Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
GRINS FOUNDATION

# Report on the project *Informed Educational Choice*

# (University of Padova sub-project)

## Work Package N.2 (Human Capital)

## Spoke N.3 (Household Sustainability)

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Project status refers to December 2023

# Executive summary

Our research is part of "Informed Educational Choice", a large project that accompanies other works devoted to examining households' sustainability (Spoke 3) through the lenses of human capital investments (Work Package #2). Our work, led by the University of Padova, studies the main determinants of school choices with a focus on post-secondary education using newly collected survey data.

We propose to study a relevant determinant of Italian households' sustainability: individuals' investment in human capital. This topic is more than ever relevant, amidst the economic and financial upheavals that have characterized the country over the last two decades, and the vulnerability of Italian households induced by the recent pandemic.

We plan to interview students attending the last year of secondary school in Italy, who are about to make their decision about tertiary education (whether to enroll to university or not, and which field of study to choose).[1] We will measure their expectations in terms of monetary and non-monetary returns to education, and plan to create indicators on how much those expectations differ from current labor market data. We will also collect a wide range of demographic data and educational preferences which will further inform us on the determinants of students' investment in human capital.

[1] The survey is funded by the European Union - NextGenerationEU, in the framework of the GRINS -Growing Resilient, INclusive and Sustainable project (GRINS PE00000018 – CUP E63C22002140007). The views and opinions expressed are solely those of the authors and do not necessarily reflect those of the European Union, nor can the European Union be held responsible for them.

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# 1. Section 1: Roadmap

The present document aims to summarize the contribution, current status and developments of the survey on the role of parenting on human capital and on students' motivations for their last school choice included in the larger project "Informed Educational Choice" which is part of the WP#2 "Human Capital" of Spoke 3.

The report is organized as follows. In Section 2 we describe how the content of "Informed Educational Choice" inserts itself and contributes to the Work Package #2 and more broadly to the Spoke 3 initiative. In Section 3 we describe in detail the research team. We close the report with Section 4, where we lay out what the project has already achieved, detailing carefully every step worked on so far.

# 2. Section 2: Project's contribution to Work Package #2 and Spoke 3

The project constitutes an integral component of an extensive array of works devoted to examining households' sustainability (Spoke 3) through the lenses of human capital investments (Work Package #2). The saliency of this topic could not be overstated, particularly against the backdrop of the economic and financial upheavals that have characterized Italy over the last two decades. Meanwhile, the recent pandemic has left Italian households particularly vulnerable to socio-economic shocks, making it more than ever necessary to provide families and individuals with the relevant tools and knowledge to face their economic decisions.

The economic actors of the Spoke 3 are households and their members, who often need to make choices under uncertainty, with limited information, or facing limitations in their ability to process it. The overarching goal of the project is to bridge this informational divide, especially concerning one of the pivotal decisions young adults encounter in their lives: their investment in education. There is a vast, rooted and growing economic literature that suggest that human capital, as captured by individuals' education, is an important determinant of people lifelong income distribution (among others, the seminal works by Becker and Chiswick, 1966, and Mincer, 1974, and other crucial works by Nobel laureate Heckman, 2000). Therefore, being able to make such decision with as much information as possible is crucial for the generations of young adults who will face the socio-economic consequences of the COVID-19 pandemic and the long-lasting consequences of Italy's struggling ability to recover from the financial crisis.

The aim of project "Informed Educational Choice" is threefold. First, through a detailed and exhaustive survey delivered to Italian high-school students in the process of opting in for their post-secondary education we will be able to assess the current trend in young adults' educational and income expectations. The survey, which focus on the determinants of high-school students' university choices, will therefore take a snapshot of what are the factors that

young adults perceive as important when deciding whether to enter university or not, and which discipline to focus their studies on. We believe it is extremely important to understand this phenomenon, as university choices have a direct impact on young adults' future employment, and therefore on their future household sustainability.

Second, by comparing students' expectations in terms of economic returns from their university choices with modern and detailed data on actual job-specific wages, we will be able to assess if students base their educational choices on rational expectations, and if the information they have regarding their future employability in the moment they make their post-secondary education choices are correct. We believe this is fundamental given some alarming facts that describe recent trends in the Italian university environment. To give some examples, 14% of university students drop out after the first year; less than 4 out of 10 students enrolled in a bachelor degree graduates on time; females are severely under-represented across technical and scientific fields of study although their university enrollment rates are overall higher.

