Ascending the Social Ladder: Exploring Professional Advancement and Employability Among First-Generation Graduates

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Abstract

This study delves into the impact of higher education on the employability of first-generation students, with an analysis of the interplay between education, socio-economic background, and career prospects. The study begins by examining the data from the National Survey on the Employability of Higher Education Graduates (CNAAIS). The discussion primarily focuses on employability outcomes, identifies influential factors, and evaluates institutional interventions to shed light on the employability gap that first-generation students often face.

The study uses the data from the CNAAIS as a reference to answer the research questions. The results of the survey demonstrate that the employability process of a higher education graduate can be correlated with different types of influencing factors, including educational-related, socio-economic-related, general, or specific variables, such as other types of professional experiences during university studies. However, a particular conclusion that can be drawn from the data is that first-generation students tend to earn lower median incomes and have a higher rates of underemployment than their peers with at least one parent with a higher education degree.

Despite this, first-generation college students tend to develop more in-depth skills in some areas, such as foreign languages or introductory and advanced IT, than their colleagues from a more educated family background. However, these skills are not sufficiently leveraged to overcome the discrepancies that appear among first-generation students and those with a history in education. Hence, it is crucial to consider variables such as networking, professional mentoring and coaching, or simultaneous development of other types of highly needed skills for the labour market, such as capacity to negotiate. Additionally, discrimination that might arise against first-generation students when it comes to employability due to their socio-economic status or biased hiring practices should also be considered.

1. Introduction

1.1. What are first-generation graduates?

Access to higher education and the outcomes of university studies are well-represented subjects in the academic literature. This study aims to investigate the challenges first-generation graduates face regarding professional advancement and employability. The term 'first-generation graduates' refers to those whose parents never enrolled in post-secondary education. (Nunez, Cuccaro-Alamin and Caroll 1998). In order to have a better understanding of their context, the article will also explore topics concerning first-generation students, as the educational experience is relevant to their employability (Pascarella, et al. 2004).

The academic literature shows great interest in first-generation students or graduates. However, these studies refer more often to US colleges, representing up to a third of the student body (Ives and Castillo-Montoya 2020). Studies on first-generation students typically consider a comparison with students whose parents attended tertiary education, aspects related to their access to higher education and student attrition and graduate perspectives (Hirudayaraj, First-Generation Students in Higher Education: Issues of Employability in a Knowledge Based Economy 2011).

1.2. Importance of parental education: cultural capital and access to higher education

Parental education is a significant factor in theories of social and cultural reproduction. First-generation students face challenges within their academic journey since education systems can reflect and exacerbate existing inequalities. Though it holds an inherent promise for social mobility, the education system usually favours and transmits dominant social classes' cultural norms and knowledge. Students from less privileged classes, such as first-generation students, lack the cultural capital, including support at home or exposure to literature and art, leading to an 'uneven' situation within schools and universities field (Bourdieu 2018, Bernstein 1981)

Edgerton and Roberts (2014) underlined that inequality is repackaged as meritocracy, attributing differences in socioeconomic outcomes to an individual's abilities or inherent worth rather than deeply entrenched inequalities. Under the "hierarchy of gifts or merit", societal mechanisms perpetuating the inequalities are masked, further disadvantaging those already behind.

While economic and social capital is more easily understood, the definition of cultural capital generates debates and disagreements. Bourdieu (1984) contends that cultural capital has three primary forms, namely (1) institutionalised cultural capital, formally recognised and legitimised through institutions such as universities; (2) objectified cultural capital, embodied in material objects that can signal one's cultural taste and status and (3) embodied cultural capital, exemplified through linguistic competence or manners. Academic success is determined not only by effort or inherent ability but also by how society and the education system value signals of wealth and social class alongside actual skills. Bias can arise when teachers misinterpret valid knowledge presented in an unfamiliar way. A student could encounter less encouragement simply because it doesn't match the unspoken mould of a 'star student'. Also, their intelligence or contributions may be undervalued due to access, communication style, or less polished manners within the specific setting of academia. Therefore, socioeconomic barriers can exacerbate the negative impact of a lack of cultural capital on the academic success of students with less of it.

Dumais and Ward (2010) argue that the above-mentioned are noninheritable, so cultural capital is "unrecognized as capital and recognized as legitimate competence" compared to the other types of capital. Due to this status quo, they reason that educational systems reward peers for their cultural capital rather than their 'natural academic talents', as claimed. This affects first-generation students compared to their non-first-generation peers, as cultural capital is cultivated in time through the '*right* kinds of cultural training' (Bourdieu 1973). Opportunity gaps may be reflected in the distribution of scholarships or internships, favouring those already advanced. Additionally, students without a higher cultural capital may doubt their abilities and limit their aspirations, resulting in a loss of diverse talent.

Parental education is a crucial factor in inter-generational educational attainment (Black and Devereux 2011), particularly in higher education (Burnhill, Garner and McPherson 1990). However, some scholars question the significance of cultural capital in terms of access to higher education (Dumais and Ward 2010). According to Solon (2004), children with higher-income parents have a greater chance of earning more due to a more significant investment in their human capital and education. This investment makes them more likely to graduate from higher education than their peers with limited economic capital. In France, a study conducted by Bonneau and Grobon (2022) found that a 10-percentile increase in parental income is associated with a nearly six percentage point increase in the likelihood of children obtaining higher education.

Education systems can often inherently favour students from dominant social classes, valuing specific cultural knowledge and expectations aligned with traditional social power holders. This can create bias and inequality in education. Subsequently, students with lower levels of cultural capital, such as first-generation students, may face systematic disadvantages and additional barriers. The understated role of cultural capital can be challenging to identify and may be mistaken for competence rather than accumulated advantage.

2. Methodology

2.1. Data source

Our analysis concerning first-generation graduates relies on both administrative data from National Student Enrolment Registry (RMUR) and the National Survey on the Employability of Higher Education Graduates (CNAAIS) that are relevant for Romania. The survey was conducted by the Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) using the same infrastructure (Deaconu and Hâj 2022a) and data processing techniques (Deaconu and Olah 2022) as in the case of National Student Survey in Romania (NSS-RO). The total number of survey respondents was 8,857 between 17 November 2021 and 28 February 2022.

Respondents who did not fully answer the relevant questions were taken out from the database. After database cleaning, the total number of cases that were taken into consideration was 6,636 due to some additional filters (e.g. respondents from military universities were exclude, the cases were limited only to bachelor's and master's degree, only full-time students were considered). The survey covered two graduates' cohorts: 2021 (T+1) and 2016 (T+5). Data was weighted to reduce sampling error and potential non-response bias based on gender and study field (Deaconu and Hâj 2022b).

2.2. Limitations of the study

The limitations of the study concern especially data collection as there were several constraints addressed through data cleaning and consideration of only relevant cases for some variables (Deaconu and Hâj 2022b):

- Lack of personal administrative data (e.g. e-mail address) for more than 50% of higher education graduates in the years analysed (2016 and 2020) determined self-selection bias.
- Insufficient knowledge of the occupations practiced in the national economy has caused confusion for some respondents.
- Lack of administrative and/or collected data on current tax residence and type of employer.
- Net incomes delivered by the respondents led, in some cases, to some errors starting from the wrong entry of some amounts they received which became maximum outliers.
- The effect of survey fatigue in the context of the significant increase in the number of online surveys contributed to a decrease in the pool of potential respondents, without being able to estimate an exact percentage.

The data presented by CNAAIS pertaining to first-generation students sheds light on the profile of such students, who lack a familial history of higher education. However, it is worth noting that the analysis did not factor in variables such as the enrolment or graduation status of the student's siblings in university courses. This highlights the need for a more comprehensive approach in the future to better understanding the challenges and opportunities faced by first-generation students in pursuing higher education.

