupations that have the potential to serve environmental protection, we estimate an occupational greenness score based on Swiss job-ad texts as data. Combining this occupational greenness score with detailed process-generated data on adolescents' applications from Yousty, Switzerland's largest online job board for apprenticeship positions, we find that environmental awareness is positively related to the greenness of adolescents' occupational choices. However, this finding applies only to short-term shocks in environmental awareness and not to time-persistent pro-environmental norms. We interpret this result as evidence for a social-movement effect on norms and values that significantly alter adolescents' occupational choices.

Keywords: occupational choice, apprenticeship, vocational education and training, climate strikes, social norms

Unemployment shocks and children's time allocation: evidence for Brazil

Lorena Vieira Costa (Universidade Federal de Viçosa)

Iván Vicente Carrión (University of Valencia)

This paper examines the impact of local labor market conditions on children's time allocation in urban metropolitan Brazil from 2016 to 2019. Children's time spent on leisure, schooling, studying, and working significantly affects their development and future prospects. The opportunity cost of working detracts from beneficial activities like schooling and play, crucial for human capital accumulation. Children's time allocation is a household decision influenced by various economic and non-economic factors. This study focuses on local labor market conditions, investigating whether children's performance and hours in different work activities and school attendance are affected by local labor market shocks. This school attendance, and the related academic performance, could have implications in terms of equality of opportunities. Despite a historical decline, child labor has persisted, with global rates stagnating at 9.6% from 2016 to 2020. In Brazil, child labor rates were 5.2% in 2016 and 4.9% in 2022. The COVID-19 pandemic and economic shocks have exacerbated this issue, necessitating further research on household decisions regarding children's time allocation. Using data from the Pesquisa Nacional por Amostra de Domicílios Contínua (PNAD) from 2016 to 2019, we analyze children aged 5 to 17. Our empirical strategy, based on the conditional exogeneity of shock measures, provides robust insights. By examining the determinants of child labor, we aim to inform policy debates on mitigating harmful decisions regarding children's capital, and human capital, accumulation in the face of economic shocks. Moreover, we analyse the potential heterogeneity of this time allocation mainly by gender and socioeconomic status of origin with the idea of finding the most effective public policies.

Keywords: Human capital, Child labor, Time allocation, School attendance

The effect of education on the income gap between natives and immigrants in Spain.

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Since 2016, Spain has become the second country in the European Union that receives the most immigration annually. Nearly 40% of these immigrants are between 20 and 35 years old, so, in addition to their sociocultural integration, Spanish society faces the challenge of helping immigrants integrate into the labor market. On one hand, a key indicator of labor integration is the income gap between natives and immigrants. On the other hand, one of the main factors that influences individual income is the highest level of education achieved. Therefore, this study analyzes how the income gap between natives and first-generation immigrants varies according to their educational level. For this analysis, immigrants are divided into two groups: those from the European Union and those from non-EU countries. The data used comes from the Living Conditions Surveys of 2019 and 2023 conducted by the National Statistics Institute (INE), and the methodology employed is based on the approach initially proposed by Oaxaca and Blinder, which allows for the calculation of the income gap and its subsequent decomposition. The results show that the higher the educational level of individuals, the greater the income gap between natives and immigrants with the same level of education. These findings are novel, as no similar study currently exists for the Spanish case.

Keywords: Immigration, income gap, education, Spain

The Impact of Tuition Fee Increases on Graduate Outcomes: Evidence from English and Scottish Higher Education Institutions