Last, thanks to this comparison, we aim to help closing the likely informational gaps that exist between students' expectations and real employment outcomes, providing schools and young adults with more accurate details on the Italian labor market, thus helping them making *informed educational choices*.

Summarizing, the project speaks to the young economic agents of the households, who nonetheless are at a critical juncture in their life as they decide whether to pursue their education and choose a field of study. Recognizing the pivotal nature of these choices, our research endeavours to contribute to the future financial and socio-economic stability and sustainability of these young adults.

# 3. Section 3: The team

The research team consists of three professors and two researchers at the University of Padova. The three professors are: Associate Professor Elisabetta Lodigiani, Principal Investigator for the project "Informed Educational Choice" and also leader of the Work Package #2 "Human Capital", Professor Giorgio Brunello, and Professor Lorenzo Rocco. The two researchers are Assistant Professor Francesco Campo and Assistant Professor Martina Miotto, both recruited on PE9-GRINS funds. The team combines varied and complementary skillsets. Professors Lodigiani, Brunello and Rocco all have a long strong record of scientific research in the branches of economics of education and labor economics. Their work has been published in the best-respected economics journals for these fields (such as Economics of Education Review, Journal of Labor Economics, Review of Economics of the Household, Journal of Human Capital). Further, all team collaborators have published their previous research in top general-interest economics journals (for example, Economic Journal, Journal of the European Economic Association) and leading field journals (such as Journal of Economic Growth, Journal of Development Economics, Journal of Health Economics).

# 4. Section 4: The project

As previously outlined, *Informed Educational Choice* is included in the Work Package that studies human capital investments and investigates the main determinants of school choices with a focus on post-secondary education. This topic is highly important when it comes to understand households' sustainability and positions itself at the crossover of many economic literatures.

With this project we aim to achieve two important goals. First, we will shed light on how university choices are sensitive to expected monetary and non-monetary returns to education, and how the sensitivity differs alongside geographic, gender and ethnic dimensions. We will do so by implementing a detailed and exhaustive survey delivered to Italian high-school students in the process of opting in for their post-secondary education.

Second, we will construct relevant economic indicators to track if students' expectations are in line with real data. We will do so by looking at the deviation of self-beliefs on expected earnings by university-major choices from plausibly real population values of the corresponding variables built from secondary data, such as the Labor Force Survey.

In what follows we will describe in more detail the overall project, summarizing how this topic contributes to the economic literature, and the steps that the project comprises of, carefully detailing what we have achieved so far.

## 4.1 Literature review

The literature on human capital investment is vast and growing. Bridging the seminal standard models of schooling decisions (Becker, 1993; Ben-Porath, 1967; Mincer, 1974) with the more recent state-of-the-art experimental literature (Wiswall and Zafar, 2015a, 2015b, 2018, 2021) is a plethora of well published research that focused particularly on the role that different types of information have on schooling choices. This literature includes works that are related to each other but also complement themselves by focusing on different population samples or type of information asymmetry examined.

We will now provide a short summary of this literature to review the most salient papers related to ours and give examples on how our research agenda compares to them.

A dimension alongside the literature splits concerns the geography of the population studied. Much work has indeed focused on the American continent (for the USA see for instance Arcidiacono et al. 2011; Avery, 2010; Baker et al. 2018; Bleemer and Zafar, 2018; Conlon, 2021; Patnaik et al. 2020; Ruder and Van Noy, 2017; Winswall and Zafar, 2015a, 2015b, 2018, 2021; Zafar, 2013; for Central and South America remarkable papers are Attanasio and Kaufmann, 2014; Avitable and de Hoyos, 2018; Bonilla-Mejía et al. 2019; Dinkelman and Martínez, 2014; Hastings et al. 2015; Jensen, 2010; and for Canada an example is Oreopoulos and Dunn, 2013), with much less attention on other continents including the European one. Important exceptions are the studies by Peter and Zambre (2017) and Peter et al. (2018) which focus on Germany, Kerr, et al. (2020) who look at

Finland, and McGuigan et al. (2016) for the United Kingdom. Relevant for our context are especially those that are set in the Italian country, as Ballarino et al. (2022), Barone et al. (2017), and Barone et al. (2019). We contribute to these papers as we provide more evidence-based research for an understudied continent, and we also improve on the ones that are already set in Italy by extending the geographical coverage from the four provinces that they study, to a more heterogeneous representativeness of the whole country.

