MATURE VS YOUNG WORKING STUDENTS: SIMILARITIES, DIFFERENCES, AND DRIVERS OF GRADUATION AND DROPOUT

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Abstract

The high dropout rate among working students in higher education in Portugal, including both those who are older and at a mature stage in their professional careers and those who are young and recent workers, is one of the main concerns of educational policy. Identifying the drivers of the academic pathway for these students is essential to promote successful education and increase labour productivity and business competitiveness. Using an extensive longitudinal database of personal, course, and employment variables of 1,561 working students from a Portuguese higher education institution, we perform a duration analysis to determine and compare the factors that drive the dropout and graduation risks of mature and young working students in higher education. The results show that, in general, young working students are more positively influenced by financial aid, their motivation for the course, and the desire to find a new qualified professional career, while mature working students depend more on social and academic integration. The accumulation of knowledge/ skills in the 'out of class' experience seems to contribute positively to academic performance.

Introduction

The skills acquired during enrolment in higher education (HE) are predicted to result in higher labour productivity, thus increasing the competitiveness of business and allowing higher wages and global wealth (human capital theory, e.g. Becker, 1962). Additionally, graduated individuals are known to have a lower risk of unemployment and poverty, and a higher chance of being successful entrepreneurs. Moreover, the benefits of HE to individuals and society extend well beyond the economic sphere. Indeed, several non-economic benefits of HE are mentioned by Perna (2005), such as improvements in cognitive learning, emotional and moral development, and perceptions of citizenship, family life, consumer behaviour, leisure, and health at an individual level, and in increases in voting rates, charitable giving, blood donations, volunteer work, and adult literacy at a social level.

Considering these benefits, governmental efforts have been made to widen access to HE in Portugal, which resulted in a massive expansion of HE in the late 20th century (Heitor & Horta, 2014), with the total number of students growing from around 30,000 in 1960 to a peak of 400,000 in 2003. Moreover, from 2003 onwards, this number remained steadily between 350,000 and 400,000 despite the unfavourable demographics of the country (the population between 15 and 24 years old diminished by around 250,000 individuals in the same period). This is not only a consequence of the implementation of the Bologna process in 2006 and of the increase in direct social support by the government, but also from the Lisbon Strategy and its guidelines, aimed at increasing the presence of non-traditional students (NTSs) in HE and at promoting lifelong learning in the European Union (EU) countries, which have been followed in Portugal. Evidence of this includes the *Maiores de 23* (M23) admission regime, which is exclusively for students who are 23 or more years of age and does not require the completion of secondary school, which can be replaced by a qualifier exam on the scientific field of the HE course, and the recent facilitation of access to HE of students from vocational education, including the creation of vocational tertiary courses.

Regardless of the effort to promote the participation of NTSs in HE, which has been successfully accomplished both in the EU and in Portugal, educational policies that consider the specific needs and circumstances of these students while aiming at stimulating their academic performance are lacking; this contributes to the higher dropout rates of NTSs in comparison to traditional students. Using a five-year longitudinal sample of both traditional and non-traditional (working) students from a Portuguese HE institution (HEI), Carreira and Lopes (2019) found a dropout rate of 42% for NTSs and of 27% for traditional students. A study by Engrácia and Baptista (2018) including the full population of new enrolments in HE undergraduate courses

in Portugal in the 2011/12 academic year estimated a dropout rate of 50% among M23 students, well above the overall estimated dropout rate of 29%. This justifies the call for studies focusing on identifying the particularities of NTSs and on understanding the factors that explain their academic performance in HE, specifically their graduation chances and risk of dropout, that can be the basis for the development of specific and effective educational policies targeting them.

Several definitions of NTSs can be found in the literature. According to Gilardi and Guglielmetti (2011), Schuetze and Slowey (2002), and Schuetze (2014), the definitions typically include one or more of the following: students who enrol in HE only after some years have passed since graduation from secondary school, older students, students representing minorities (e.g. due to ethnicity, a deprived socioeconomic background and/or to being first--generation students), part-time students, married students, students with dependents, students without a secondary school diploma, and students who combine school with a professional activity (working students). In this study, we focus on working students as one of the most important groups of NTSs.

Working students are quite different from traditional students. They have less time available to study given their professional responsibilities and they must handle potential work-study conflicts. On the other hand, the fact that they can acquire soft skills in their jobs, such as communication and time management skills, can assist them in improving their school performance.