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Leveraging the policy divergence between higher education institutions (HEIs) in England and Scotland, we use a quasi-experimental design to examine the impact of the 2012 undergraduate tuition fee cap increase for English home students only on graduate outcomes. Utilising individual-level data retrieved from the Higher Education Statistics Agency (HESA) for 114 Universities UK (UUK) affiliated institutions, we employ difference-in-differences (DID) with two-way fixed effects (TWFE), triple difference (DDD) and quantile regression approaches. Our empirical analysis reveals positive policy effects on graduate earnings, with average treatment effects of 2.1% and 1.6% for male and female graduates. The policy impacts exhibit substantial heterogeneity across the graduate earnings distribution in the full sample and within subgroups identified by subject category, demographics, and widening participation indicators. While individuals of comparatively less advantaged backgrounds also show gains, these policy benefits are concentrated mainly among the high performers within the subgroups. At the institution-subject level, we find particularly strong effects in high-return disciplines at prestigious institutions and in programmes offering integrated job-relevant training. Our findings suggest that while the increased tuition fee cap positively affected graduate outcomes, the heterogeneous impacts reveal the importance of targeted institutional support, career guidance, and widening access measures to programmes with integrated job-relevant training opportunities. Such support is particularly crucial for students at the lower end of the graduate outcomes distribution and those from underrepresented backgrounds, who face both heightened stakes in their educational investment and relatively constrained access to family occupational support.

Keywords: Higher education policy, Graduate outcomes, Socioeconomic status, Quasi-experimental design, the UK

Soft Skills Training in Germany: Does It Really Pay Off?

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This study investigates how soft skill training improves labor market outcomes in Germany. We use panel data from the German National Educational Panel Study (NEPS-SC6), administrative records from the Integrated Employment Biographies (IEB), and establishment-level files to look at key employment outcomes including earnings, span of control, and leadership responsibilities. We applied Sun and Abraham estimation for wages and difference-in-differences method for other dependent variables. Our first results indicate that soft skill training does not considerably increase daily pay. However, participants in the program tend to demonstrate better non-cognitive qualities, such as a reduced external locus of control, and a minor increase in extraversion and satisfaction with their level of life. On the other hand, people who received training appear to participate in fewer interactive professional tasks such as advising or client contact. Other outcomes, such as total job satisfaction and most personality factors, show mixed or minimal change.

Keywords: Non-Cognitive Skills, Soft skills training, Labor market outcomes

Estimating the Labor Market Outcomes of State Merit-Aid Scholarships- The Case of Tennessee HOPE

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Brian McCall (University of Michigan)

States aim to induce improvements in high school students' academic performance and increase postsecondary access and attainment at in-state colleges, through merit-based financial aid (Dynarski, 2004). Merit-based aid often delivers on these short-run goals (e.g., Pallais, 2009; Scott-Clayton, 2011) despite exceptions given disparities in program design across states (e.g., Domina, 2014). Rigorous research is limited on the effects of merit aid on earnings. Some evidence suggests that marginal students experience positive, albeit imprecise, earnings gains a decade after college entry (Bettinger et al., 2019; Scott-Clayton & Zafar, 2019). Compared to need-based financial aid, merit-based policies have weaker impacts (Nguyen et al., 2019), especially for low-income students (Herbaut & Geven, 2020). Scholarship eligibility, which could negatively impact college outcomes (e.g., Cummings et al., 2022). Our study evaluates whether the receipt or loss of a Tennessee HOPE scholarship affect students' post-college earnings. HOPE supports roughly 30,000 first-time freshmen annually (Tennessee Higher Education Commission (THEC), 2023). HOPE's primary eligibility criteria for Tennessee high-school graduates are measured by an ACT composite score (≥ 21) or cumulative high-school GPA (≥ 3.00). HOPE recipients received up to \$2,000 per term at the time of study. Once students are enrolled in college, renewal criteria must be satisfied to keep the award. Specifically, students must maintain a minimum cumulative college GPA (CCGPA), measured at a series of predetermined credit thresholds or checkpoints. Prior work found that HOPE does not affect whether eligible students attend college. Rather, HOPE primarily redirects students from community colleges into four-year public institutions (Bruce & Carruthers, 2014). Our study is the first to examine the effect of the HOPE receipt or HOPE loss on post-college earnings. In doing so, we scrutinize the extent to which merit aid effectively facilitates upward mobility for academically marginal students.

