

University dropout and its determinants: evidence from the University of Padova

L'abbandono universitario e le sue determinanti: il caso dell'Università di Padova

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Abstract

Literature on dropout highlights its multifactorial nature, driven by intertwined factors. This study examines this phenomenon at the University of Padova, focusing on students enrolled from the academic year 2016-2017 to 2023-2024. Using administrative data, students are followed throughout their academic career to examine the risk of dropping out as a function of individual and economic variables. The results of the Cox proportional-hazards regression models show that there are several aspects at play that differ according to the field of study. This suggests the need to implement strategies to support the academic experience and retention, considering the complexity of the phenomenon.

Keywords: university dropout; student retention; Cox proportional-hazards model.

Sintesi

La letteratura sul *dropout* universitario ne evidenzia la natura multifattoriale, determinata da un intreccio di diversi fattori. Lo studio proposto esamina il fenomeno dell'abbandono presso l'Università di Padova, concentrandosi sugli studenti iscritti dall'a.a. 2016-2017 al 2023-2024. Utilizzando dati amministrativi, gli studenti sono seguiti per tutta la loro carriera, analizzando il rischio di abbandono in funzione di variabili individuali ed economiche. I risultati dei modelli di regressione di Cox a rischi proporzionali evidenziano che ci sono diversi aspetti in gioco che differiscono a seconda del campo di studi. Ciò suggerisce l'importanza di implementare strategie per sostenere l'esperienza accademica e la permanenza degli studenti, considerando la complessità del fenomeno.

Parole chiave: abbandono universitario; permanenza degli studenti; modello di Cox.

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1. Dropout in higher education and related phenomena

The recent pedagogical debate is rich in reflections, research and in-depth studies concerning the issue of dropout in academia. In particular, the multifactorial nature of the phenomenon and its significant impact at both the individual and collective levels are widely recognized (Kehm et al., 2019; Véliz Palomino & Ortega, 2023).

However, these are complex dynamics, and summarizing their key features is not straightforward. In this contribution, in order to provide a common interpretative framework, we specify that university dropout is understood as an interrelated set of dynamics that –jointly– can hinder academic success.

University dropout is commonly described as the early abandonment of studies before obtaining a degree or as failure to enrol for a certain number of semesters (Rahmani et al., 2024; Skrbinek et al., 2024). However, such negative *outcomes* of the educational path are also linked to other related dynamics, which often precede or accompany the actual withdrawal: delays in passing exams or in writing the final dissertation, difficulties in adaptation, inadequate available resources, ineffective study methods, relational or personal difficulties. All these elements represent dynamics that are sometimes *hidden*, yet together they can lead to academic failure.

The university experience is, in fact, characterized by extreme complexity, and numerous factors may influence its progression and outcomes, as we will soon argue. Therefore, it is essential for the pedagogical debate to consider the multifactorial and multicausal nature of dropout when discussing this crucial issue.

Before delving deeper into these aspects, however, it should be specified that a prematurely concluded academic path does not necessarily indicate a *failed* path: in some cases, such a choice results from a positive *re-orientation*, leading the individual to more effective educational or professional experiences or to a realignment of their needs, goals, and expectations.

In this study, in order to shed light on the dropout phenomenon, students enrolled in first cycle degree courses at one of the largest public institutions in Italy, namely the University of Padova, are considered. Specifically, students enrolled from the academic year 2016-2017 to the academic year 2023-2024 are followed in their academic careers, focusing on their risk of dropout from the university. The use of administrative data allows to consider some of the determinants connected to withdraw: in particular, this study focuses on variables at the individual level (personal characteristics such as gender, type of secondary school and final grade, age of university enrolment and distance to university) and at the economic level (a measure of family economic situation).

The rest of the paper is organized as follows. Section 2 discusses the different factors influencing dropout and their dynamics. Section 3 presents the case study considered in this paper, with its strengths. Section 4 describes in detail data and methods used. Sections 5 and 6 present descriptive and multivariate results, respectively. A discussion of results and their implications concludes the paper.