2.3. Data analysis

To gain a deeper understanding of the educational experience and labour market integration of first-generation graduates, various categories of variables gathered from administrative data and surveys were analysed. The methodology outlined in the CNAAIS Report (Deaconu and Hâj 2022b) includes the following elements:

- **Social and background**: gender, age (at the moment of graduation), county (NUTS-3) or development region (NUTS-2) for birthplace or at enrolment, the environment of the residence (rural or urban), marital status, precarious social and economic status (if a student has a social scholarship or special social status – e.g. orphanage), highest educational attainment in family, first-generation student profile, average score at upper secondary final examination (Baccalaureate).
- **Educational status:** study degree, study field (ISCED-F 2013), means of financial support, scholarships, student accommodation, on-time graduation.
- **Perception on personal and professional experience during studies**: internships, volunteering, study mobilities, the perceived role of education in employment, the perceived role of university prestige in employment.
- **Transition and insertion into the labour market:** employment during studies, employment after graduation (for both generations), vertical mismatch, net average income (at the time of survey).

The employment status of undergraduate and graduate students was defined as engaging in an economic activity that generates income through salaries, benefits, or other forms of compensation. Various types of employees have been identified based on their contractual arrangements (e.g. unlimited term, fixed term) and sector of work (public, private, self-employed) as well as individuals who may not be currently employed, such as those who volunteer, take parental leave, are medically incapacitated or are solely focused on education. This category also includes housewives and husbands staying at home.

The study also deals with the concept of occupational vertical mismatch, more commonly referred to as overqualification. This is when a university graduate is employed in an occupation that is classified outside the Romanian Classification of Occupations (COR) Major Groups 1 and 2. These major groups are designated by Romanian law as those that could require higher education qualifications. Therefore, working in any other COR group indicates that the educational level of the graduate exceeds the job's typical requirements. The data is subject to international comparability as COR correlates with the International Standard Classification of Occupations (ISCO-08).

When processing data, the analysis considered several factors to ensure data quality:

- The net monthly income was limited to 25,000 RON (5,060 Euro) during the tests due to statistical relevance.
- A maximum of 16 hours worked per day was considered relevant for the tests.
- All amounts are expressed in Euro, using the exchange rate between Euro and Romanian Lei (RON) on November 17th, 2021 (1 RON = 4.94 Euro), and represent either averages or medians, as appropriate, of net monthly earnings.
  The average hourly rate describes the income earned by a graduate in one hour's work, based on a 40-hour week and 21 working days per month.

2.4. Research Questions

The study aims to explore various characteristics and outcomes of first-generation graduates, with a focus on their educational journey and transition to the labour market. It is hypothesised that the fact these graduates' parents had not studied at the post-secondary level significantly impacts their academic and post-graduation experiences (Hesketh and Brown 2004). To shed light on this issue, three research questions were considered.

- RQ1: Are there significant social and economic differences between first-generation graduates and their peers?
- RQ2: What disparities exist between first-generation graduates and their peers whose parents have attained higher education, particularly regarding their perceptions of personal and experiences during their studies and their transition into the labour market?
- RQ3: If there are indeed variations, how long do they tend to last? Do they have significant implications in the short or medium term?

The aim of this research is to investigate the relationship between educational attainment, socio-economic background, and professional trajectories, with a particular focus on first-generation graduates. The study will provide insights into the employment outcomes of this group, aiming to identify the main factors contributing to their professional success. Although it is premature to assess the efficacy of potential institutional measures within the Romanian policy framework due to limited data, the study discusses national state of art ahead the Ministry of Education's upcoming initiative to implement a specialized support scheme for first-generation students (Ministry of Education 2023).

3. Results

3.1. Characteristics of first-generation students

Both first-generation graduates and their peers have a higher percentage of females than males. Among first-generation graduates, 63.5% are females, while among their peers, the percentage is 4.8% lower (58.7%). Additionally, only 22.2% of non-first-generation graduates reside in rural areas, while 37.1% of their peers with less educational attainment within their parents' group live in rural areas. First-generation graduates are typically older than those whose parents have higher levels of education. This age difference has increased over time for both bachelor's (from 0.17 years in 2016 to 0.66 in 2020) and master's degree holders (from 0.47 years in 2016 to 0.81 years in 2020). This suggests that first-generation graduates often do not pursue higher education immediately after completing secondary school and are more likely to be mature students.

				Residence - environment (rural/urban)					
				Urban			Rural		
				Count	Column N %	Row N %	Count	Column N %	Row N %
First-generation graduate	No	Gender	Male	1278	41.4%	97.2%	37	43.7%	2.8%
			Female	1813	58.6%	97.4%	48	56.3%	2.6%
	Yes	Gender	Male	1076	36.2%	96.0%	44	36.1%	4.0%
			Female	1893	63.8%	96.0%	79	63.9%	4.0%

Table 1. Average age and Baccalaureate score for first-generation graduates and their peers on study cycle, gender and residence environment[1].

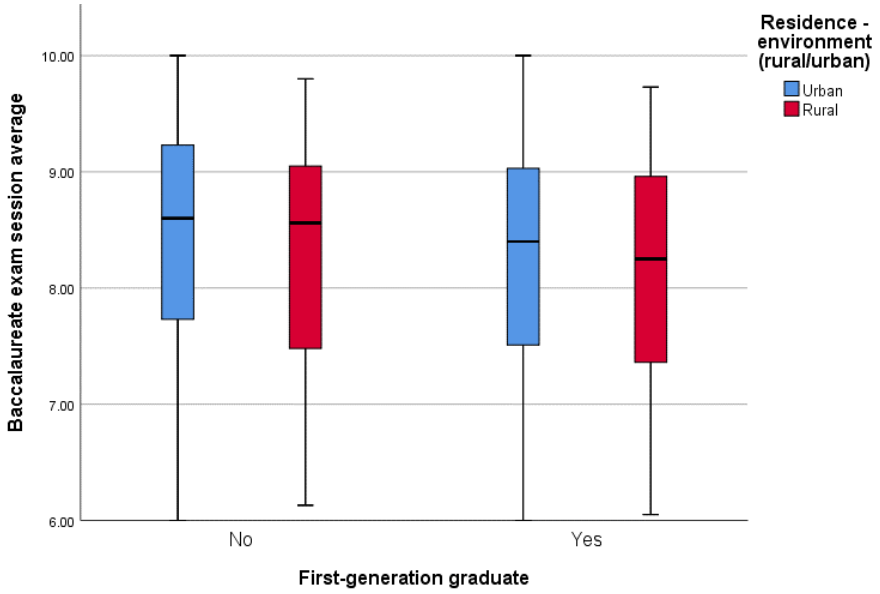
		First-generation graduates			
		No		**Yes**	
		Avg. age	**Avg. score BAC**	**Avg. age**	**Avg. score BAC**
2016 generation (T+5)	*Bachelor*	23.80	8.32	23.97	8.15

[1] The Baccalaureate, also known as *Bacalaureat* in Romanian, is a set of standardized exams taken at the end of high school in Romania. The exams are designed to assess the knowledge and skills acquired by students during their upper secondary education. The results of these exams are crucial in determining a student's eligibility for admission to Romanian universities in various study programs. Admission to universities requires possession of a Baccalaureate diploma.

		First-generation graduates			
		No		Yes	
		Avg. age	Avg. score BAC	Avg. age	Avg. score BAC
	Master	25.84	8.45	26.31	8.17
2020 generation (T+1)	*Bachelor*	24.00	8.52	24.66	8.28
	Master	26.94	8.39	27.75	8.30
Gender	*Male*	25.44	8.12	26.38	7.80
	Female	24.24	8.61	24.57	8.44
Residence - environment	*Urban*	24.71	8.46	25.61	8.25
	Rural	24.59	8.25	24.24	8.20

Significant disparities exist in the average scores on the upper secondary final examination (Baccalaureate) between first-generation graduates and their peers. These disparities are consistent across both study cycles and persist over time. For example, the differences among bachelor's degree graduates increased from 0.17 points in 2016 to 0.24 in 2020. However, among master's degree graduates, the difference decreased from 0.28 points in 2016 to 0.09 points in 2020. It's important to note that in Romania, the minimum average score required for higher education is 6, while the maximum score is 10, leaving a range of just 4 points. For bachelor's degree graduates, the differences can be as high as 6%. This is particularly significant in the Romanian context, where many higher education institutions use Baccalaureate scores as a basis for admission, negatively impacting first-generation graduates.