The research on the factors that explain dropout behaviour in HE has been very intense over the last decades and can be divided into three main groups: studies that do not distinguish among different types of students, studies that distinguish and compare traditional and NTSs, and studies that focus on NTSs. Regarding the studies that treat all students in pooled samples, the most established drivers of dropout are low academic performance/grades (Metzner & Bean, 1987), low academic and social integration (Tinto, 1975, 1988, 1993), low performance in high school (Bean, 1980; DesJardins et al., 1999; Murtaugh et al., 1999), employment (Gilardi & Guglielmetti, 2011; Vickers et al., 2003), field of study (Johnes & McNabb, 2004; Vickers et al., 2003), being a first-generation student/parents' education level (Ishitani, 2003; Stratton et al., 2008), marital status (Johnes & McNabb, 2004; Stratton et al., 2008), and nationality (Arias Ortiz & Dehon, 2013).

On the literature that directly compares traditional and NTSs in terms of predictors of dropout, Sorey and Duggan (2008) considered non-traditional students to be those aged 25 or older (mature students) and found that academic performance is of particular importance for young students, while for adult students the key factors are social integration, institutional commitment, degree utility, and finances. Gilardi and Guglielmetti (2011) and Carreira and Lopes (2019) investigated the differences between working

and non-working students and found that social integration and academic/ learning assistance during the first year of enrolment (or even during pre-enrolment) are of increased importance for working students, and that financial support and institutional orientation regarding the match between student interests or abilities and their courses have more impact on reducing the dropout rate among non-working students.

Finally, a growing wave of studies focus on NTSs. Park and Choi (2009) identified low organisational support and low relevance of the course for the student as the main predictors of dropout among mature students; Venegas-Muggli (2020) found that students who are parents, have a job, are not the heads of their households, are enrolled in longer programmes, and who attended adult high school have a higher risk of dropping out. For Portugal, Lopes and Carreira (2018) concluded that dropout behaviour and/or graduation achievement of working students are influenced by the motivation for the course, family educational background (in contrast to the direction generally observed for traditional students), professional background, social integration, and peer effects. Santos et al. (2016), focusing on explaining grades and not precisely on dropout behaviour, observed that the academic performance of M23 students seems to increase with age and to vary significantly across fields of study.

Although very rich, the literature has yet to explore the high heterogeneity within NTSs, particularly among working students. Indeed, some of them are relatively young, at the beginning of their active lives, and may have decided to start working only as a way to finance their studies. Their jobs are often part-time, unqualified, and unrelated to the academic course in which they are enrolled, as they are probably investing in school to find a new, permanent, and rewarding professional career, sometimes driven by social or family pressures. At the other extreme, working students may also be older individuals and mature professionals who have already built a strong portfolio of skills and experience while facing, at the same time, greater household responsibilities, as they have to afford their own homes and are married and parents more often. They can be labelled as 'delayed entrants' (Souto-Otero & Whitworth, 2017), as they have interrupted their normal academic progression earlier in their lives, often due to financial constraints, and return to HE only after several years. Even though they may also be in pursuit of professional transformation, these students are more likely to enrol in HE for motives related to professional pressure or progression within their current professional careers, particularly when tertiary academic qualifications are required, with the desire to complement their formation in some specific areas of knowledge, or for pure self-satisfaction only. It is thus reasonable to expect that the determinants of the academic path of mature working students differ from those of young working students. The analysis of the similarities

and differences between these two types of working students, including the identification and comparison of the main determinants of their academic paths, forms the main purpose of the present study and constitutes our first contribution to the literature.

Additionally, the majority of previous studies have focused only on dropout risk, thus neglecting the competing risk of graduation, which can have distinct determinants (Arias Ortiz & Dehon, 2013; Lopes & Carreira, 2018; Scott & Kennedy, 2005). In this article we address this gap by jointly estimating the risks of graduation and dropout. We do it by executing a duration analysis, under competing risks, on a longitudinal dataset on the working students of a Portuguese HEI, containing information on several personal, course and employment characteristics, that was built by combining four different data sources. Moreover, the richness of the information contained in our database allows dropout and graduation risks to be explained based on effective causes and not on factors that may be understood as symptoms. For example, instead of using poor academic performance as a potential factor for dropout, we use underlying factors that may explain it. Moreover, the field of study is used to control for the heterogeneity in the demands of courses from different scientific fields but not as a proxy for students' motivation and appropriate choice of the course. Instead, we use a variable that directly measures such motivation. Finally, based on the results, we develop policy recommendations, both at a central level (government) and at a local level (HEI).

