

# **EMPLOYMENT VARIABLES AND THE WORK-STUDY RELATION: A PORTUGUESE CASE STUDY**

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# Introduction - Motivation

- Working students represent currently around 8.5% of total Higher Education students and 13.2% of polytechnic students in Portugal;
- They are mainly adults that have been in the labour market for several years and return to education for getting a new opportunity to increase their qualifications;
- With different characteristics and motivations to study, they are also expected to have different determinants explaining their academic performance, which justify the need of a separate treatment.

# Introduction - Literature Review

## Determinants of academic performance (traditional students)

- Personal background (including gender, ethnicity and family income) - Betts and Morell (1999)
- Socioeconomic environment of the school - Betts and Morell (1999)
- Prior qualifications - Naylor and Smith (2004), Danilowicz-Gösele et al. (2017) and Trapmann et al. (2007)
- Scholarships - Marcenaro and Navarro (2007)
- ...

# Introduction - Literature Review

## Relation between employment and academic performance:

- Employment (particularly full-time) contributes to increase graduation time – Canabal (1998), Amann (2005), Triventi (2014) and Choy (2017);
- Employment has a negative effect on final grades – Stinebrickner and Stinebrickner (2003) and Jewell (2014).

# Introduction - Literature Review

## Relation between employment and academic performance:

- The relation between employment and academic performance is more complex than the effect of work intensity – according to Creed et al (2015) and Meeuwisse et al (2017), some employment variables are work-study conflicting and affect negatively the academic performance, while other facilitate the work-study relation and have a positive influence on academic performance

# Introduction - Goal

In this study, we aim to extend previous literature by jointly considering, for the first time to our knowledge, three dimensions that are expected to have a significant influence on academic performance: personal characteristics, course characteristics and employment variables.

We develop two regression models to find the main determinants of academic performance - measured by the final grade point average (final GPA) and by the completion time - of adult working students in higher education.

# Methodology - Data

Our longitudinal dataset is constituted by 323 working students that have enrolled in an undergraduate program, in Polytechnic of Leiria (Portugal), in the academic year of 2008/09 or 2009/10, and completed their degree until 2015 (still as working students).

It was obtained by matching three different sources and it includes information on individual, course and employment characteristics.

| Variable               | Mean (SD)    |
|------------------------|--------------|
| Final GPA              | 14.11 (1.63) |
| Completion Time        | 3.20 (0.93)  |
| Gender (Male)          | 38.1%        |
| Marital Status         | 39.9%        |
| Age                    | 33.60 (8.49) |
| Nationality (Foreign)  | 1.5%         |
| Parents' schooling     | 6.72 (3.47)  |
| Social science and law | 46,4%        |
| Daytime schedule       | 18.6%        |

Table 1: Summary statistics

The final GPA (ranging from 10 to 20) is, on average, 14.11, with a small coefficient of variation of 12%; this value is similar to the overall (working students + traditional students) average final GPA in Polytechnic of Leiria, which means that PLeiria graduated working students seem not to perform worse than graduated non-working students. This is also confirmed by the low average completion time (with however a higher dispersion).

Working students are older than traditional students, 40% are married and enroll mostly in courses with post-work schedule. Almost half of the students enrolled in courses from the field of social sciences and law.



| Variable                  | Mean (SD)     |
|---------------------------|---------------|
| M23 admission regime      | 43.0%         |
| Course average final GPA  | 14.15 (0.83)  |
| Course final GPA SD       | 1.33 (0.20)   |
| Course % working students | 46.8% (18.1%) |
| Self-employment           | 5.0%          |
| Related job               | 24.8%         |
| Public administration job | 26.6%         |
| Qualified job             | 59.1%         |

43% of working students in the sample enrolled under the M23 access regime, which is exclusive for students with 23 or more years old and is aimed to attract adults and to constitute a second opportunity for those who have interrupted their studies early, frequently because of financial constraints.

59.1% of the students in the sample exercise qualified jobs, 5% are self-employed and 26.6% work in the public administration sector. Furthermore, only 24.8% of the students enrolled in a course with an evident strong relation with their job.

Table 1: Summary statistics

# Methodology - Model

$$\text{Ordered logit model: } Y_i^* = X_i\beta + Z_{j(i)}\delta + H_i\theta + u_i. \quad (1)$$

with:

$Y_i^*$  – latent unobserved continuous variable;

$X_i$  - vector of observable personal characteristics of student  $i$ , specifically including gender (male), nationality (foreign), parents' schooling years, scholarship, school-residence distance, admission regime (M23 was set as the baseline regime), first call admission, married and part-time status);

$Z_{j(i)}$  - contains the observable characteristics of course  $j$  in which student  $i$  is enrolled, namely field of study (social sciences and law is the baseline field of study), course average (and standard deviation) final GPA, daytime schedule and course proportion of working students.