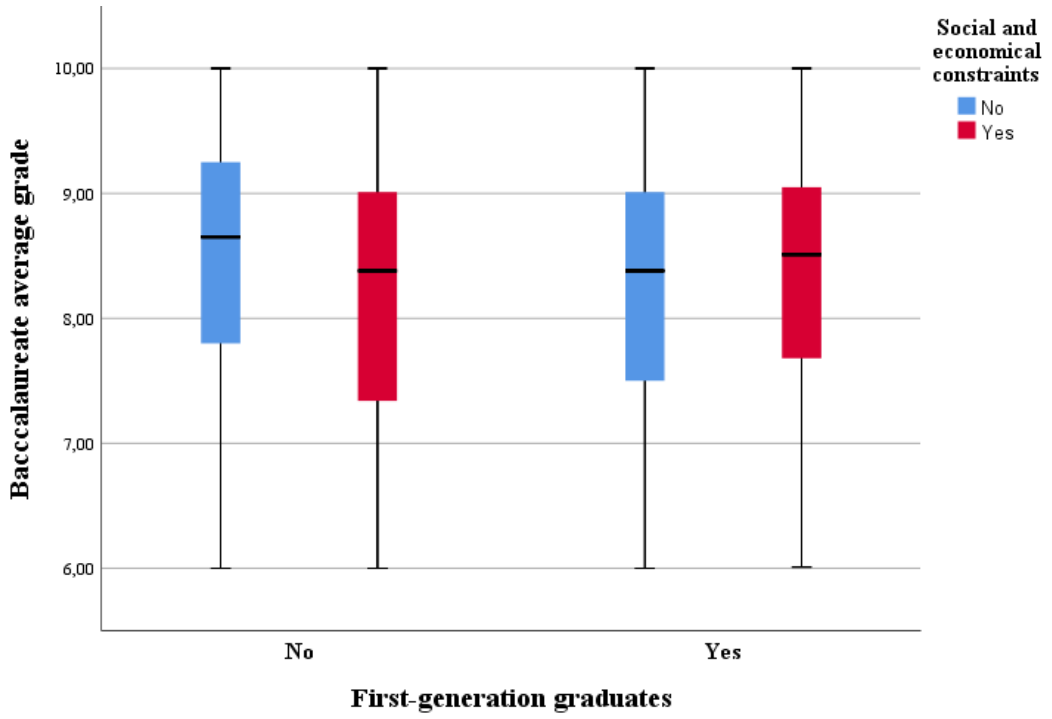
Figure 1. Baccalaureate average score distribution between first-generation graduates and their peers based on residence environment.



On average, male and female first-generation graduates are older than their peers by 0,94 and 0.33 years, respectively. Additionally, male first-generation graduates obtain an average score of 0.32 points less than

their colleagues with a higher education capital, while female, first-generation graduates obtain an average score of 0.17 points less than their peers on the upper secondary exam. The situation is similar when discussing female, first-generation graduates, who are, on average, 0.33 years older and achieve a lower score on the upper secondary exam by 0.17 points compared to their peers. It should be noted that there is a significant difference in the performance of first-generation graduates and their peers between rural and urban areas. In particular, the difference in Baccalaureate scores is 0.21 points in urban areas, compared to only 0.05 points in rural areas. Furthermore, the age difference is more pronounced in rural areas, with a gap of 1.37 years, compared to just 0.12 years in urban areas.

Figure 2. Baccalaureate average score distribution between first-generation graduates and their peers with social and economic constraints.



The analysis compared the differences between first-generation graduates and their peers based on residency using the Local Human Development Index (LHDI). Sandu (2011) developed this index, which was later expanded by Ionescu-Heroiu et al. (2014) to measure community capital in terms of human, health, vital, and material factors. Data from the 2011 census assessed nearly all administrative units in Romania. The data's age is still relevant for the two cohorts of graduates surveyed, who began their higher education studies no later than 2017 (for bachelor's degrees) and 2018 (for master's degrees). The LHDI methodology categorises administrative units into six types: communities of comprehensive poverty, poor-young communities, poor-old communities, middle development communities, communities of structural poverty, and communities of comprehensive development.

The percentage of first-generation graduates from communities of comprehensive poverty (0.7%) is more than double that of their peers (0.3%), though both values are small. This pattern is also observed in poor young communities (5.2% compared to 2.5%) and poor old communities (3.8% compared to 2.1%). First-generation graduates are more prevalent in middle development communities (20.2% compared to

13.2%) and communities of structural poverty (5.5% compared to 2.7%). However, the proportion of first-generation graduates residing in communities of comprehensive development is significantly higher in the case of graduates with more educated parents (79.2% compared to 64.6%).

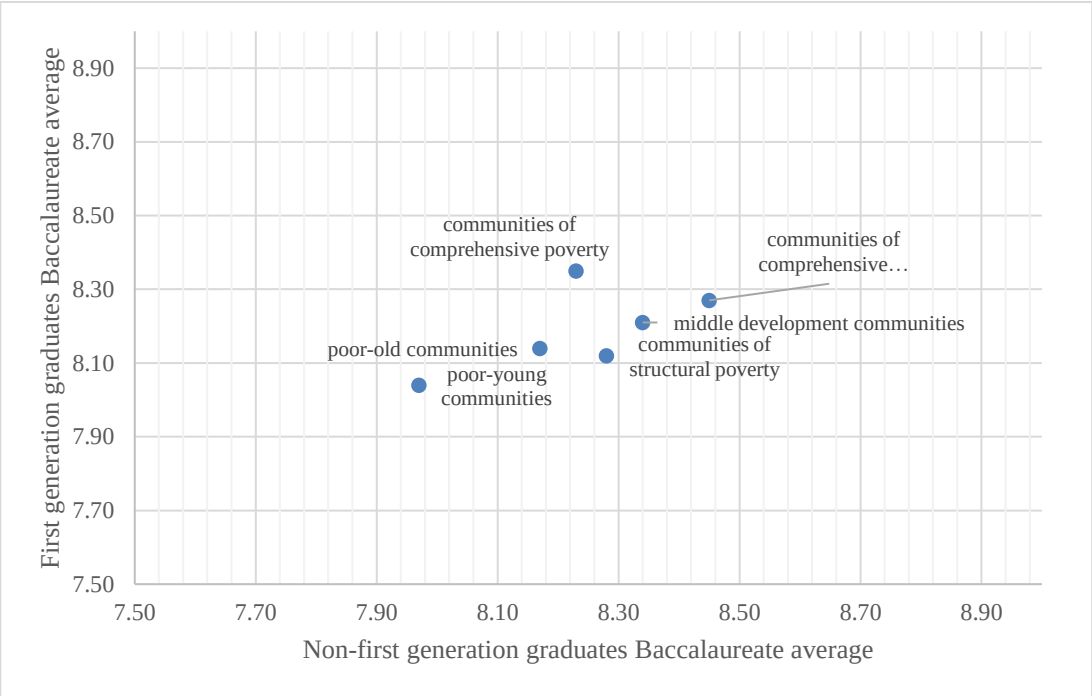
The data reveals a higher representation of first-generation graduates in communities characterized by poverty and underdevelopment compared to their peers from more educated families. 71.0% of students living in communities of comprehensive poverty, 66.8% of students in poor young communities, and 63.9% of students from poor old communities are first-generation graduates. although most individuals in both groups come from communities with comprehensive development, first-generation graduates are less concentrated in such areas, indicating a wider socio-economic distribution compared to their non-first-generation counterparts.

Table 2. Average Baccalaureate exam scores of first-generation graduates and their peers from precarious social and economic backgrounds.

	Precarious social and economic status			
	Yes		*No*	
	First-generation graduate		**First-generation graduate**	
	Yes	*No*	*Yes*	*No*
Baccalaureate exam session average	8.31	8.19	8.21	8.44

Economically disadvantaged first-generation graduates tend to perform better academically in pre-university education than those with a more favourable personal situation. One possible reason for this could be the awareness of financial constraints that put additional pressure on students to succeed, as education holds the key to a better future for themselves and possibly their families. This could be a significant factor. Additionally, students from socioeconomically comfortable backgrounds may not feel the same urgency to excel. They could rely on family connections or social advantages instead of focusing on educational attainment.