Even though the article is planned to be essentially of an exploratory nature, inspired by the literature review, we formulate the following four research hypotheses to guide the analysis and impose a structured flow on the discussion of the results:

Hypothesis H1 (effect of financial support): social financial support is more important in reducing the dropout risk for young working students than for mature working students, as the latter benefit from higher financial independence.

Hypothesis H2 (effect of motivation for the course): a higher motivation for the course is more important in increasing graduation prospects and reducing dropout risk for young working students than for mature working students, as the latter have more established jobs and do not seek such strong professional transformation.

Hypothesis H3 (effect of teaching methodology): e-learning teaching methodologies, typically associated with a high dropout risk, may have a countervailing effect in the case of mature working students and contribute to their academic success, as they facilitate the work-study-family balance and these students are more often married and parents than their younger counterparts.

Hypothesis H4 (effect of social integration): improved social integration, as a contributor to the academic success of working students, is more important for mature working students than for young working students, as the latter benefit from a natural integration with traditional students due to age proximity.

The structure of the article is as follows. The next section describes the methodology, including the process of data collection and preparation, and the econometric modelling. Afterwards, in the results section, selected descriptive statistics are presented and discussed, highlighting the main similarities and differences between mature and young working students, followed by the analysis of the estimations of the model. Finally, some concluding remarks and policy recommendations are made.

Methodology

Dataset

In this study, we use an internal data source (SAD-BI, *Sistemas de Apoio à Decisão* - Business Intelligence) from Politechnic of Leiria, a HEI that is representative of the average Portuguese HE system in several aspects: number of students; quantity and quality of the academic qualifications and research of the teaching staff; number and diversity of study programmes offered; involvement with the surrounding society; and overall reputation. The SAD-BI database, which contains personal and background information at the student level, was then combined with three additional data sources: 1) the *Inquérito Caixa Geral de Depósitos* (ICGD), which is imposed by the school at the time of initial admission to all working students and provides information on several characteristics of the jobs held by the students; 2) the Iberinform Insight View online platform, which allowed us to obtain information on the dimension and business sector of the organisations employing the students in our sample; 3) the databases of *Direção-Geral de Estatística da Educação e Ciência* (Ministry of Education and Science, Portugal), for information on the course in which the student is enrolled. A description of the exact variables used in the study is given in Table 1.

The study comprises all working students that were enrolled in an undergraduate course of the Politechnic of Leiria in the academic years 2008/09 or 2009/10. These students were then observed until the end of academic year 2016/17 (i.e. for eight and nine years) and divided in two groups according to their age at initial enrolment: group 1 is composed of the 1039 working students aged over 25 (adult or mature working students subsample), and group 2 is composed of the 522 working students aged 25 years or less at admission (young working students subsample).

Regarding the age cutoff point, there is no consensus in the literature on education economics: 20 (Park & Choi, 2009), 23 (Santos et al., 2016) and 25 years old (e.g. Jinkens, 2009; Metzner & Bean, 1987) are some of the main alternatives. We chose 25 as the age cutoff point so as to follow the mainstream literature and address the objectives of the article. Indeed, choosing a cutoff

point younger than 25 would imply excessively unbalanced subsamples (the young working students subsample would contain a proportion of students lower than 30%). Moreover, requiring an age above 25 at initial admission is sufficient to capture the 'delayed entrants', i.e. those working students who are more likely to have interrupted their normal academic progression earlier in their lives, who have already built some experience in the labour market and whose return to school is more likely to be explained by motives related to progression and/or skills development within their current professional activity, and less likely by the desire to find a new professional career.

As SAD-BI implies a mandatory record for all students in each enrolment year and students are traceable by an identification number, we organised the data in a person-period dataset, with a total of 4,730 observations, where each observation corresponds to a record for each time period in which the individual is at risk of an event (DesJardins et al., 1999), so that duration analysis tools could be applied. The mandatory nature of SAD-BI in all years of enrolment has the additional advantage of making the joint database immune to sample attrition, i.e. a student leaves it only if he/she drops out or graduates. Finally, while the available data allowed us to control for the situations where students dropped out from one course but changed to another one within the HEI and for the multiple enrolment cases in which students leave one course but maintain enrolment in at least one course within the HEI (in which cases they were still considered to be at risk, and not considered effective dropouts), it was not possible to identify those students who moved to another HEI. Hence, dropouts in the present article represent leaving the HEI and not exactly leaving HE. However, given that working students in Portugal are typically associated with reduced mobility between HEI (for example, in our dataset, only 1.7% of students are transfers from other HEI) we believe that HEI dropouts overestimate HE dropouts only marginally.