Keywords: labor market outcomes, higher education, merit-based financial aid, upward mobility

Teacher mobility to high-cost urban areas: A discrete-choice experiment in Portugal

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The design of new policies to attract and retain new teachers has been a top issue in many educational systems. In this work, we focus on which incentives work best in attracting teachers to hard-to-staff schools in high-cost urban areas. We conducted a discrete-choice experiment with approximately 800 teachers from 170 school clusters in Portugal, a country where teacher shortages are expected to worsen in the coming years. Alternatives differ in terms of school contract attributes related to location, salary, and stability. We find that substantial salary increases are needed to incentivize teachers to move to Lisbon, a high-cost urban area with severe teacher shortages. The results also provide insight into how to design cost-efficient incentives by taking into account the observed heterogeneity in teacher preferences in terms of several of their characteristics such as gender, experience, distance to school, and personal and material ties. We suggest that bonuses varying with distance and targeted to regions with higher scarcity may be an effective way to address shortages. Finally, we estimate a supply curve to quantify the additional expenditure in salary increases needed to attract teachers to Lisbon, allowing for wage discrimination by distance.

Keywords: teacher recruitment, teacher retention, teacher mobility, labour market, discrete-choice experiment

The impact of tertiary vocational education on local development in Italy.

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Tertiary Vocational Education and Training (VET) has been introduced in Italy in 2011, when the first Higher Technical Institutes (Istituti Tecnici Superiori, ITS) started offering their courses. The Italian Recovery and Resilience Plan (PNRR) has emphasized the strategic role of ITS for local development, strengthening the links of ITS (renamed Istituti Tecnologici Superiori or ITS academy) with Industry 4.0, and highlighting the role of ITS as providers for specific technical skills able to enhance socio-economic growth at the local level. Recent international research has focused on the impact of tertiary VET on individual labour market performance (Bockerman et al., 2018; Stevens et al., 2019; Auceio et al., JHR 2023), but little is known about their effects on economic and social development of the regions where tertiary VET institutes are located, and their graduates are likely to work. The aim of this paper is to investigate the impact of ITS on local development. More specifically, we leverage on heterogeneity across provinces and over time of ITS foundations to study whether the opening of an ITS foundation influences firm demography (i.e., firm creation and destruction), especially in industries overlapping the technological areas covered by ITS courses, innovation and local labour market performance, especially in terms of youth unemployment and NEET rate. The empirical analysis is based on province-level panel data from 2007 to 2023. We use a DiD approach following Callaway and Sant'Anna (2021) and our identification strategy relies on the variation in treatment timing, accounting for the heterogeneity in the opening year of the first ITS by province. The results show a positive impact of ITS opening on local economy and the evidence is more remarkable in Centre-South provinces. This has important policy implications, as supporting ITS openings may contribute to reduce disparities and to facilitate a catching up process.

Keywords: innovation, Istituti Tecnici Superiori (ITS), NEET, firm demography, local development

CHAPTER 7

EDUCATION AND WELLBEING

CAPITULO 7

EDUCACIÓN Y BIENESTAR



The Cost of Friendship: Who Is a Better Working Partner?

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This paper studies how team composition affects performance and well-being, to better understand the possible trade-offs students may face when working in groups. We conduct a lab-in-the-field experiment in schools in which students have to work with a randomly assigned partner. By comparing how pairs formed by students with different characteristics perform, we shed light on the relationship between group composition, well-being and performance. Our results indicate that students with a baseline ability below the median benefit from working in group, independently of the ability of their assigned partners, while students above the median do not. We also find that the relationship the students have with their partner affects their level of well-being when working together, but it has no impact on their performance.