2. Factors influencing the dynamics of student dropout

Addressing the issue of university dropout is not simple. However, despite a certain terminological ambiguity and multiple reflections that *mix* related concepts (such as

friction, withdrawal or non-completion), the literature agrees in considering dropout a challenge of primary importance on several levels, with numerous causes and effects that intertwine on the individual, economic, institutional and social level, and which lead to equally impactful consequences (Abdul-Rahaman et al., 2023; Aina et al., 2022; Ameen et al., 2019; Barroso et al., 2022; de la Cruz-Campos et al., 2023; Ghimire et al., 2024; Kehm et al., 2019; Lorenzo-Quiles et al., 2023; Meneses & Marlon, 2020; Skrbinjek et al., 2024; Zago et al., 2014).

In particular, in this study we focus on several individual and economic determinants that the literature has identified as relevant for university careers, including age, gender, secondary school background and economic conditions.

More specifically, student age is frequently explored in the scientific debate, with evidence suggesting that older students are more likely to dropout (Müller & Schneider, 2013; Contini & Salza, 2020), potentially due to increased opportunity costs and a generational mismatch that may hinder social integration (Chrysikos et al., 2017; Tinto, 1975). Gender differences have also been consistently reported, as men tend to drop out at higher rates than women (Aina, 2013; Arulampalam et al., 2004; Bound et al., 2010; Contini et al., 2018; Ghignoni, 2017; Perchinunno et al., 2021); these differences are often attributed to individual characteristics, such as motivation and time management skills, as well as to family responsibilities and labor market structure (Severiens & ten Dam, 2012; Stinebrickner & Stinebrickner, 2012). However, as reported by Zago and colleagues (2014), some studies state a higher risk of dropout for males compared to females, but also a higher likelihood of graduating for males (Arias Ortiz & Dehon, 2013; DesJardins et al. 2002).

Secondary school background and final grades have also been used as indicators of pre-college readiness, with research typically finding lower dropout rates among students from more academic-oriented institutions, such as high schools (known as “licei”, in the Italian school system), and among those with higher prior educational attainments (Contini et al., 2018; Contini & Salza, 2020; Vignoles & Powdthavee, 2009). For example, Ghignoni (2017) observed that students from vocational schools (“istituti professionali” in the Italian system) have a higher likelihood of dropping out, while Contini and colleagues (2018) reported that students from high schools exhibit considerably higher timely completion probabilities than those from technical or vocational schools.

On the other hand, also economic conditions and social class play a critical role on dropout rates. Numerous studies have shown that students from low socio-economic backgrounds, often measured by parental education and occupation, or by the socio-economic *status* of the family, face a higher risk of academic failure (Aina, 2013; Bozick, 2007; Contini et al., 2018; Vignoles & Powdthavee, 2009), partly because financial constraints may force them to work while studying, thereby reducing the time available for academic pursuits (Stinebrickner & Stinebrickner, 2012). This dynamic is further explained by theories of cultural reproduction (Bourdieu & Passeron, 1990) and rational action (Breen & Golthorpe, 1997), which suggest that students from higher socio-economic statuses tend to make more ambitious educational investments to minimize the risk of downward intergenerational mobility (see also Contini et al., 2018). Economic factors are, therefore, deeply intertwined with dropout rates. In this sense, the family’s economic resources could influence the students’ permanence, being an element to be taken into account when reflecting on dropout and on possible accompanying and support actions to prevent it.

Of course, other psychological, social, relational, didactic and institutional factors related

to the students' experience during university, including levels of engagement, participation, and support networks, are critical in determining academic success (Da Re, 2017; de la Cruz-Campos et al., 2023; Lorenzo-Quiles et al., 2023; Tinto, 2006). However, these factors that may contribute to dropout decisions are often challenging to measure empirically. Aware of that, also based on the available information, we decided to embrace in our study the scientific stimuli discussed above, recognizing that the individual and economical pre-entry characteristics (e.g. age, gender, socio-economic status, school preparation) play a crucial role in shaping students' academic trajectories, and could affect students' ability to persist in their studies.