Model

The econometric model used to test the research hypotheses and investigate how the academic path of the students (dropout and graduation probabilities, relative to the baseline outcome of no event) is affected by their personal, course and employment characteristics is based on a duration analysis approach (also known as event history analysis), under competing risks and a discrete time setting, as in Scott and Kennedy (2005) and Arias Ortiz and Dehon (2013), that allows its estimation through a multinomial logistic regression.

Following related literature, as the observation period is finite and the ideal definition of dropout (permanent interruption) is not implementable, we consider dropouts to be the cases when students interrupt their enrolment, are not observed to resume their studies within the observation period, and

the interruption period is of at least three years. Given the adopted definition, dropout behaviour can occur at the latest in year 5 for the students observed only for eight years. Hence, the database was restricted to the first five years of enrolment of students, implying a reduction from the initial 4,730 to 4,420 total person-period observations but assuring that all events of interest are observed in all years in an unbiased way.

The hazard of event k (k = 1,2, with 1 representing the graduation event and 2 representing the event of dropout) for individual i (i = 1,…,1039 or i = 1,…,522, if i is a mature working student or a young working student, respectively) at time t (t = 1,…,5) is thus:

$$h_i(k,t) = \frac{exp[(\alpha_{k1}D_{i1}+\cdots+\alpha_{k5}D_{i5})+(\beta_k X_{it})]}{1+\sum_{j=1}^{2}exp[(\alpha_{j1}D_{i1}+\cdots+\alpha_{j5}D_{i5})+(\beta_j X_{it})]} \qquad (1)$$

where $D_{i1},…,D_{i5}$ are time period dummy variables identifying each year (D_{i1} = 1 if the observation for individual i comes from the first year of enrolment, and D_{i1} = 0 if it comes from any other year) and the intercept parameters $\alpha_{k1},…,\alpha_{k5}$ capture the hazard probabilities when the value of all covariates is zero in each year. X_{it} is the vector of covariates, including the information on personal characteristics, educational background, course characteristics, peer characteristics and job characteristics of student i in period t. Finally, β_j (β_k) is the vector of parameters measuring the effect of the covariates on outcome j(k), on a logit scale.

The hazard of the no-event $h_i(0,t)$ is defined as, given by:

$$h_i(0,t) = \frac{1}{1+\sum_{j=1}^{2}exp[(\alpha_{j1}D_{i1}+\cdots+\alpha_{j5}D_{i5})+(\beta_j X_{it})]}. \qquad (2)$$

Hence, the ratio, usually referred to as the outcome-specific hazard ratio that measures the risk of experiencing event k relative to the risk of observing no event (the reference category in our multinomial logit model), can be computed as:

$$\left. h_i(k,t) \middle/ h_i(0,t) \right. = \exp[(\alpha_{k1}D_{i1}+\cdots+\alpha_{k5}D_{i5})+(\beta_k X_{it})]. \qquad (3)$$

Finally, taking logistic transformations on both sides of equation (3), we obtain:

$$\log\left[\frac{h_i(k,t)}{h_i(0,t)}\right] = (\alpha_{k1}D_{i1}+\cdots+\alpha_{k5}D_{i5})+(\beta_k X_{it}). \qquad (4)$$

It is now visible that the covariates are linearly related with the logistic transformation of the hazard ratio and not directly with the hazard probabilities. This is the equation to be estimated in the next section.

Results

Descriptive Statistics

Figure 1 displays the dropout hazard functions, corresponding to the evolution of the probability of dropout occurring in year *t* conditional on the non-event having occurred in each year before *t*. Similar to the majority of related literature (e.g. Arias Ortiz & Dehon, 2013; Lopes & Carreira, 2018), dropout risk has a peak in year 1, decreases throughout the normal duration of the degree (three years), and increases again afterwards. However, there are visible differences between the two types of students. Mature working students observe a higher dropout risk than young working students in the first two years of enrolment, while the opposite holds in years three, four and five.
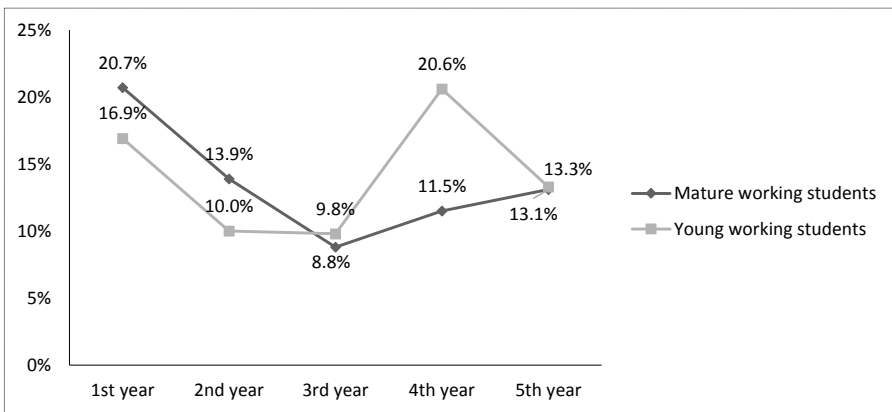
Figure 1
Dropout hazard functions