Figure 3. Scatterplot on the average Baccalaureate score of first-generation graduates and the Local Human Development Index typologies based on the graduates' residence.



Conversely, the opposite trend is observed for students who do not come from a disadvantaged social and economic background. Students from families with a history of higher education are more likely to receive guidance on preparing for high-stakes exams, understand assessment expectations, and develop effective study habits tailored to enhance their educational levels. First-generation students may lack familiarity with the norms and expectations of educational environments, while pupils with parents who attended university have an advantage.

3.2. Educational Access: Housing, Financial Support, and Study Fields

Compared to their peers, first-generation graduates are more likely to relocate from their birthplace, with 59.3% doing so. Additionally, 8.7% of first-generation graduates received student housing, which is 1.5 times higher than their colleagues with parents with a higher educational attainment (5.7%).

As government funding represents a significant source of financial support for university students, it is worth noting that first-generation graduate students are more likely to receive funding for their studies (85.4% compared to 82.7%). For example, in 2022, 64.64% of bachelor's degree students and 76.89% of master's degree students in public universities did not pay tuition fees as they were admitted on a government-funded study place. This subsidy covers the tuition fee. Students may also be eligible to apply for academic or social scholarships, but these are not automatically granted. It is important to consider that the admission process in higher education is based mainly on academic criteria. Therefore, the determination and resilience of first-generation graduate students during their studies should be acknowledged. it is to be underlined their determination and resilience during higher education studies.

The percentage of first-generation graduates who have to pay tuition fees is 38.5% lower than that of previous students who had a precarious social and economic status. When referring to government-funded study places, there are no significant differences between first-generation students and their peers.

				First-generation graduate					
				No			Yes		
				Count	Row N %	Column N %	Count	Row N %	Column N %
Form of financing university studies	Government funding	Precarious social and economic status	No	2445	50.2%	87.6%	2420	49.8%	88.0%
			Yes	347	51.2%	12.4%	330	48.8%	12.0%
	Tuition fee	Precarious social and economic status	No	518	54.4%	88.7%	434	45.6%	92.3%
			Yes	66	64.7%	11.3%	36	35.3%	7.7%

The data indicates that first-generation graduates tend to pursue study fields such as *Engineering, manufacturing, and construction* (+4.6%), *Education* (+1.8%), or *Natural sciences, mathematics, and statistics* (+1.6%). In contrast, study fields such as *Health and welfare* (-5.8%) or *Information and Communication Technologies* (-0.6%) are less represented among graduates from families with lower educational capital. Notably, a considerable proportion of first-generation students successfully complete their academic programs within the stipulated timeframe. However, the difference in graduation rates between this group and their non-first-generation peers is marginally significant, with the former trailing behind by a mere 1.1%. Despite this, both categories have a high representation, with over 90% of graduates completing their studies on time.

Table 3. Distribution of study fields (ISCED-F), financial support structures, dormitory residency and timeliness of graduation among first-generation graduates compared to peers.

		First-generation graduates	
		No	**Yes**
Study field ISCED-F	*Education*	3.8%	5.6%
	Arts and humanities	10.8%	10.3%
	Științe sociale, jurnalism și informare	10.7%	10.2%
	Business, administration and law	23.4%	22.9%
	Natural sciences, mathematics and statistics	6.3%	7.9%
	Information and Communication Technologies	2.7%	2.0%
	Engineering, manufacturing and construction	23.2%	27.8%
	Agriculture, forestry, fisheries and veterinary	4.6%	4.4%
	Health and welfare	14.7%	8.9%
	Government funding	82.7%	85.4%

		First-generation graduates	
		No	Yes
Form of financing university studies	*Tuition fee*	17.3%	14.6%
Dormitory resident	*Not a dormitory resident*	94.3%	91.3%
	Dormitory resident	5.7%	8.7%
On-time graduation	*No*	7.2%	6.1%
	Yes	92.8%	93.9%

3.3. Student experiences: shaping personal and professional identity

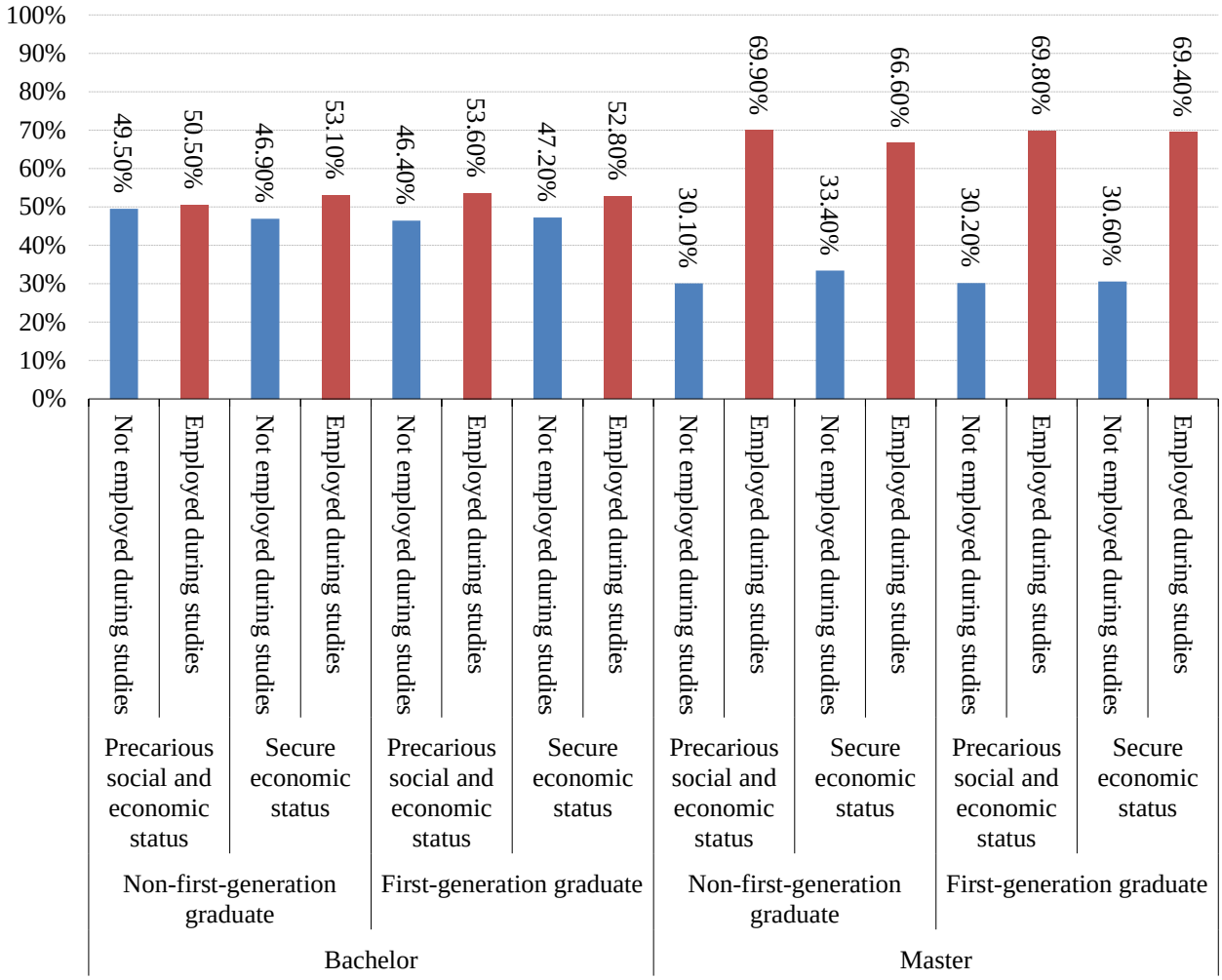
Chi-square tests reveal a statistically significant correlation between first-generation graduates and increased participation in internships, volunteering, and external mobility programmes. Although the level of correlation is modest, it strongly suggests that first-generation students are more likely to proactively seek out these skill-building activities than their non-first-generation peers. Further research may reveal possible factors contributing to this increased engagement, such as a unique drive to compensate for a lack of existing professional networks or different student life experiences.