3. The current study and its strengths

High levels of dropout and delayed completion in higher education have recently been observed in many countries. Indeed, recent data from Organization for Economic Cooperation and Development (OECD) member countries show that, on average, one in three students leaves university without a degree (OECD, 2022). The situation in Italy is particularly worrying. The recent increase in educational attainment has not closed the gap with other OECD countries. In fact, Italy remains at the bottom of the educational distribution. One reason for this is the high dropout rate and the other is the high delays in completing the university path (Aina et al., 2022). To study the Italian case, many studies have been carried out to identify the determinants of university careers (see, for example, Agrusti et al., 2020; Aina et al., 2022; Clerici et al., 2015; Ghignoni, 2017; Meggiolaro et al., 2017).

The growing literature on the Italian case, although rich in terms of methodological approaches (Agrusti et al., 2020; Belloc et al., 2011; Meggiolaro et al., 2017), is still fragmented from an empirical point of view: most of the studies have used rather outdated data and have not always examined the complexity of the university careers.

In order to shed light on the dropout phenomenon, this paper refers to students enrolled in first cycle degree courses at one of the largest public institutions in Italy, namely the University of Padova, from the academic year 2016-2017 to the academic year 2023-2024. For the study of students' careers, and in particular of dropouts, administrative data are used, which do not suffer from the problem of missing data that is often encountered in surveys due to reluctance to answer a particular question.

In addition to dealing with very recent data, the study also takes into account the complexity of university careers and focuses on dropout not only at the early stage of the university career. In fact, in Italy late completion and late dropout are interrelated phenomena that require attention. Some students take a long time to complete their studies, while others remain in the higher education system for many years before finally dropping out. Dropping out is therefore not a phenomenon limited to the first few years of enrolment but can also occur several years later. For this reason, it is not sufficient to follow students only for a limited period of time in order to have a full understanding of the phenomenon. Most previous studies have focused on the first year at the university or considered limited time intervals (e.g. Del Bonifro et al., 2020; Perchinunno et al., 2021), but it is in the interest of institutions to prevent dropout at all stages of the study pathway.

As already mentioned, the current study uses very recent data on all first cycle degree courses at the University of Padova, covering a long period of time, in order to take into account the complex and long process of dropout. In particular, it's very important to

distinguish between dropout from university and dropout from a degree course, focusing on students who have left university². Students who have left one programme and started another at the same institution could not be considered as dropouts. In fact, this does not represent a real failure for individuals and institutions: it may be a consequence of choosing a study programme for the wrong reasons or for not having received adequate guidance before entering university (Kehm et al., 2019). It is therefore important to take into account these specificities, which have not been addressed in most of the previous literature.

Also, compared to most previous studies (e.g. da Costa et al., 2018; Meggiolaro et al., 2017), that, due to data limitation, used discrete-time hazard models, this work takes into account the fact that students can withdraw at any time during the academic year, as the information on the exact date of such an event occurs is available.

With regard to the determinants of dropout, this study focuses on individual and economic level variables. Specifically, the variables at the individual level are the personal characteristics of the students and their educational background. Regarding the variables at the economic level, most of the literature investigating the impact of family characteristics on children's university careers has used parents' education and/or occupation as a proxy for economic status (see, for example, Contini et al., 2018). In the current paper, it's possible to rely on a precise measure of a family's economic status, namely a synthetic indicator of the household economic situation called ISEE (Indicatore della Situazione Economica Equivalente).

4. Data and methods

The dataset includes all the students enrolled in a first degree course at the University of Padova during the academic years from 2016-2017 to 2023-2024. The total sample consists of 99,011 students. The information provided by administrative sources is updated to 20 September 2024. Clearly, students from more recent cohorts have censored academic careers, meaning that the final event (dropping out or graduating) is not yet observed.