Table 1 presents the descriptive statistics of the variables used in this study, computed separately for each subsample of mature and young working students (columns 1 and 2, respectively). First of all, it is interesting to note that, within working students, and despite the different evolutions with time observed in Figure 1, there is no significant difference between the global dropout rates for mature and young students (40.9% and 41.4%, respectively). Coherently, the completion rate is only slightly higher for mature working students (49%) than for young ones (47%).

Table 1
Descriptive statistics – mean (standard deviation)

Variable	Description	Mature working students (1)	Young working students (2)
Graduation	Dummy: 1 if the student graduates during the first 5 years observation period; 0 otherwise.	49.2%	47.1%
Dropout	Dummy: 1 if the student interrupts his/her studies and has not returned to school for at least 3 years; 0 otherwise.	40.9%	41.4%
Male	Dummy: 1 if the student is male; 0 otherwise.	54.1%	45.8%
Age	Age, in years, at admission.	34.5 (7.3)	22.4 (2.1)
Married (male)	Dummy: 1 if the student is a married man; 0 otherwise.	27.8%	4.6%
Married (female)	Dummy: 1 if the student is a married woman; 0 otherwise.	20.9%	7.3%
Foreign	Dummy: 1 if the student does not have Portuguese nationality; 0 otherwise.	1.5%	1.5%
Scholarship	Dummy: 1 if the student receives social financial support; 0 otherwise.	3.0%	7.1%
First-call admission	Dummy: 1 if the student was admitted to the course in the first admission call; 0 otherwise.	91.0%	78.4%
First option	Dummy: 1 if the student is enrolled in his/her first option course; 0 otherwise.	95.9%	83.1%
NARHE	Dummy: 1 if the student was admitted to the course through the National Access Regime to HE; 0 otherwise.	15.6%	54.8%
Readmission	Dummy: 1 if the student was admitted as a return to the same course after at least one year of interruption; 0 otherwise.	7.9%	1.7%
Transfer	Dummy: 1 if the student was transferred from an equivalent course of another school; 0 otherwise.	1.9%	1.5%
Course change	Dummy: 1 if the student was admitted as a transfer from a non-similar course; 0 otherwise.	12.1%	8.6%
M23	Dummy: 1 if the student was admitted to the course through the M23 access regime; 0 otherwise.	46.2%	16.3%
TSC	Dummy: 1 if the student was admitted to the course after achieving graduation in a technological (post-secondary) specialisation course (TSC); 0 otherwise.	12.6%	15.9%
HE diploma	Dummy: 1 if the student is graduated from a different tertiary undergraduate course; 0 otherwise.	3.7%	1.2%
Daytime classes	Dummy: 1 if the classes occur between 8 am and 6 pm; 0 otherwise.	20.5%	32.4%
After-work classes	Dummy: 1 if the classes occur between 6 pm and 12 pm; 0 otherwise.	73.3%	62.9%
E-Learning classes	Dummy: 1 if the student is enrolled in an e-learning course; 0 otherwise.	6.2%	4.7%

Course average GPA	Average final grade point average (GPA) within the course.	13.9 (0.88)	14.1 (0.87)
Course % working students	Proportion of working students in the course in which the student is enrolled.	43.5%	37.2%
Micro-size organisation	Dummy: 1 if the size of the employer organisation is classified as micro according to the legal definition; 0 otherwise.	39.2%	39.7%
Small-size organisation	Dummy: 1 if the size of the employer organisation is classified as small according to the legal definition; 0 otherwise.	19.8%	15.1%
Medium-size organisation	Dummy: 1 if the size of the employer organisation is classified as medium according to the legal definition; 0 otherwise.	16.5%	12.6%
Large-size organisation	Dummy: 1 if the size of the employer organisation is classified as large according to the legal definition; 0 otherwise.	24.3%	32.2%
Self-employed	Dummy: 1 if the student is a self-employed worker; 0 otherwise.	10.2%	5.6%
Public sector job	Dummy: 1 if the student works in the public administration sector; 0 otherwise.	27.0%	18.8%
Qualified job	Dummy: 1 if the student has a qualified job according to the legal definition; 0 otherwise.	60.2%	34.3%
Unrelated job	Dummy: 1 if the student enrols in a course that has no relation at all with his/her job; 0 otherwise.	30.0%	52.1%