Another relevant aspect to consider is the sample of students observed, and how they vary with respect to some salient characteristics. For example, the literature covering the USA is overwhelmingly focused on high-achieving students attending private universities (Avery, 2010; Wiswall and Zafar, 2015a, 2015b, 2018, 2021; Zafar, 2013), while the one covering Central and South America mainly targets students coming from disadvantaged backgrounds (Attanasio and Kaufmann, 2014; Bonilla-Mejía et al. 2019). In our research we draw from a heterogeneous pool of students therefore not selecting on the basis of merit or economic characteristics. Further, since we look at the whole country and not just at four provinces, as in the above cited papers covering the Italian peninsula, we leverage over yet unexplored Italian socio-economic realities.

In parallel, we also contribute to the literature that studies human capital investments not only for the monetary returns, but also for other motivations - for instance, when there are preferences for other job characteristics such as working-time flexibility or remote working possibility. We do so by asking a long array of questions about the returns for non-monetary aspects to different educational scenario, therefore taking into account more elements than what is often considered in our reference literature.

Other two features make our research particularly important. First, while works on human capital investments are large in number, they are vastly based on surveys or administrative data collected before the outburst of the recent pandemic. Meanwhile, there exists evidence on how shocks shape individual choices on human capital investments (for instance, Dasgupta and Ajwad, 2011). We believe our study can contribute to unveil if educational choices after COVID-19 are on different trajectories than earlier generations' ones.

Second, while the papers cited so far try to assess the role of new information on human capital decision investments, in our project we remain agnostic on the role of such signal, and rather use our resources into detailing a multitude of different elements that might play a role into schooling choices. The data we collect will help to draw a comprehensive picture of what are the reasons behind high schoolers university choices both in the extensive margin (whether to enroll or not) and in an intensive-fashion margin (which field of study to pursue). With this information, we can then model human capital investment choices and inform the next steps of future research on Italian return to education opportunities.

## 4.2 The design of the project

The study consists of two phases. During the first phase (December 2023-April 2024) we plan to survey high school students during their last year of secondary school. During the second phase (March-April 2025), we plan to follow up with a sub-set of the initial sample and incentivize individuals' participation with a gift voucher worth 20 euros. This way we will construct a panel of data that allows us to follow students over time (before and after their post-secondary education choice), and see how their expectations change alongside their human capital investment experience.

## 4.3 The study sample

For the first phase of the study, the target population is made up of students attending the last (fifth) year of secondary schools in Italy. In particular, the study will initially focus on students of lyceums[2], those with higher probability to enter tertiary education. The target population will be reached directly through their schools, which will in turn be recruited by the survey provider we contracted by way of contacting school's principals via email.

The final sample of the first phase will consist of 100 schools distributed nationwide, with representative quotas based on geographical areas (5 areas, NUTS1). The objective of the data collection is to respect the representative quotas at the national level; if necessary, the data will be weighted.[3] The average number of classes involved will be 2 per school, with the option to interview 1 or 3 classes per school, totaling 200 classes and a minimum of 3000 students, estimating an average of 15 students per class.

The study envisions a second follow-up phase. Individuals' participation to the follow up is subject to their prior authorization to be re-contacted by the survey provider. We expect to be able to reach a minimum of 600 students (20 percent of respondents of phase 1) and a maximum of 1500 students (50 percent of respondents of phase 1).

## 4.4 The survey instrument (phase 1)

The survey starts with a welcoming message that aims to familiarize students with the content of the survey, to describe its length and features, and to remind respondents that we are asking for their opinions rather than testing their knowledge. Students are further asked to read an official document regarding the processing of their personal data and give their consent before the real survey begins.

[2] In Italy there exist six categories of lyceums that focus on different disciplines: classical studies, scientific subjects, foreign languages, arts, music, and human sciences.
[3] Geographical distribution of lyceums to be used for weighting: 21% North-West, 14% North-East, 19% Center, 32% South, 14% Islands.

The questionnaire consists of 55 questions divided into four different sections.

The first section gathers general demographic information about students and their family (Section I: Demographic information and family background). We ask information on students' gender, age, immigration status, and on family background such as parent's immigration status, occupational status, educational level of family members including older brothers/sisters and grandparents, and field of study of family members if tertiary educated. The answers to these questions are closed-ended and include an option for students who prefer not to provide the requested information. Through this section we aim to anchor students' educational profile and choices to their family's background. There is, indeed, a large theoretical and empirical literature that show the role that intergenerational accumulation of human capital plays on social mobility (among others, Becker 1986; Card et al., 2022) and it is therefore important to consider this aspect in our study.