The administrative database of the University of Padova collects information on students' secondary education (irregularity of career, type of school attended and final examination results) and some personal characteristics (gender, age, year of university enrolment, place of residence, nationality, working condition and the presence of disability). Students are required to provide all this information at the time of their application. In addition, the data include follow-up information on each student's progress through the university. In particular, the exact timing of dropout³, graduation, and change of degree programme is identified. The dataset also allows to include in the analysis a measure of students' household economic situation (ISEE). This measure takes into account the household income, personal assets, real estate and the number of family members.

In the sample of 99,011 students, 48.6% are male; 58.4% of the students have a high school diploma ("liceo" in italian), 34.8% come from a polytechnic school ("istituto tecnico") and 6.9% from a vocational school ("istituto professionale"). The percentage of students

² Unfortunately, the data do not allow to distinguish between students who have left the University of Padova to enrol at another university and students who have left university altogether.

³ Interruptions due to pregnancy, illness, etc. are not considered as dropouts, as they are related to very specific reasons and are temporary in nature.

without Italian citizenship is about 2.8%, while the percentage of working students is 1.2%. Given the available variables and the panel structure of the data, the best form specification for studying dropout is to use survival analysis models. These models can account for censoring and for differences in the time at which individuals are at risk of experiencing the event. Compared with most previous studies (see, for example, Aina, 2013; Meggiolaro et al., 2017) using discrete hazard models, continuous time models are considered instead in the current study. Specifically, the Cox proportional-hazards regression model (Cox, 1972) for the cause-specific hazard of dropout is used, where the dependent variable takes the value of one if the individual drops out and zero otherwise. All other event-types (graduation, still at university) are treated as censored. Changing course is introduced in the models as an independent variable. This model specification makes it possible to interpret cause-specific hazards in much the same way as ordinary hazards, giving the marginal probability that the dropout event occurs later than a specific time t . The Cox proportional hazards regression model was chosen for several reasons, beyond the panel structure of the data and the nature of the available variables. Notably, it offers a valuable way of examining how various factors influence the risk of dropout, without requiring the specification of a functional form for the baseline hazard function. Additionally, the hazard ratio derived from the model provides a clear and intuitive measure of the relative dropout risk. Furthermore, the Cox model is a well-established and widely recognised statistical tool within the social sciences, supported by a substantial body of literature. This literature not only offers insights on the interpretation of the results but also discusses their validity and limitations when certain model assumptions (e.g., proportionality of hazards) are not fully met or not strictly verifiable (Therneau & Grambsch, 2000). Given the large sample size of 99,011 student careers, verifying the key proportional hazards assumption by testing for statistical significance could be misleading. This is because even minor deviations from the assumption can be statistically significant, despite being practically irrelevant. Therefore, we relied on graphical diagnostics, examining the cumulative Schoenfeld residuals over time for each covariate. The assumption is largely met, with the exception of the ISEE variable. As this variable exhibits a very modest deviation over time, we can consider the model robust to this violation.

In order to control for differences in students' behaviour according to disciplines, separate models were estimated for the four fields of study identified at the University of Padova: Scientific Studies (40.5% of the sample), Humanities (27.4%), Professional Health Sciences (17.4%) and Social Sciences (14.7%). The classification of fields of study is based on the grouping of the following University Schools: Professional Health Sciences includes the Schools of "Medicine" and "Agriculture and Veterinary Medicine"; Humanities includes the Schools of "Psychology" and of "Human and Social Sciences and Cultural Heritage"; Social Sciences includes the Schools of "Law" and "Economics and Political Science"; and Scientific Studies includes the Schools of "Engineering" and "Science".