Table 4. Chi-Square tests results concerning first-generation graduates' profile and different personal and professional experiences during studies.

Variable Compared with First-Generation Graduate	Chi-Square (χ^2)	Degrees of Freedom (df)	p-value	Phi/Cramer's V
Internships	17.352	1	.000	.051
Volunteering Activities	8.836	1	.003	.037
External Mobility or Internships	31.813	1	.000	.069

When graduates were asked about their perceptions of the role of education (with a score of 2.53) and university prestige (with a score of 3.27) in employment, using a Likert scale ranging from 1 to 5 (with 1 being very little and 5 being very much), it was found that there were no discernible differences between the mean scores of first-generation graduates and their peers.

Both first-generation bachelor's graduates (53.5%, compared to 50.8% for their peers) and master's graduates (69.8% compared to 69.4%) were more likely to work during their studies. However, the differences between these categories were minimal, suggesting that the underlying reasons for the high proportion of working students, primarily undergraduate students, may differ. Nor is it a matter of precarious social and economic status. The proportions of students facing financial constraints, whether they are first-generation graduates, are similar in terms of employability during their studies. However, first-generation students, especially if they don't have a secure economic status, are more likely to work during their studies.



						Precarious social and economic status					
						No			Yes		
						Count	Row N %	Column N %	Count	Row N %	Column N %
Study cycle	Bachelor	First-generation graduate	No	Employment rate during studies	not employed	961	88.9 %	49.5%	121	11.1 %	46.9%
					employed	979	87.8 %	50.5%	136	12.2 %	53.1%
			Yes	Employment rate during studies	not employed	871	88.4 %	46.4%	114	11.6 %	47.2%
					employed	1007	88.7 %	53.6%	128	11.3 %	52.8%

					Precarious social and economic status					
					No			Yes		
					Count	Row N %	Column N %	Count	Row N %	Column N %
Master	First-generation graduate	No	Employment rate during studies	not employed	308	85.5 %	30.1%	52	14.5 %	33.4%
				employed	714	87.3 %	69.9%	104	12.7 %	66.6%
		Yes	Employment rate during studies	not employed	295	88.6 %	30.2%	38	11.4 %	30.6%
				employed	682	88.8 %	69.8%	86	11.2 %	69.4%

3.4. Transition and labour market insertion

3.4.1. Perception versus reality: job market entry and recruitment

Although first-generation graduates perceive the transition to the labour market as slightly easier (2.33 compared to 2.36 for their peers on a 5-point Likert scale), they experience greater difficulty in securing a job more challenging to find a job (2.87 vs. 2.77). Their perceptions of how the labour market works contradict the reality of their difficulties in finding a job.

First-generation graduates are significantly less likely to find jobs directly from employers (-36.94%), family businesses (-27.59%), work placements (-23.33%), or through pre-university teaching certification (-18.20%) compared to peers with parents holding higher education degrees. They rely more heavily on social more heavily on social networks (+27.27%), self-employment (5.68%), and university-related services (e.g., career counselling, job fairs +4.38%) than their peers.

Table 5. Recruitment channels and the distribution of the first-generation graduates (and their peers) within and between the same categories.

	Distribution of graduates within the same category			**Distribution of graduates between categories**		
	Non-first-generation graduates	**First-generation graduates**	**Difference (%)**	**Non-first-generation graduates**	**First-generation graduates**	**Difference (%)**
	(A)	*(B)*	*(B) – (A)*	*(C)*	*(D)*	*(D) – (C)*
Job fairs	26,10%	30,20%	4,10%	47,96%	52,04%	4,08%
Family or friends	20,40%	22,70%	2,30%	48,91%	51,09%	2,18%
Internship	15,90%	15,20%	0,70%	47,16%	52,84%	5,68%
Own business	5,60%	6,70%	1,10%	47,81%	52,19%	4,38%

	Distribution of graduates within the same category			Distribution of graduates between categories		
	Non-first-generation graduates	**First-generation graduates**	**Difference (%)**	**Non-first-generation graduates**	**First-generation graduates**	**Difference (%)**
National tenure examination in pre-university education	8,00%	5,90%	-2,10%	48,16%	51,84%	3,67%
University (e.g. career counselling and guidance centre, teachers)	4,40%	5,10%	0,70%	36,36%	63,64%	27,27%
Private agency	4,00%	4,50%	0,50%	51,61%	48,39%	-3,23%
Direct via employer	7,20%	3,50%	-3,70%	52,54%	47,46%	-5,08%
Family business	5,00%	3,00%	-2,00%	75,00%	25,00%	-50,00%
Public employment agency	1,10%	1,00%	-0,10%	61,67%	38,33%	-23,33%
Work placements during university studies	1,20%	0,80%	-0,40%	52,78%	47,22%	-5,57%
Social networks	0,40%	0,70%	0,30%	63,79%	36,21%	-27,59%
Residency (in-hospital training))	0,50%	0,50%	0,00%	59,10%	40,90%	-18,20%
Recruitment websites	0,20%	0,10%	-0,10%	68,47%	31,53%	-36,94%

As a result, first-generation graduates have taken fewer direct routes to employment and are less likely to get their jobs directly from employers, family businesses, or work placements during their studies. They are more likely to rely on other routes, such as social networks, self-employment, or university services. However, more than a third of first-generation graduates found jobs through job fairs (30.20%). Also, one in five first-generation graduates found a job through family or friends (22.70%). The above-mentioned are their leading recruitment channels, followed by internships (15.2%) or setting up their own business (6.70%).

3.4.2. Employment and employability: disparities in job quality for first-generation graduates

While employment rates for first-generation graduates and their peers may be similar, a stark difference emerges in the quality of employment. Over a third (32.0%) of first-generation graduates with bachelor's degrees find themselves underemployed – in jobs not requiring their full qualifications - compared to just 23.9% of their peers. This highlights a crucial issue: the quality of employment is lower for this group.

Table 6. Distribution of first-generation graduates (and their peers) with different variables concerning employment.

				First-generation graduate	
				No	Yes
Study cycle	Bachelor	Employed/not employed	*not employed*	14.9%	17.5%
			employed	85.1%	82.5%
		Vertical mismatch	*No*	76.1%	68.0%
			Yes	23.9%	32.0%
		Self-employed (yes/no)	*No*	91.7%	94.5%
			Yes	8.3%	5.5%
		Coordination role	*No*	65.9%	64.8%
			Yes	34.1%	35.2%
	Master	Employed/not employed	*not employed*	9.3%	9.1%
			employed	90.7%	90.9%
		Vertical mismatch	*No*	77.7%	73.3%
			Yes	22.3%	26.7%
		Self-employed (yes/no)	*No*	92.2%	94.3%
			Yes	7.8%	5.7%
		Coordination role	*No*	61.6%	63.6%
			Yes	38.4%	36.4%