The second part of the questionnaire collects information on students' beliefs about the monetary returns of tertiary education at different points in time of their future life, when they are 30 and 40 years old (Section II: Economic expectations). Questions are designed to recover this information for different educational scenarios, regardless of which field of study students intend to apply to in the future. Specifically, the scenarios are seven: one in which no tertiary education is pursued, and six where we group different macro-categories of fields of study. These six categories are: 1) Civil Engineering, Architecture, and Design; 2) Engineering, Information Communication Technology, Mathematics, Physics, and Natural Sciences; 3) Economics, Business, and Law; 4) Medicine, Veterinary Medicine, and Health Professions; 5) Psychology, Political Sciences, and Other Social Sciences; 6) Literary Studies, Philosophy, and Humanities. Therefore, students go through a battery of questions that are each repeated seven times: one for every different educational scenario.

The aim of asking these questions imagining to be 30 and 40 years old, is to recover the life-time income distribution expectations of students. This will allow us, in the future, to analyze not only how students' expected income influences educational choices, but also the role played by the variability of such income (see for instance Wiswall and Zafar, 2018).

In the first question, students are asked to provide their beliefs about the minimum and maximum monthly salary they could expect to earn by the age of 30 if they were working full time and had fully pursued educational choices reflecting each of the previous seven scenarios. At this point students are also further reminded that there is no right or wrong answer to these queries, and they only have to state their beliefs. The question reads as follow (the entries in italics symbolize the possible answers):

Imagine that you have enrolled and graduated in one of the courses in each of the categories in the table below, or that you are not graduated. Imagine in each scenario being 30 years old and working full-time. Based on the information you have, how much do you believe your monthly MINIMUM and MAXIMUM earnings could be in euros?

| | MINIMUM monthly earnings | MAXIMUM monthly earnings |
|---|---|---|
| Civil engineering, Architecture, and Design | *Q30[1,1]* | *Q30[1,2]* |
| Engineering, ICT, Mathematics, Physics, and other Natural Sciences | *Q30[2,1]* | *Q30[2,2]* |
| Economics, Business, and Law | *Q30[3,1]* | *Q30[3,2]* |
| Medicine, Veterinary Medicine, and Health Professions | *Q30[4,1]* | *Q30[4,2]* |
| Psychology, Political Sciences, and Other Social Sciences | *Q30[5,1]* | *Q30[5,2]* |
| Literary Studies, Philosophy, and Humanities | *Q30[6,1]* | *Q30[6,2]* |
| Not graduated | *Q30[7,1]* | *Q30[7,2]* |

Students are subsequently asked to assign probabilities to the realization, still at the age of 30, of three monthly income thresholds, varying according to the answers provided in the previous questions – and still considering all the seven different scenarios. Here an example reflecting one of the seven scenarios:

Imagine having obtained a university degree in the group of courses "Civil engineering, Architecture, and Design", to be 30 years old and work full-time. Based on the information you have, what is the percentage probability (from 0 to 100) that YOUR monthly earnings are greater than or equal to the values in euros in the table below?

| | Probability that YOUR monthly earnings are greater than or equal to: |
|---|---|
| *0.75*Q30[1,1]+0,25*Q30[1,2] €* | |
| *0.5*Q30[1,1]+0,5*Q30[1,2] €* | |
| *0.25*Q30[1,1]+0,75*Q30[1,2] €* | |

Since the previous questions require an understanding of the concept of probabilities, we provide students with a brief and simple explanation before they start answering. The provided example is also accessible at each question to make sure students remember and consider each query the same way.

Next, students are asked what are their average monthly income expectation in each scenario by the age of 40. While we would have liked to ask also for this age more information that could have helped us retrieving their income distribution expectations, we decided not to in favor of saving up time for other equally important questions.

The third part of the survey collects information on students' beliefs about the non-monetary returns of tertiary education (Section III: Expectations about job characteristics). Again, we ask students to identify with all seven educational scenario, and then for each we ask questions regarding: the probability by the age of 30 to have a stable occupation; the probability to have remote working arrangements; the expected daily working hours; the probability that an easy work-life balance is achievable; the probability to work as an entrepreneur or a freelance. In all these questions students retain the possibility not to answer, and are reminded of the concept of probabilities through our example.