5. Descriptive results

The following tables present data on student dropout rates over time intervals, offering insights into the dropout trends by enrolment cohort, and by some characteristics of the students and the field of study. Specifically, Figure 1 examines cumulative dropout rates at different time intervals across multiple cohorts, highlighting variations between cohorts and overall retention patterns. Figure 1 points out that dropout rates in the University of Padua are not negligible. Obviously, overall, dropout rates increase with time across all

cohorts, which is expected as more students leave over the years. There are slight variations between cohorts, but this general pattern remains consistent. The 6-months dropout rate has shown an upward trend, peaking at 6.46% in 2021-2022, suggesting potential difficulties in early retention. Around 20% of students in each cohort drop out within 2 years of enrolment and about 22% of students drop out within 3 years. Obviously, for the most recent cohorts (2021-2022, 2022-2023, and 2023-2024), the data for longer-term dropouts are incomplete as these groups have not yet reached the years 2 or 3.

Cohort	Dropout (in %)				N Observations
	Six Months	One Year	Two Years	Three Years	
2016/2017	4.28	15.99	20.50	23.54	11,776
2017/2018	3.97	15.18	19.65	21.77	11,600
2018/2019	4.54	15.99	19.88	21.71	11,300
2019/2020	4.17	13.67	20.38	21.74	11,970
2020/2021	5.36	16.27	21.73	22.30	12,975
2021/2022	6.46	17.40	22.70	-	13,516
2022/2023	6.05	16.28	-	-	12,969
2023/2024	5.32	-	-	-	12,905

Figure 1. Cumulative Frequency Distribution of Dropouts at Six Months, One Year, Two Years and Three Years from the Enrolment, by Enrollment Cohort.

Figure 2 compares dropout rates across students with different characteristics and in different fields of study, revealing differences in student persistence based on their characteristics and the academic discipline in which they enrolled. From this table, it can be seen that males have higher dropout rates than females at each time interval. After six months, the rates are similar, with 5.12% of males dropping out compared to 5.02% of females. However, the gap widens over time, reaching 16.80% for males and 14.26% for females after one year. By the third year, male dropout rates rose to 23.54%, while female rates remained lower at 19.20%, reaching a difference in rates of 4.34 percentage points and indicating greater long-term disengagement from studies for males compared to females.

For the secondary education type, high school students have the lowest dropout rates at every interval, starting at 4.02% after six months and rising to 17.73% after three years. Their dropout growth slows over time, with the largest increase of 8.62 percentage points in the first year, then decreasing to 3.76 and 1.33 percentage points in the following years. In contrast, polytechnic and vocational students face higher dropout rates and a faster initial increase, particularly in the first year, indicating greater challenges in retention. In conclusion, it could be said that high school students not only dropout less, but also at a slower and more stable rate.

Looking at dropout rates across different fields of study, Scientific Studies students exhibit the highest dropout rates at every stage, reaching 27.53% after three years, which may suggest greater academic challenges in these studies. In contrast, Humanities, Professional Health Sciences, and Social Sciences show significantly lower dropout rates, with Professional Health Sciences maintaining the most stable retention over time, ending with the lowest three-years dropout rate (16.94%).

Variable	Dropout (in %)				N Observations
	Six Months	One Years	Two Years	Three Years	
Sex					
Male	5.12	16.80	21.66	23.54	48,107
Female	5.02	14.26	17.90	19.20	50,904
Secondary school					
High School	4.02	12.64	16.40	17.73	57,810
Polytechnic	6.35	19.16	24.01	25.88	34,409
Vocational School	7.46	21.23	26.40	28.65	6,792
Field of study					
Scientific Studies	5.45	20.70	25.98	27.53	40,066
Humanities	4.96	11.99	15.39	17.11	27,141
Professional Health Sciences	4.81	12.34	15.80	16.94	17,223
Social Sciences	4.49	11.46	15.26	17.20	14,581

Figure 2. Cumulative Frequency Distribution of Dropouts at Six Months, One Year, Two Years, and Three Years from Enrolment Date, by sex, secondary School, and field of study.

6. Results

Univariate descriptive statistics give us a first glimpse of the characteristics of dropouts, but to really understand how variables interact in explaining dropout, a model taking into account when dropout occurs and considering the different covariates simultaneously should be estimated. Models are fitted separately by field of study, in order to control for differences in students' behaviour according to disciplines.