Keywords: Peer Effects, Academic performance, Group formation, Friendship, Well-being

How does a 'good' degree influence students' wellbeing? The role of subjective beliefs

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This study examines how a 'good' degree affects students' wellbeing, focusing on the role of subjective beliefs about academic success, employability, and wage outcomes. Using data from a balanced panel of undergraduate students, we find that students' subjective probability of attaining a 'good' degree significantly enhances their university life satisfaction, with a 10 percentage-point increase in belief associated with a 1.5 to 4.1 unit rise in satisfaction. However, this belief does not significantly impact mental health, highlighting differing sensitivities of wellbeing domains. While performance shocks influence belief updates, they do not directly affect wellbeing, reinforcing the importance of long-term academic confidence over short-term feedback. Students perceive a 'good' degree as yielding a 27 percentage-point higher likelihood of employment and a £12,000 annual wage premium compared to a 'bad' degree. These results underscore the critical role of subjective beliefs in shaping students' wellbeing and career expectations.

Keywords: self-beliefs, Good degree, subjective wellbeing

Analysis of school violence reported by basic education teachers in Brazil

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Luiz Ivan de Melo Castelar (Federal University of Ceará)

Relatos de violência contra professores têm se tornado cada vez mais recorrentes no ambiente escolar. Somente em 2019, quase 18 mil professores de escolas públicas do Brasil sofreram ameaças, agressões, roubos e/ou atentados contra a própria vida em seu local de trabalho. Diante disso, este artigo analisa como as características individuais dos professores e o contexto escolar em que estão inseridos se relacionam com a probabilidade de serem ameaçados ou agredidos fisicamente por alunos ou familiares de alunos, de serem vítimas de violência extrema e de crimes contra o patrimônio dentro do ambiente escolar. Para isso, foram utilizados dados do SAEB, Censo Escolar e Plataforma de Indicadores Educacionais disponibilizados pelo INEP no ano de 2019. Os resultados obtidos com a análise de regressão logística multinível destacam a importância do fortalecimento das habilidades de gestão dos educadores, das relações de apoio existentes entre a direção da escola e o corpo docente, do engajamento dos pais no processo de escolarização dos filhos e da parceria entre família e escola para mitigar o problema da violência escolar.

Keywords: violence against teachers, work environment, multilevel regression models

Teacher absenteeism in Brazil: an analysis of absences due to illness

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Esta pesquisa analisa os fatores associados à frequência e à duração das faltas de professores por doença na rede pública de ensino no Brasil. Os resultados obtidos por meio de análise de regressão logística e modelos de sobrevivência, aplicados a dados da RAIS, SAEB, Censo Escolar, DATASUS e IBGE de 2019, mostraram que professoras brancas, com idade mais avançada e que lecionam na educação infantil tendem a se ausentar com maior frequência e por períodos mais longos. Trabalhar em municípios maiores, com menores níveis de renda e maiores índices de criminalidade, além de apresentar maior número médio de turmas e alunos por professor e maior percentual de escolas com problemas disciplinares nos alunos, também aumenta o risco de faltas por doença. Portanto, há necessidade de políticas públicas que melhorem as condições de saúde e de trabalho dos professores nas escolas, a fim de mitigar esse problema e reduzir os custos sociais e econômicos associados.

Keywords: work absenteeism, health issues, logistic regression, survival data analysis

The impact of Teachers' Mental Health on Student Achievement: A Matching Approach and Policy Evidence from PISA 2022

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Mental health has gained increasing relevance in recent years, with various aspects still to be addressed. The objective of this study is to analyze how working conditions affect teachers' mental health and assess a potential impact on academic performance. To this end, we use the latest available data from the PISA survey, which allows us to link information on teachers with student performance. We apply an econometric methodology based on Matching to mitigate endogeneity issues and form a suitable treatment group. This approach enables us to more precisely isolate the effect of deteriorating mental health (treatment) on academic performance. Additionally, we explore heterogeneity concerning gender and other relevant factors that may influence the magnitude of the relationship. This analysis aims to provide empirical evidence to understand and offer relevant insights for the design of potential public education policies.