As expected, in the subsample of mature working students, the average age, 35 years, is much higher and with a higher dispersion than that observed in the other subsample. In contrast to young working students, mature working students are more likely male (54%) and married (28% and 21% of male and female mature working students, respectively, are married, as opposed to homologous percentages of 5% and 7% in the case of young working students). Regarding financial aid, 7% of young working students receive social financial support whereas only 3% of mature working students are granted a scholarship.

Almost all mature working students enrol in their first option course and in the first admission call, and with higher percentages than young working students, even though the majority of the latter also enrol in the first option and in the first call.

The main admission regime in Portugal, for young students, is the National Access Regime to Higher Education (accounting for 55% of young working students, as opposed to only 16% of mature working students). In contrast, the M23 admission regime is the most frequent among mature working students (accounting for 46% of them, as opposed to only 16% of young working students). Combined, the other five admission regimes at the undergraduate level in Portugal – graduation from a technological specialisation course in a related field of study, graduation in a different tertiary undergraduate

course, readmissions, transferences from other institutions and/or courses – account for 38% of the mature working students and 29% of the young working students in our data.

In Portugal, undergraduate courses can operate as daytime classes, after-work classes or on an e-learning basis (with no presential classes). Even though the majority of working students enrol in after-work courses, the proportion of younger students who enrol in a daytime course – which may be a signal of high flexibility of their professional agenda and/or, for example, that their jobs are frequently part-time – is higher than that of mature students.

Furthermore, mature working students are observed to enrol in courses with higher proportions of working students (facilitating their social integration) and with slightly lower average final GPA within the course (which may imply lower benefits from peer effects), as compared to the other subsample.

Regarding employment variables, and considering the subsample of mature working students, 10% of them are self-employed, 60% have qualified jobs and 27% are employed in the public administration sector. These proportions decrease to 6%, 34% and 19%, respectively, when the young working students subsample is considered. Regarding the size of the employer organisations, there are more students employed in micro and in large businesses, which can be explained by the facts that there is a huge majority of micro business in Portugal and that large businesses employ significantly more workers than the others.

The variable unrelated job is a dummy constructed by the authors signalling students that choose a course from a scientific field with no relation at all with their job. For example, a student enrolled in a marketing course working as a carpenter was classified with a value of 1, while a student enrolled in the same course but working on sales got a value of 0. There is clear evidence of a higher percentage of students with unrelated jobs in the subsample of young students (52%) than in the mature students subsample (30%), suggesting that young working students are indeed driven by their motivation to find a new (more rewarding) qualified career, while mature working students may be motivated to study to acquire additional skills, or to be promoted, within their current professional career.

Model estimation

The results of the regressions of the multinomial logistic model, estimated separately for mature and young working students using Stata and Gretl, are presented in Table 2. The fields of study, omitted from the table, were considered in the regressions as control variables. Both regressions revealed a statistically significant log-likelihood ratio and a high percentage of correct predictions. Also, variance inflation factor (VIF) tests were conducted in each of the regressions and confirmed the absence of multicollinearity problems.

Table 2

Multinomial Logit model (regression outputs)