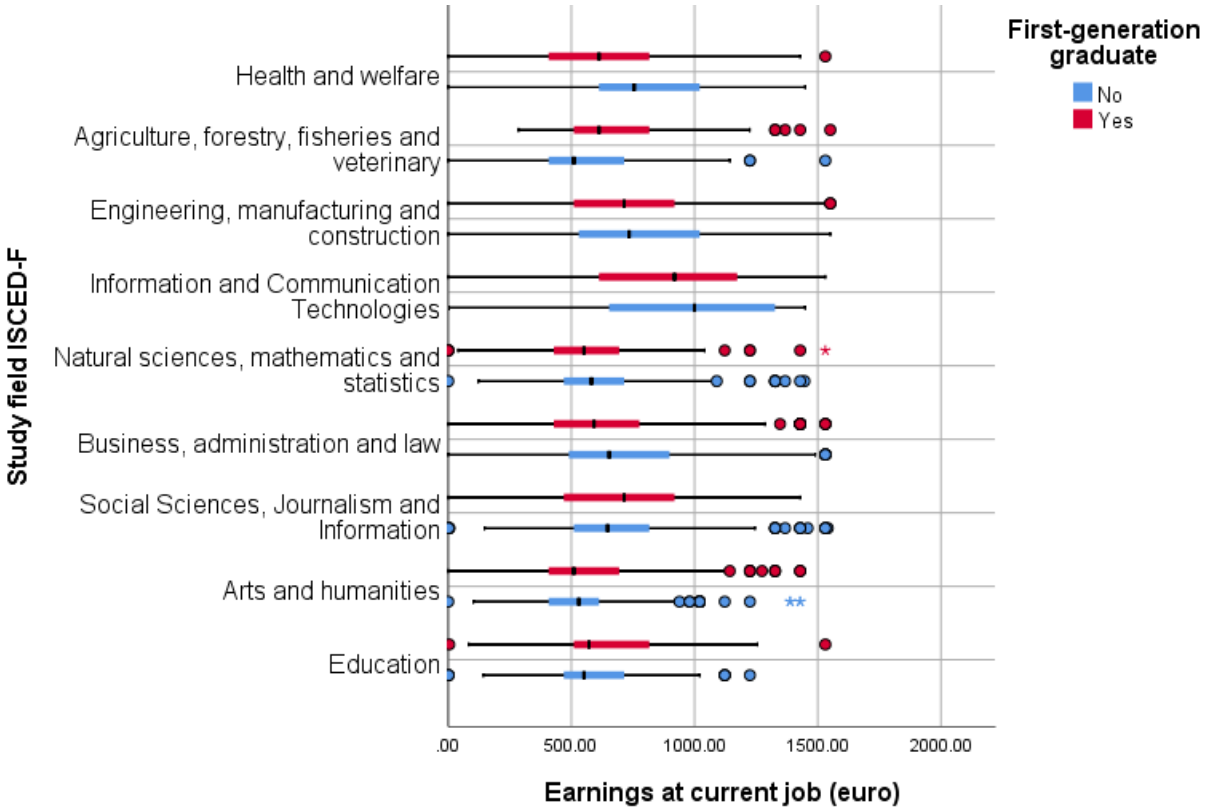
First-generation graduates face a significant income disadvantage compared to their peers with more educated parents. This is true for both Bachelor's and master's graduates. The survey results reveal a significant income gap between first-generation graduates and their peers. For bachelor graduates, this gap translates into an average income difference of 92.4 euros per month. First-generation bachelor graduates earn between 7.7% and 12.0% less than their peers, with the average disadvantage decreasing from 10.7% in the short term (T+1) to 7.7% in the medium term (T+5), depending on the cohort. This trend continues for master's graduates, where the earnings gap is higher at 8.2% (T+1) but decreases in the medium term to an average of 7.9% (T+5).

Table 7. Present mean and median earnings per month (at the moment of the survey) of first-generation graduates (and their peers).

			First-generation graduate			
			No		Yes	
			Mean	Median	Mean	Median
Cohort	2016 (T+5)	Bachelor	949.6	775.5	876.5	714.3
		Master	1,027.6	816.3	946.7	734.7
	2020 (T+1)	Bachelor	749.6	612.2	659.5	551.0
		Master	795.9	653.1	730.4	612.2
	General	Bachelor	868.8	714.3	776.4	612.2
		Master	927.6	714.3	847.6	673.5

Both fields of study and first-generation status play a role in the observed income differences. First-generation status leads to the situation here. They tend to earn less even in the same field of study (*Health and Welfare, Engineering, Manufacturing and Construction, Information and Communication Technologies or Business Administration, and Law*). This could be due to less access to high-paying networks with specific job titles or differences in job strategies or negotiation skills (Demetriou, et al. 2017). Other potential biases could arise from recruitment practices. Also, specific fields of study have lower average earnings (*Education*, *Arts and Humanities*, *Social Sciences, Journalism, and Information*) than others (*Engineering, manufacturing and construction* or *Information and Communication Technologies*) (DG EAC 2020). Social pressures that steer certain groups towards traditionally 'safe' careers could also contribute for a greater prevalence of the graduates within this study fields (Covarrubias, et al. 2019).

Figure 4. Clustered boxplot of earnings at current job (euro) by study field ISCED-F by first-generation graduate (without extreme maximal values above 1.571 Euro).

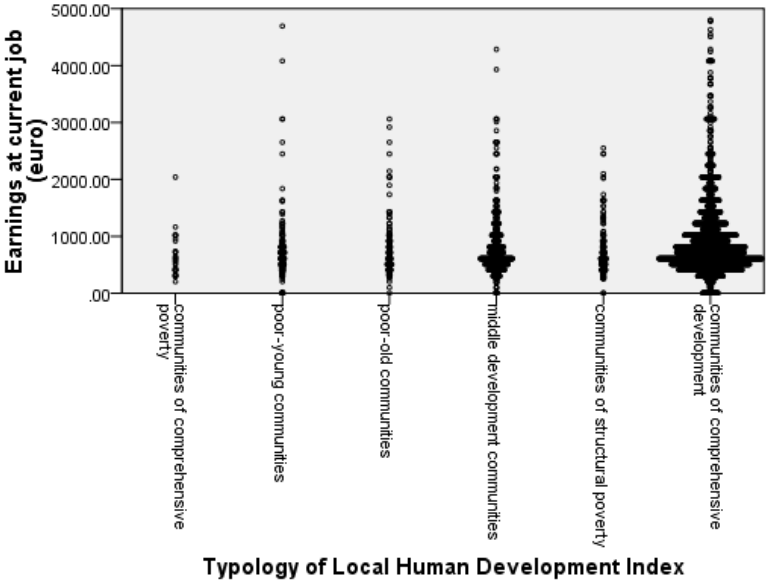


Another possible explanation for their comparatively lower earnings could be a higher rate of vertical mismatch among first-generation graduates, especially in fields with lower earnings potential, such as *Education* or *Business Administration and Law*. Interestingly, *Education* is the only field of study where graduates who experience vertical mismatch who experience a vertical mismatch in terms of occupation earn more than those who are matched according to their qualifications. In addition, significant

differences in earnings of vertically mismatched graduates are observed in high earnings fields such as *Information and Communication Technologies* and *Health and Welfare*.

Nonetheless, upon applying the LHDI typology to graduate earnings, it becomes apparent that those from *communities of comprehensive development* have significantly higher earnings compared to their peers from *communities of comprehensive poverty* or *structural poverty*. It is important to note that first-generation graduates are more likely to come from these areas with lower earnings potential.

Table 8. 2-D dot plot between earnings at the current job and the typology of LHDI for residence of graduates (before their studies).



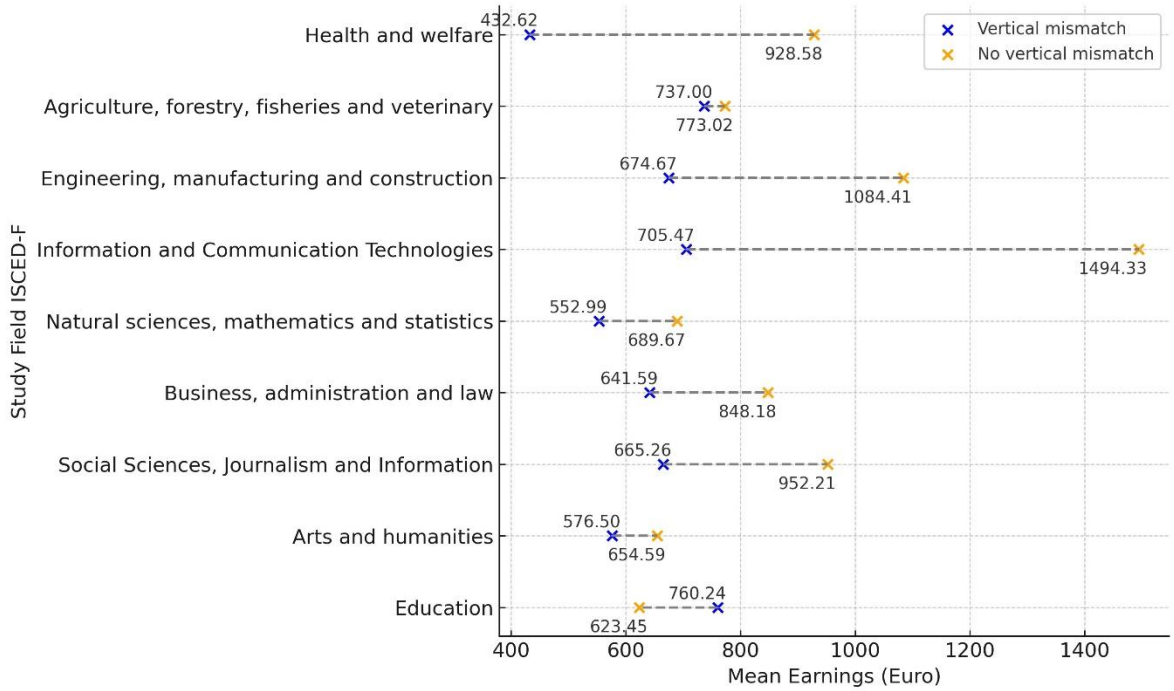
First-generation graduates are less likely to be self-employed at both levels of education. This could imply limited access to start-up capital or business networks and less exposure to family role models in entrepreneurship (Ghazzawi 2010). It may also reflect their reference to the perceived stability of traditional employment routes (Hirudayaraj and McLean 2018). The fact that first-generation graduates appear as likely as their peers to be in managerial or executive positions and are only marginally disadvantaged at the master's level underlines that developing appropriate skills is one of the most important ways to succeed in coordinating roles. Both first-generation graduates and their peers take around a year to land their current position; therefore, job search experience in terms of duration is not a primary differentiating factor between these groups.