$H_i$  - vector of employment variables of student  $i$ , including the dimension of the employer organization (small size is the baseline), related job, qualified job, public administration job and interactions between gender and self-employment, self-employment (male) and self-employment (female).

**Table 2: Summary results for the first model - Ordered Logit (n = 332) Dependent variable: Final GPA**

| Explanatory variables                        | Restricted Coefficient | Complete Coefficient |
|--|------------------------|----------------------|
| Gender (Male)                                | 0.8823***              | 0.7953***            |
| Married                                      | 0.2758                 | 0.4092*              |
| Age  | -0.0143                | -0.0129              |
| Parents' schooling years                     | -0.0615**              | -0.0621**            |
| First call admission                         | 0.8987***              | 0.9082**             |
| Course average final GPA                     | 1.8655***              | 1.8967***            |
| Course final GPA standard deviation          | -0.2682                | -0.1009              |
| Daytime schedule                             | 1.6071***              | 1.7537***            |
| Course proportion of working students        | 2.1946                 | 2.4528               |
| Micro size employer                          |                        | -0.1595              |
| Medium size employer                         |                        | -0.3659              |
| Large size employer                          |                        | -0.7522**            |
| Self-employment (male)                       |                        | 1.8899**             |
| Self-employment (female)                     |                        | -0.8604              |
| Related job                                  |                        | -0.5801**            |
| Qualified job                                |                        | -0.1064              |
| Public administration job                    |                        | 0.5841**             |
| Correct predictions                          | 33.4%                  | 35.6%                |
| Likelihood ratio test (all regressors)       | 292.69***              | 311.26***            |
| Likelihood ratio test (employment variables) |                        | 18.453**             |

The negative effect of parents' schooling years signals that working students with a less favourable family background are more committed to study and find a rewarding professional career and financial stability for their own household than students with a more favourable family background. HE may thus contribute to promote social mobility among working students.

Marriage seems to contribute positively to school grades in the complete regression, which may reveal the importance of household and housing stability to the academic performance of working students.

A higher average final GPA within the course and daytime classes seem to contribute positively to the final GPA of working students. The first effect reveals the importance of peer-effects to the academic performance of working students. The second effect may reflect the higher time management flexibility of working students that enrol in daytime schedule courses.

# Results

Employment variables play an important role when explaining final GPA, as some of them are statistically relevant (and jointly significant at a 0.05 level). For example, working in a large organization has a negative effect on final GPA.

While having a non-significant effect on the final GPA of female working students, the effect of self-employment is positive and statistically significant for male students (meaning that a higher involvement with their jobs may facilitate the work-study relation).

A strong relation between the field of study and the professional area produces a negative effect on final GPA. This may reflect that working students are more motivated in school when aiming to find a new professional career than when pursuing a job promotion or the acquisition of new competences within their current professional career.

Finally, the results show that employment in a qualified job has a non-significant impact while working in the public administration sector contributes to increase final GPA, as compared to any other business sector.

# Results

For the completion time of working students, employment variables are found to be less important than personal and course characteristics, which seem to play the main role.

Nevertheless, working in the public administration sector seems to decrease graduation time.

In addition, it appears that exercising a qualified job delays graduation. This may be because of the higher responsibilities of qualified positions that consume more time and effort than unqualified job positions, which may contribute to increase the work-study conflict. Also, the expected career progression resulting from graduation is probably lower for qualified workers than for unqualified workers, thus reducing their incentives to study.

# Discussion

Working students who complete their course behave similarly to the graduated traditional students in terms of their final academic performance, but with different determinants explaining it, as we identified some personal and course variables with effects that are contrary to the most standardized results in the literature for the traditional students. Additionally, employment variables play an important role explaining the academic performance of working students, especially when measured by the final GPA.

Results suggest that the education of workers can contribute to social mobility as students with a poor personal background (low parents' schooling level) and professional background, i.e. who exercise less qualified jobs and are pursuing a new professional career by enrolling in courses with little relation with their jobs (transformative learning), perform better at school.

# Discussion

Studies that show the benefits for private employers of having their employees returning to school and increasing their skills might be important for them to facilitate the work-study relation, to participate more often in the financing of the education costs of their employees and to reward more rapidly graduated workers.

Additionally, the academic performance seems to be higher for students that work in smaller firms and that are self-employed (in the case of males) which, together with the aforementioned results, can be used by HE institutions when assessing the curriculum of the candidates in the admission process.

Flexible professional schedule may also be important to increase the academic performance of working students.



## Discussion - contribution

As adult working students have different predictors for their academic performance, the understanding of those effects (that we tried to enlighten here) is essential for policy makers to create a favourable environment for the participation and performance of those students in higher education, therefore contributing to promote efficiency and equity.