Figure 3 reports the results of the Cox proportional-hazards regression models for dropout. The columns show the hazard ratios (HRs) of the four models in relation to the fields of study. For each variable, the HR indicates how the risk of dropout changes relative to a reference category, with values greater than one indicating an increased risk (risk factor), and values less than one indicating a decreased risk (protective factor).

For the sake of clarity, only the coefficients for some selected variables are reported. Other variables included in the models and not reported in the table are: nationality, age at enrolment, whether or not the student enrolls immediately after secondary school, whether or not the student works, and the presence of disability.

The variables shown in Figure 3 affect the risk of dropping out differently according to the field of study. It is worthwhile to note that cohorts starting from 2020-2021 have higher risks of dropout than previous cohorts, and this is observed for all study fields. Being male compared to being female only affects dropout as a protective factor for Scientific Studies ($HR=0.663$) and is not significant in the other fields. Living outside the Veneto region increases the risk of dropout for students enrolled in Scientific Studies, but, at the opposite, it is a protective factor for Humanities.

Variable	Scientific Studies	Humanities	Professional Health Sciences	Social Sciences
Enrolment (ref: 2016/2017)				
2017/2018	0.904***	1.094	1.038	0.704***
2018/2019	1.000	0.915	0.971	0.839*
2019/2020	0.924*	0.918	1.143	0.851*
2020/2021	1.144***	1.239***	1.073	1.179*
2021/2022	1.174***	1.394***	1.276***	1.415***
2022/2023	0.997	1.355***	1.230**	1.333***
2023/2024	0.962	1.275***	1.397***	1.072
Sex: Male (ref: female)	0.663***	1.001	1.000	1.056
Province of residence (ref: Padova)				
Other Veneto province	1.023	0.988	1.070	1.140**
Non-Veneto province	1.118***	0.829***	1.104	0.904
Secondary school (ref: High school)				
Polytechnic	1.757***	1.473***	0.923	1.199***
Vocational school	2.455***	1.942***	1.092	1.656***
Secondary school score	0.968***	0.982***	1.000	0.983***
Irregular secondary school career (ref: no)	1.254***	1.157***	1.029	1.229***
Course change (ref: no)	0.592***	0.388***	0.674***	0.811
ISEE (ref: low)				
Medium-low	0.915**	0.871**	0.870*	1.005
Medium-High	0.807***	0.770***	0.793***	0.987
High	0.705***	0.659***	0.733***	0.887
Missing	1.239***	1.493***	1.566***	1.472***
Working (ref: no)	1.418***	1.707***	1.400*	1.944***
N. observations	40,066	27,141	17,223	14,581

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 3. Determinants of University Dropout by field of study: Cox Proportional-Hazards Models for Dropout; hazard ratios with statistical significance.

Regarding the secondary school type, students from vocational schools and polytechnics face a significantly higher risk of dropping out compared to those from high schools, with the exception of Professional Health Sciences. The effect is particularly strong in Scientific Studies, where vocational school students present an HR of 2.455, that is the strongest for the risk of dropping out with respect to all the other selected variables in the model. The secondary school score plays a protective role against dropout, with a unitary increase in the score reducing the risk of dropout, with the exception of Professional Health Sciences. Having an irregular secondary school career increases the risk of dropout, except for Professional Health Sciences.

In general, changing the degree programme (*course change*) compared to not changing prevents dropout, but is not significant in the Social Sciences.

For ISEE levels, higher income categories are generally associated with a lower risk of dropout across all fields of study, with respect to the lowest category. Medium-low, medium-high, and high income categories show significant decreases in the risk of dropout, with the HRs decreasing progressively as income increases. However, the *missing* category of ISEE data (32.7% of the sample) stands out, with significantly higher hazard ratios. The hypothesis that students would choose not to submit the ISEE, thus generating missing values, when household income is high seems unsupported by model results.