Variable	Mature working students				Young working students			
	Graduation (1)		Dropout (2)		Graduation (3)		Dropout (4)	
Constant	−7.2221	***	1.5677		−6.1277	**	−1.3116	
Year 1	−3.5333	***	0.2043		−5.6563	***	−0.1417	
Year 2	−3.0892	***	−0.2571		−3.2935	***	−0.6808	*
Year 3	0.1764		−0.1312		−0.1400		−0.1379	
Year 4	−0.0701		−0.0268		−0.4131		0.5652	
Male	−0.0327		0.4419	**	−0.2113		0.4723	**
Age	−0.0025		0.0105		0.0695		0.0112	
Married (male)	0.3108	*	−0.0637		−0.3765		−0.6725	*
Married (female)	0.3481	**	0.1566		0.2020		−0.0340	
Foreign	−0.4825		−0.2181		1.3138	*	−0.9357	
Scholarship	0.7817	**	−0.3293		0.7707	**	−1.4120	***
First-call admission	0.2801		−0.0913		−0.0926		−0.2955	
First option	0.4711		−0.4188		−0.0910		−0.4429	*
Readmission	2.4808	***	0.5780	**	1.5842	*	1.0757	*
Transferral	1.5723	***	0.2509		0.5235		0.7983	
Course change	0.5869	**	0.1018		−0.0862		−0.0111	
M23	−0.0330		0.0423		−0.1120		0.3756	
TSC	−0.0068		0.2105		−0.0084		−0.1300	
HE diploma	1.0481	**	0.7526	**	−1.0409		−0.5972	
Daytime classes	0.3719		−0.7149	**	0.0609		−0.7221	**
E-Learning classes	−0.1396		0.5432	**	0.1720		0.3208	
Course average GPA	0.3638	***	−0.1402		0.2778	*	0.0418	
Course % working students	1.9359	***	−2.0403	***	0.2672		−0.8632	
Micro-size organisation	0.2711		−0.0319		0.2602		0.2017	
Medium-size organisation	0.4936	**	−0.2068		0.4451		0.2628	
Large-size organisation	0.2889		0.1654		0.1925		0.2670	
Self-employed	0.0014		0.1616		0.1553		0.2019	
Public sector job	0.1870		−0.3944	**	0.4476	*	−0.2413	
Qualified job	0.2191		−0.4243	***	0.0152		−0.2086	
Unrelated job	−0.1449		−0.1378		0.4555	**	−0.1990	
Number of observations	2830				1590			
Correct predictions	71.2%				74.5%			
Pseudo R^2	0.2052				0.2225			
Log-likelihood ratio	1001.96 (0.0000)				568.53 (0.0000)			

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

Considering the fifth year of enrolment as the residual category, we observe that, in both subsamples, the coefficients of years 1 and 2 are negative and statistically significant for the risk of graduation, reflecting the normal duration of the course of three years. On dropout risk, even though without strong evidence, the coefficients of the time dummies again suggest that, in the first two years of enrolment, the risk of dropout is higher for mature students than for young students.

On individual characteristics, we observe that female working students have a lower probability of dropping out than males. Married mature working students have higher chances of graduation than those who are single, and marriage also seems to reduce the probability of male young working students dropping out. Moreover, young working students from abroad are estimated to have a higher probability of graduation than those born in Portugal.

Support is found here for the use of scholarships as a policy instrument to promote the academic achievement of students, as it increases the probability of graduation in both subsamples as in Sorey and Duggan (2008) for the case of mature students. However, its effectiveness seems to be higher in the case of young working students, as it also helps reduce their dropout rate, an effect that does not occur for mature working students. This finding validates our research hypothesis H1.

On the motivation for the course, if young working students enrol in their most preferred course (first option), their probability of dropping out is reduced, which is not verified for mature working students. This evidence supports hypothesis H2.

A variable that is subject to special attention by policy makers is the admission regime. For young working students, the admission regime does not seem to be very important for explaining dropout and graduation risks. Only readmissions have a significant coefficient, indicating that readmitted students do not persist as long in the course (they either graduate or drop out more rapidly than the other young working students). This result is also observed for mature working students. For the latter, those with some previous experience in HE (readmissions, transferral, course changes and students who already have a HE diploma) have a higher probability of graduation, as compared to the baseline NARHE regime, which may be explained by their higher academic integration.

On course characteristics, we first observe that working students enrolled in courses with daytime classes have a lower risk of dropping out than those attending after-work classes or enrolled in an e-learning course, which may be associated with the higher time flexibility of those able to attend classes during the day. That dropout rates are higher in e-learning courses for mature working students is contrary to hypothesis H3, which is thus not validated,

and can reveal their higher needs regarding social and academic integration, as compared to young working students.

Second, for mature working students, dropout risk seems to decrease, and graduation prospects to increase, when they are integrated in classes with a high proportion of working students (effects that are not observed among young working students), which confirms the importance of social integration for them (Carreira & Lopes, 2019; Gilardi & Guglielmetti, 2011) and validates research hypothesis H4.

Third, the results highlight the importance of having successful peers for both young and mature working students, as higher averages of final GPA within the course contribute to increased graduation chances for all students, even when controlling for the field of study.

Concerning employment variables, we highlight that working in the public administration sector reduces the probability of dropping out among mature working students and increases the probability of graduation among young ones. Also, working in a medium size organisation may contribute to increased graduation prospects, as compared to working in a micro, small or large organisation. Finally, in the case of mature working students, holding a qualified job may decrease the probability of dropping out, while, for young working students, enrolling in a course unrelated with their job seems to increase the likelihood of achieving graduation, which is probably related with the previously mentioned high motivation to invest in a new, qualified, and more rewarding professional career (Lopes & Carreira, 2018). This last result validates hypothesis H2 and confirms the importance of motivation for young working students.

