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## **Supervisor Expression of Interest MSCA - Marie Sklodowska Curie Action - (PF) Postdoctoral Fellowship 2023**

**Supervisor name: Tommaso Agasisti**

**Email address: [tommaso.agasisti@polimi.it](mailto:tommaso.agasisti@polimi.it)**

**Link “Pagina docente”:** [Tommaso Agasisti](#)

**Department Name: Department of Management, Economics and Industrial Engineering**

### **Research topic:**

MSCA-PF Research Area Panels:

- ECO\_Economic Sciences
- ENG\_Information Science and Engineering
- ENV\_Environmental and Geosciences
- LIF\_Life Sciences
- MAT\_Mathematics
- PHY\_Physics
- SOC\_Social Sciences and Humanities
- CHE\_Chemistry

### **Brief description of the Department and Research Group (including URL if applicable):**

The Department of Management, Economics, and Industrial Engineering (DIG) of Politecnico di Milano was established in 1990. Its mission is to have a positive impact on society by creating and sharing knowledge at the crossroads between engineering, management, and economics. To this end, it engages in outstanding research, high quality education, and service to the community. Specifically, DIG pursues scientific excellence by adopting a tailored approach which relies on multi-disciplinarity, diverse methodologies, and intense connections with practitioners and policymakers. With approximately 140 professors, DIG is one of the largest departments of Politecnico di Milano. More information can be found at: <https://www.som.polimi.it/en/>

DIG HumanTech program has been selected and funded by the Ministry of University and Research (MUR) for the period 2023-2027 within “Dipartimenti di Eccellenza” (Law 232/2016), the ministerial initiative aimed at rewarding the departments that stand out for the quality of their research and at financing specific development projects.

In particular, the objective of HumanTech is to redefine the relationship between technology and human beings so as to enable a sustainable digital transition of industrial systems. The project aims to propose new models and processes for the development and adoption of technologies, capable of



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accelerating the transition towards sustainable, inclusive industrial systems that make individual and collective well-being a priority.

The reference research group is named ReMAPS – Rethinking Management in the Arts and the Public Services that carries on studies and applied researches aimed at supporting institutions and organizations that operate in the strategic fields of Arts and Public Services to rethink and innovate how policies and management are designed and implemented. The three research fields are: art and cultural heritage; education; local administration.

Link to the research group page: <https://www.remaps.polimi.it/>

### **TITLE of the project: Data analysis for educational equity and efficiency**

#### **Brief project description:**

Although governments have made various efforts to enhance the quality and availability of education, there is still a long way to go and many challenges to overcome (OECD, 2022). In a context of limited resources, it is fundamental to maximize the proper use of organizational resources, in order to achieve a more equitable and efficient educational system. Identifying education and training policies that ensure an efficient use of public resources and lead to higher learning outcomes result in a positive effect at individual and societal levels. However, evidence on the efficiency of educational interventions is still advocated (De Witte & Lopez-Torres, 2017). What is even lacking more is reliable information on the costs of educational programs, making thus difficult to provide evidence on cost-benefit or cost-effectiveness of educational interventions (Levin, 2001).

Strengthening the current knowledge on efficiency of educational institutions represents a key for designing evidence-based policies at national level but also to support educational institutions (either school or universities) at international level (Johnes et al., 2017). In the long term, evidence would support the creation of models that are more human-centered, to contribute to people's well-being and respond to today's social challenges.

The project aims at filling this gap by adopting a quantitative perspective through the use of multiple methodologies. First, a systematic literature review of academic and institutional papers related to the literature on efficiency allows to gain an overview of the current evidence. In particular, the review should highlight (i) the methodologies used in previous research (ii) the indicators for measuring organizational inputs and outputs and (iii) the factors explaining more the heterogeneity in the levels of organizational efficiency. Second, by means data merged from different sources (e.g., Eurostat, World Bank, OECD) efficiency analysis will be carried out by adopting different methodologies like Free Disposal Hull and Data Envelopment Analysis models, as well as four-component Stochastic Frontier Analysis and Malmquist Index. The sample of observations would include multiple European countries, with the aim of comparing and contrasting results. The final step of the analysis would consist of establishing the main policy levers and qualitative elements of the different educational systems that may explain heterogeneous efficiency levels.



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Overall, the project aims to fill a gap in the literature as well as in evidence-based policies on education and training policies that can foster educational efficiency in the European context. In so doing, the project contributes to the academic and practitioner debate on the proper adoption of policies and use of resources, from a human-centered perspective.

#### References.

De Witte, K., & López-Torres, L. (2017). Efficiency in education: a review of literature and a way forward. *Journal of the Operational Research Society*, 68(4), 339-363.

Levin, H. (2001). Waiting for Godot: cost-effectiveness analysis in education. *New directions for evaluation*, 2001(90), 55-68.

OECD (2022), Education at a Glance 2022: OECD Indicators, OECD Publishing, Paris, <https://doi.org/10.1787/3197152b-en>.

Johnes, J., Portela, M., & Thanassoulis, E. (2017). Efficiency in education. *Journal of the Operational Research Society*, 68(4), 331-338.