Keywords: matching, Academic performance, mental health, pisa 2022

Relationship Between Career Adaptability and Competitive Attitudes Among Chinese College Students

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Wenjuan Gao (Beihang University)

Objectives: Previous research highlights the strong correlation between certain personality traits and individual career adaptability levels, yet the role of competitive personality remains underexplored. This study aims to fill the gaps by assessing the relationship between competitive attitudes and career adaptability among Chinese college students. **Methods:** A multi-stage stratified random sampling approach was used to conduct a cross-sectional survey of 692 undergraduate students from a top university in China. The final sample comprised 22.11% females and 77.89% males, aged 18–24, with a mean age of 19.54 years ($SD = 2.16$). Pearson's correlation and multiple linear regression analyses were utilized to examine the relationship between competitive attitudes and career adaptability. **Results:** Results showed that the average scores among college students were 10.068 for feelings for competition, 8.876 for beliefs about competition, and 7.802 for behavioral tendencies of competition. Significant gender differences were observed across all three dimensions ($p < 0.01$). In terms of career adaptability, the average scores for career concern, career control, career curiosity, and career confidence were 14.802, 15.601, 15.678, and 15.828, respectively, with no significant gender differences. Feelings for the competition had significantly negative impacts on career control and career curiosity (with coefficients of -0.149 and -0.110 , respectively). Conversely, beliefs about competition had significant positive effects on career concern, control, curiosity, and confidence (with coefficients of 0.223 , 0.200 , 0.207 , and 0.162 , respectively). **Conclusions:** The findings suggest that feelings for competition hinder the development of career adaptability, whereas beliefs about competition contribute positively to enhancing career adaptability.

Keywords: personality traits, college students, career adaptability, competitive attitudes

How competitive attitudes predict depression among college students in China

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Objectives: The competitive attitudes prevalent among college students, particularly within a highly competitive academic environment, have drawn substantial attention. While prior research has established a significant correlation between depression and individual competitiveness, the mechanisms underlying this relationship remain underexplored. This study addresses this gap by analyzing the relationship between competitive attitudes and depression among Chinese college students, with a specific focus on the mediating role of peer relationships and sleep quality. **Methods:** The study employed a multi-stage stratified random sampling method to distribute electronic questionnaires to 692 undergraduate students from a top university in China. Pearson correlation and regression analysis were utilized to investigate the relationship between competitive attitudes and depression. Furthermore, a structural equation model was employed to examine the potential mediating effects of peer relationships and sleep quality. **Results:** Significant gender differences were observed in competitiveness, with male students scoring significantly higher than female students in feelings, beliefs, and behavioral tendencies of competition. Feelings for competition exhibited a significant positive impact on depression, with sleep quality serving as a significant mediator, explaining 39.15% of the total effect. By contrast, beliefs about competition had a negative impact on depression, with peer relationships acting as a significant mediator, accounting for 17.09% of the total effect. There was no significant correlation between the behavioral tendencies of competition and depression levels. **Conclusions:** College students experience mild levels of depression on average. Feelings for competition exacerbated depressive disorders by negatively affecting their sleep quality. Conversely, beliefs about competition, which emphasizes personal development, alleviated depression by promoting positive peer relationships among students. Therefore, colleges and universities should cultivate personal development-oriented competitive attitudes among students while implementing measures to alleviate excessive competitive feelings, thereby contributing to the prevention of depression.

Keywords: depression, college students, competitive attitudes, peer relationships

Educational Reform, Labor Market Outcomes, and Family Formation in Italy

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This paper evaluates the impact of an educational reform on family formation and labor market outcomes as a key mechanism. We exploit the short vocational education training (IeFP) reform implemented in Italy in the early 2000s. The reform extended the duration of short vocational training from two to three years, increasing the number of hours dedicated to general skills subjects aimed at improving graduates' labor market outcomes. Using a staggered event study approach, we find mixed effects on family formation. For men, the reform increases the probability of marriage. However, for women, the reform has no significant impact on marriage but leads to a decline in childbearing. The improvement in labor market outcomes appears to drive these results, highlighting a trade-off between career and family for women, while no such trade-off is observed for men. Our findings suggest that educational reforms of this nature may have significant effects beyond labor market outcomes, influencing demographic and social dynamics.

Keywords: Vocational Education, labor market, marriage, childbearing