In conclusion, while first-generation graduates may achieve employment rates comparable to their peers, these data reveal a persistent gap in the quality of their employment and their long-term earning potential. They face underemployment, a significant earnings gap even within the same sectors, and are over-represented in sectors with lower average salaries. These findings illustrate that being a first-generation graduate poses specific challenges in the labour market beyond the disadvantages often associated with socio-economic background alone.

3.4.3. Further focus on vertical mismatch and skills

Regarding the differences between the earnings of overqualified and their peers within various fields of study, it can be noticed that in the case of *Information and Communication Technologies*, the surplus is 788.86 euros per month (+111.82%). Less than 40% of graduates in ICT are the first in their family, while also within these graduates, the vertical mismatch is the lowest (6.6%). Also, in the case of *Health and welfare*, where students with a vertical occupational mismatch receive an income every month that is 114.64% higher than that of their peers, there is a small percentage of overqualified graduates (9.6%), as well as the lowest percentage of first-generation graduates (35.3%). Where average differences are lower, such as in fields of study such as *Education* (+21.94%) or *Arts and humanities* (+13.54%), the proportion of first generations is higher (58.0% and 49.6% respectively). The vertical mismatch within graduates is also higher, at 25.4% and 29.9% in the two fields respectively.

Figure 5. Mean monthly earnings distribution amongst vertical mismatched graduates and their colleagues compared to study fields (ISCED-F 2013).



On the one hand the data support the conclusion that there is an association between first-generation status and vertical mismatch, particularly with low levels of overqualified graduates. This could be due to some unique barriers that first-generation non-graduates face from admission onwards, such as a high level of competition and additional training or prior knowledge of the medical university system (Mason, et al. 2022), as "admission isn't access" for such students (Mason, Winseman and Ayala 2021).

On the other hand, in fields with higher mismatch rates (such as *Education* or *Arts and Humanities*), where there are significantly more first-generation graduates, it is still debatable whether they are attracted to these fields by factors such as perceived job security or cultural expectations. Is this mismatch a matter of self-selection, or is there less selectivity in recruitment in these fields? It could also be a 'deliberate mismatch', as graduates may pursue them because they do not fully match their degree but offer an initial

earnings advantage over 'proper' entry-level jobs. It is essential to contextualise the conclusions within the framework of the national labour market and the post-Covid-19 landscape, which led to significant disruptions in occupational profiles (Buda 2020, Anghelache, et al. 2022). Such an approach ensures a more nuanced and comprehensive understanding of the implications of these conclusions.

Table 9. Vertical mismatch and first-generation graduates' distribution among study fields (ISCED-F 2013).

	Vertical mismatch		**First-generation graduates**	
	No	**Yes**	**No**	**Yes**
Education	74.6%	25.4%	42.0%	58.0%
Arts and humanities	70.1%	29.9%	50.4%	49.6%
Social Sciences, Journalism and Information	67.3%	32.7%	50.9%	49.1%
Business, administration and law	60.4%	39.6%	53.1%	46.9%
Natural sciences, mathematics and statistics	73.8%	26.2%	46.9%	53.1%
Information and Communication Technologies	93.4%	6.6%	61.9%	38.1%
Engineering, manufacturing and construction	79.4%	20.6%	45.6%	54.4%
Agriculture, forestry, fisheries and veterinary	65.9%	34.1%	52.3%	47.7%
Health and welfare	90.4%	9.6%	64.7%	35.3%

The table below presents a comparative analysis of professional skills between first-generation graduates and their peers. The findings indicate that first-generation graduates rate their professional, foreign language, and IT skills slightly higher than their peers. This self-assessment suggests that first-generation graduates are actively working to improve their skill sets, possibly to compensate for the lack of support from their family background. However, the differences between the two groups are minor, suggesting that HEIs provide a similar level of education to both groups. The data also highlight the importance of self-perceived competence in vocational skills, which can be crucial in the transition to the labour market.

Table 10. Skills self-perspective of first-generation graduates (and their peers).

		First-generation graduate	
		No	Yes
(r) Professional skills specific to the field	-	5.1%	6.2%
	Neutral	17.2%	19.1%
	+	77.7%	74.7%
(r) Communication skills	-	1.6%	2.0%
	Neutral	12.7%	12.5%
	+	85.6%	85.4%
(r) Teamwork skills	-	1.4%	0.9%
	Neutral	7.9%	7.5%
	+	90.6%	91.5%
(r) Foreign language skills	-	6.1%	10.7%

	Neutral	21.4%	27.7%
	+	72.5%	61.6%
	-	1.4%	1.2%
(r) Problem solving skills	Neutral	9.3%	10.6%
	+	89.3%	88.2%
	-	2.6%	2.1%
(r) Basic IT skills	Neutral	10.7%	13.2%
	+	86.7%	84.7%
	-	40.0%	41.8%
(r) Advanced IT skills	Neutral	24.0%	27.4%
	+	36.0%	30.8%
	-	3.8%	3.4%
(r) Planning and organisational skills	Neutral	13.6%	14.7%
	+	82.6%	82.0%

4. Discussion and conclusions

Analysis of the CNAAIS provides a deeper understanding of first-generation graduates' educational process and employment prospects. This data is very valuable, as it offers insight into the career paths of these graduates. First-generation graduates are more likely to choose fields of study with lower earning potential and higher vertical mismatch. This trend may be related to a lack of cultural capital, which can impact their ability to gain admission into higher education programs. These students may not receive adequate career counselling, struggle to choose study programmes and may not be well-equipped to integrate into the academic environment.

4.1. Concerning the characteristics of first-generation students

There is a significant gender gap among first-generation graduates, with women over-represented, particularly in rural areas. Female graduates of the first generation are over-represented in rural areas in all development regions except one, with percentages 70% in at least two development regions. This over-representation could be related to specific socio-economic disadvantages faced by women in rural areas (Wiborg 2001), as well as to possible cultural expectations that hinder women's educational progress (Ballenger 2010).

Graduates who are the first in their family are also slightly more likely to come from rural areas. Additionally, a larger proportion of first-generation graduates come from rural areas than their peers, potentially impacting their access to resources and opportunities for higher education (Fleming and Grace 2014). This rural-urban divide highlights the need for policies addressing the unique challenges rural students face in accessing higher education. Policies aimed at improving educational infrastructure, providing scholarships and support systems, and raising awareness of higher education opportunities in these communities could play a crucial role in reducing the gender gap and urban-rural divide among first-generation graduates.