Discussion and conclusions

Working students have abnormally high dropout rates, which is explained not only by their higher time constraints (they dedicate a significant amount of time to their jobs, thus reducing the time available for school activities), but also by the lack of specific educational policies directed to them, as current policies are, in general, designed for traditional students. Considering the widely recognised internal and external benefits of HE, with the additional advantage of promoting a more rapid growth of labour productivity in the case of working students (as there is a real-time transfer to the economy), gaining a better understanding of the specific characteristics of these students is of major importance. Moreover, due to the high heterogeneity of working students, it is also important to distinguish between young working students – for whom the time gap between the conclusion of secondary school and the enrolment in HE is lower, and who, in most cases, have to deal with an

unfulfilling professional career (which makes then strongly motivated to complete their course of study seeking a significant professional transformation, with the possibility of finding a qualified new career) – and mature working students – who postponed the continuation of their studies earlier in their lives (sometimes because of financial constrains) and who have been in the labour market for several years, with established and qualified professions, and whose motivation to enrol in HE is likely to be related to promotion and development of skills within their current job. This distinction, including the identification of the key determinants of graduation and dropout for each type of working students, was the objective of the present article.

The results confirmed the main differences between the two types of working students. Relative to young working students, mature working students are married more often, are less likely to receive social financial aid, make more use of the M23 access regime to HE, and less use of the NARHE, enrol more often in courses related with their jobs and in after-work or e-learning classes, exercise more qualified professional functions, and work more frequently in the public administration sector or as self-employed.

Concerning the determinants of graduation and dropout, the results highlighted some similarities and some differences between the two groups of students. On the similarities, for example, in both cases, men are more likely to drop out than women, and, despite additional household responsibilities, married students perform better in HE than unmarried students. Next, being employed in the public administration sector seems to be a facilitator of graduation for young working students and a preventive factor of dropout among mature working students. There are also certain effects suggesting that some policies benefit both mature and young working students, as the awarding of scholarships (which aims to overcome the financial limitations of students), and the scheduling of daytime classes for those who can attend them. Regarding the latter, working students seem to have a lower risk of dropping out when they have a job that allows more time flexibility to reconcile work and study. Furthermore, in both subsamples, students benefit from the presence of successful peers, as a higher average final GPA within the course increases their probability of graduation.

On the differences in the determinants of the academic pathways, we found that the academic success of mature working students is very dependent on their academic and social integration, given that having previous experience in HE and attending traditional classes (as opposed to e-learning), jointly with other working students, increases their probability of graduation and/or decreases their probability of dropout. Therefore, from a policy perspective, it is important to manipulate policy instruments such as the composition of the classrooms and the time schedule of the classes to facilitate the integration and socialisation of these students, especially with other students facing

similar difficulties in managing the work-school balance. And this is of special value in the first year of enrolment, in which the risk of dropout is the highest for these students.

On the other hand, for young working students, their motivation for the course seems to be the key element for their academic success, as those who enrol in their first option courses have a lower risk of dropping out, and those who enrol in a course in an unfamiliar field of study with no relation to their jobs have a higher probability of graduating. This last result is indeed very interesting, as it suggests that young working students are more motivated to study and committed to earn a HE diploma when in pursuit of professional transformation. According to the human capital theory, by acquiring non-job-specific education, these students may foresee more benefits resulting from graduation than those working students investing in upgrading skills within their current professions.

Also, the fact that mature working students with established jobs enrol more often in courses related to their professions than young working students signify that they may be only interested in developing specific skills required for their jobs, and less interested in completing the entire course, thus limiting their incentives to achieve graduation (which is also supported by the evidence that those students with a previous HE diploma drop out more). In these cases, introducing flexibility in the curricular structure and/or offering shorter and simplified versions of the courses can help prevent these students from dropping out.

Finally, and still on mature working students, the fact that those with qualified jobs drop out less often than their counterparts reveals that the accumulation of knowledge and skills in the 'out of class' experience contributes positively to their performance in school as well.

To conclude, even though the results in the present study were obtained using data from a Portuguese HEI, and interpreted under the Portuguese context, we believe that they are extendable to other countries with similar HE contexts, especially in the EU, where the suggested policy recommendations may also be relevant and effective.

Acknowledgements

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