In summary, the results are fairly consistent with the existing literature. Particularly interesting are the results on the significant role of course change which is important for preventing dropout. The ISEE variable's unexpected results regarding missing values suggest that further investigation into the financial situation of students is needed. It is interesting to note that the results related to Professional Health Studies differ from those observed for the other field of studies, highlighting the importance of conducting separate analyses by study field.

7. Conclusions

The issue of dropout in higher education remains a complex and multifaceted challenge. As highlighted in this contribution, university dropout is not merely the act of abandoning one's studies before degree completion, but rather the result of a constellation of interconnected dynamics that hinder academic success. This paper shows that several aspects are at play and factors connected with dropout depend on individual and economic characteristics and also on the study field, and this suggests the need to consider the complexity behind the dropout phenomenon.

In summary, pedagogical debate has increasingly emphasized the need to adopt a multidimensional perspective when analysing dropout. Understanding dropout as a phenomenon influenced by both pre-entry characteristics and experiences during university life allows for a more comprehensive approach to intervention. While some students may reorient themselves towards more suitable educational or professional paths, for many, dropout represents an undesired and unplanned failure with long-lasting consequences.

Given these considerations, it is evident that dropout prevention cannot rely solely on student responsibility; rather, it necessitates institutional commitment and structural changes that should depend also on the study fields. Among the many possible good practices, the literature has increasingly pointed to the need for universities to implement comprehensive guidance and tutoring programs that extend beyond mere academic support at all the stages of the universities path (Aina et al., 2022; Abdul-Rahaman et al., 2023; Dato & Loiodice, 2018; Da Re, 2024).

In fact, tutoring and guidance are key strategies in promoting student success and preventing dropout in higher education. Beyond academic support, they foster belonging, motivation, and self-efficacy, factors closely tied to retention and completion (Biasi et al., 2017; Da Re, 2024; Ruiz Morillas & Fandos Garrido, 2014), along with individual and socio-economic conditions discussed in the previous sections. Early and sustained interventions, especially during transitions, reduce the risk of disengagement (Thomas &

Jones⁴, 2017; Tinto, 2012). Effective tutoring and guidance programs integrate study skills with psychosocial support and personalized advising, adapting to students' needs and disciplinary contexts (OECD, 2021). Seen as pedagogical best practices, they enhance engagement, clarify expectations, and build trust, supporting an inclusive academic experience (Dills & Traywick, 2024; Swecker et al., 2014; Unesco & Right to Education Initiative⁵, 2022;). As Golden⁶ and colleagues (2019) note, "high levels of non-completion or severely delayed graduation may be the result of failures in the guidance process from compulsory to higher education, inadequate student support mechanisms and/or inflexible programme offerings" (p. 1, point 5). These services should thus be core components of institutional responsibility and educational quality.

Undoubtedly, analyses such as those carried out in this paper are important in understanding which groups of students to intervene with, and that interventions may differ depending on the field of study. Interventions should be indeed tailored according to the type of study programme: for example, targeted actions and initiatives for students from vocational schools and polytechnics enrolled only in some study fields, particularly for those enrolled in Scientific Studies, could help them to eventually recover some competences not obtained in previous studies. Similarly, for students coming outside the Veneto region, some interventions with the aim of developing a sense of belonging could be particularly important for students enrolled in Scientific Studies.

Despite the peculiarities of the Padova case, the findings of this study can be generalised to other Italian contexts. More importantly, however, the analysis could be replicated in other universities, since the variables considered in this study are available in the administrative archives of many universities. Comparing the results could highlight common features and peculiarities of different institutions.

Ultimately, addressing university dropout requires a paradigm shift in the way higher education institutions approach student success. Rather than perceiving dropout solely as an individual failure, it should be understood as a systemic issue that calls for coordinated, evidence-based strategies to promote retention. By investing in student support systems and fostering inclusive educational environments, universities can not only mitigate the negative effects of dropout but also enhance the overall quality and accessibility of higher education.

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