		First-generation graduate					
		No			Yes		
		Count	Column N %	Row N %	Count	Column N %	Row N %
Residence - environment (rural/urban)	Urban	3101	97.3%	51.0%	2979	96.0%	49.0%
	Rural	86	2.7%	41.1%	123	4.0%	58.9%

		First-generation graduate							
		No				Yes			
		Residence - environment (rural/urban)				Residence - environment (rural/urban)			
		Urban		Rural		Urban		Rural	
		Count	Column N %	Count	Column N %	Count	Column N %	Count	Column N %
Residence - development region (NUTS3)	Nord-Est	543	21.0%	20	29.3%	731	28.8%	38	38.7%
	Sud-Est	275	10.6%	14	21.2%	283	11.2%	5	4.6%
	Sud-Muntenia	247	9.5%	16	23.5%	284	11.2%	16	16.0%
	Sud-Vest Oltenia	187	7.2%	2	3.2%	188	7.4%	13	13.7%
	Vest	198	7.6%	7	10.1%	167	6.6%	7	6.7%
	Nord-Vest	549	21.2%	7	10.4%	437	17.2%	12	12.2%
	Centru	322	12.4%	2	2.3%	290	11.4%	6	6.2%
	București-Ilfov	270	10.4%	0	0.0%	155	6.1%	2	2.0%

First-generation graduates are generally older than their peers, suggesting they may have delayed entering higher education. First generation graduates are older at the time of graduation than their peers from more educated families. This is true for both cohorts and both cycles (Bachelor: 0.17 and 0.65 years, Master: 0.47 and 0.77 years). The difference in age is likely to be due to factors such as delayed entry into higher education caused by financial pressures or the need to work before committing to study, as is the case in other countries (Wells and Lynch 2012, Engle 2007). As a result, flexible education pathways that accommodate mature students are crucial.

					First-generation graduate	
					No	Yes
					Mean	Mean
Study cycle	Bachelor	Cohort	2016	Age (at the moment of graduation)	28.80	28.97
			2020	Age (at the moment of graduation)	24.99	25.64
	Master	Cohort	2016	Age (at the moment of graduation)	30.84	31.31

	2020	Age (at the moment of graduation)	27.97	28.74

	First-generation graduate	
	No	Yes
	Mean	Mean
Age (at the moment of graduation)	27.99	28.25

There is a consistent gap in uppers secondary final exam (Baccalaureate) scores between first-generation graduates and their peers, with previous scoring lower in Romania. This gap is particularly important as it influences university admission and subsequent choice of study programmes. In addition, first-generation male graduates score lower and tend to be older than their peers. These factors suggest potential disadvantages that could have a negative impact on their educational and career paths.

First-generation graduates from economically disadvantaged areas tend to outperform their peers in pre-university education. This finding suggests higher levels of resilience or the effectiveness of support systems for economically disadvantaged students. In contrast, non-first-generation graduates from more affluent backgrounds often show lower academic achievement in Baccalaureate. This may reflect differing social pressures or expectations. I also demonstrate the relationship between socioeconomic background and academic achievement. Furthermore, graduates who are the first in their family to attend university are more likely to come from communities experiencing widespread poverty, which can have a detrimental effect on their educational attainment and future earning potential.

4.2. Concerning educational access and student experience

First-generation graduates exhibit greater mobility, with many opting to relocate from their birthplace, likely in search of better educational or employment prospects. They are also more inclined to reside in student housing, which could indicate a need for more financial resources or familial support to secure private accommodation. Government funding is an essential lifeline for a more substantial proportion of first-generation graduates, highlighting the significance of financial aid programs in supporting students who may not have access to other financial resources.

First-generation graduates tend to enrol in fields like *Engineering*, *Education*, and *Natural Sciences*, viewing these areas as pathways to upward social mobility or due to the availability of more funding opportunities. Particularly in the national context of Romania, such occupations as those from the above-mentioned study fields, such as teachers or engineers were traditionally respected especially in the region (Roșca and Fala 2009). In the absence of proper counselling services in pre-university education, limited counselling towards pupils from their families, if provided, may be subject to a distorted perspective due to their low level of educational attainment. This could lead to a mismatch between the candidate for higher education and the study program, as well as their expectations towards transitioning to the labour market. Conversely, *Health and Welfare* and *Information and Communication Technologies* are underrepresented among first-generation graduates, which may reflect their preferences, perceived barriers (e.g. admission is more difficult and requires additional training), or the influence of socioeconomic factors on their choice of study field.

Despite the challenges faced by first-generation students, such as potential financial hardship and the absence of familial academic guidance, their higher proportion among students receiving government funding and their successful completion rates reflect their determination and resilience in pursuing higher education. The slight difference in on-time graduation rates between first-generation and other students implies that while first-generation students face obstacles, they are still highly capable of academic success. The findings suggest that support services, such as financial aid, housing, and academic counselling, play a crucial role in the success of first-generation students. Higher education institutions and policymakers should consider developing targeted strategies to support first-generation students, particularly in providing information about study fields that lead to successful employment outcomes and ensuring equitable access to resources.

4.3. Concerning the personal and professional factors during studies

The empirical findings have revealed a noteworthy yet modestly positive correlation between first-generation graduates and their active participation in internships, volunteering activities, and external mobility programs. The Chi-Square test results have substantiated that first-generation graduates are more inclined to engage in internships and volunteering activities, with a Phi/Cramer's V value of 0.051 and 0.037, respectively, indicating a positive yet small association. Furthermore, the study has inferred a stronger correlation between first-generation graduates' participation in external mobility or internships, with a Phi/Cramer's V value of 0.069, which could suggest that these opportunities are more valued or sought after by these students.

The results also indicate that graduates, irrespective of being first-generation students or not, do not perceive a significant difference in the role of education and university prestige in employment. This finding could imply that all graduates view their educational achievements and the reputation of their university as similarly influential in securing employment. However, a slightly higher percentage of first-generation graduate's work during their studies at both the bachelor's and master's levels, which may suggest a need for financial support or a desire to gain professional experience concurrently with their academic studies.

The study observes minimal differences in work participation rates during their studies between first-generation graduates and their peers, which could point to a broader trend of students working while studying. This trend may be driven by factors other than just being a first-generation student, such as the economic climate or changing cultural expectations around work and study.

4.4. Concerning transition and labour market insertion

While first-generation graduates experience greater difficulty in securing a job, their perceptions of how labour market works seem to minimise these challenges. To compensate for lower levels of social capital, they rely more heavily on job fairs as a means of discovering opportunities.

Though first in family higher education graduates tend to have less social capital, they still find a significant proportion of employment opportunities through family and friends - a trend that appears to contrast with the wider emphasis on direct routes such as internships and employer contacts in the case of their peers with more educated parents. This reliance on close networks could reflect their strong community ties, the effectiveness of these networks, or a lack of access to the types of direct routes more common among their peers. It's important to note that first-generation graduates are less likely to secure

jobs directly through employers, family businesses or pre-existing internships. Instead, they make greater use of social networks, self-employment, and university services. Job fairs (30.20%), followed by family and friends (22.70%), remain their main recruitment channels.

As the unemployment rates for first-generation bachelor graduates and their peers may be comparable, there's an important distinction to be made. First generation graduates are significantly more likely to be underemployed – more than a third (32.0%) are in jobs that do not require their full qualifications, compared to 23.9% of their peers. This highlights a mismatch between their educational attainment and the job opportunities available to them, and indicates a greater challenge in securing employment that fully utilises their skills and qualifications. It may also reflect the fact that they have chosen their jobs mainly through job fairs and from families with lower social capital.

First-generation graduates face a persistent income disadvantage compared to their peers, earning significantly less at both bachelor's and master's level. It is important to note that this is a factual observation, not a subjective evaluation. While they are less likely to be self-employed, first-generation graduates may hold managerial positions at similar or slightly higher rates than their peers, especially at the bachelor's level. However, even with potential managerial positions, this doesn't compensate for the earnings gap. For bachelor graduates, the difference is 92.4 euros per month on average, representing a disadvantage of between 7.7% and 12.0%.

First-generation graduates often end up working in industries with lower average salaries, which further reduces their earning potential. They also experience a higher rate of vertical mismatch, especially in fields with lower earning potential, which affects their income. Surprisingly, in the field of *Education*, overqualified graduates earn more than their peers. Furthermore, graduates who are the first in their family to attend university often come from less developed communities, which can limit their earning potential. Additionally, they may face a 'deliberate mismatch' by choosing jobs outside their field of study for immediate financial gain.

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