In the last batch of questions for this section we elicit students' beliefs about their willingness to study and work away from home, including an option for moving abroad. Again, the questions reflect the different educational scenarios[4].

The last section of the questionnaire (Section IV: Preferences skills and attitudes) collects a battery of questions on students' preferences, attitudes, and abilities. We ask students what are their expectations regarding the probability of succeeding to graduate in each educational scenario, and their expected relative class ranking in terms of ability would they enroll in each of the different macro-categories of fields of study.

This section also includes two important questions about the probabilities students assign to their enrollment in each educational scenario, including the possibility not to enter university at all. We ask this question separately for their expectations regarding a bachelor degree and a master degree. As these are vital information for our survey, we report here the exact framing of both:

What are the percentage probabilities (from 0 to 100) that you choose to enroll in one of the courses in each of the groups in the table below or that you do not enroll in university?

| | Probability (0-100) of choosing post-secondary education path |
|---|---|
| Civil engineering, Architecture, and Design | |
| Engineering, ICT, Mathematics, Physics, and other Natural Sciences | |
| Economics, Business, and Law | |
| Medicine, Veterinary Medicine, and Health Professions | |

[4] The question on studying away from home does not include the "no tertiary education" scenario.

| | |
|---|---|
| Psychology, Political Sciences, and Other Social Sciences | |
| Literary Studies, Philosophy, and Humanities | |
| Not enrolled in university | |
| Total | |

Imagine being enrolled in one of the bachelor degree programs from each group in the table below. What is the probability (from 0 to 100) that, once you have obtained the bachelor degree, you choose to enroll in a MASTER degree program?

| Bachelor Degree in: | Probability (0-100) to enroll in a master degree |
|---|---|
| Civil engineering, Architecture, and Design | |
| Engineering, ICT, Mathematics, Physics, and other Natural Sciences | |
| Economics, Business, and Law | |
| Medicine, Veterinary Medicine, and Health Professions | |
| Psychology, Political Sciences, and Other Social Sciences | |
| Literary Studies, Philosophy, and Humanities | |

The last part of the questionnaire elicits students' preferences over different educational paths by means of a discrete choice-style exercise. We measure their implicit willingness-to-pay for studying different fields of study by showing pairs of wage scenarios dependent on their educational choices. For example, the following question compares studying Literature, Philosophy, and other Human Sciences with Civil Engineer, Architecture, and Design:

We now ask you to choose an alternative between the pairs of alternatives below. Do you prefer to study "Literary Studies, Philosophy, and Humanities" and earn 1500 € per month or to study "Civil engineering, Architecture, and Design" and earn X € per month (with X varying in each row of the table below)?

| Literary Studies, Philosophy, and Humanities | Civil engineering, Architecture, and Design |
|---|---|
| 1.500 €<br>○ | 500 €<br>○ |
| 1.500 €<br>○ | 750 €<br>○ |
| 1.500 €<br>○ | 1.000 €<br>○ |
| 1.500 € | 1.250 € |

| | |
|---|---|
| ○ | ○ |
| 1.500 €<br>○ | 1.500 €<br>○ |
| 1.500 €<br>○ | 1.750 €<br>○ |
| 1.500 €<br>○ | 2.000 €<br>○ |
| 1.500 €<br>○ | 2.250 €<br>○ |
| 1.500 €<br>○ | 2.500 €<br>○ |

One further interesting feature of the questionnaire is that it entails a randomization exercise between some specific sets of questions that will allow us to consider that students might reply differently when asked questions in different order. There is a vast literature that poses attention to survey designing, as both questions ordering and their framing have been found to bias how individuals respond (for example, Deaton, 2012; Suchman and Presser, 1981; Tourangeau et al., 2000). To consider some of these problems, we will randomize the order of some questions and how answers to some others are displayed.

At the end of the questionnaire students will be asked to express their consent to be contacted again in occasion of the second phase of the project, and other consents necessary to link students' data to other datasets, such as the Anagrafe Nazionale Studenti (the National Students Registry) and the INVALSI tests.[5] While these additional data are not necessary for our project to run, being able to use them would surely enrich our study of a valuable information on how high school paths are shaped by students' past decisions and performance, helping us understanding how students also form future expectations.

[5] INVALSI (Italian Institute for the Evaluation of the Educational System) is the national agency that carries out each year national testing of students' competences in Italian, English and math. Standardized tests are compulsory and administered every year to the entire population of students in the second, fifth, eighth and tenth grades.

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