in completion rates between male and female students or between students from different fields of study.

The results of the logistic regression models showed that different factors play a significant role for students employed on campus or off campus. Students employed on campus have the highest completion rates. The critical success factor for these students is their position at the university. Students who have a research assistant position defend their theses more often than students who work as instructors or administrative staff at the university. Students not employed on campus are divided further into those not employed and those employed off campus. Employment itself has a negative impact on the outcomes. Non-working students have more chances of defending their thesis in comparison with students employed off campus. Among those employed off campus, those who decide to pursue a degree to build an academic career and plan to work in the university after graduation have more chances of defending their thesis. Participation in the advanced doctoral program, which has greater financial and academic support, has a positive impact for both groups.

Summary

Both parts of the research showed that employment does affect the process and the results of doctoral study. Cross-sectional data analysis showed that the characteristics of employment are connected with the doctoral students experience and those students who are employed on campus have more benefits during their study. Students with full-time off-campus work are the most vulnerable group in terms of the learning process. These students are already less focused on their study, they plan to work in non-academic fields, and they have the greatest difficulties in combining study and work. A longitudinal study showed that these students have less chance of defending their thesis. Combining study with work negatively affects the chances of a postgraduate student defending their thesis and thus contributes to the dropout rate. The exception is research positions at the university. Additional academic and financial support by the university is also an important factor of student outcomes. These findings might help to define the groups of students that are at risk and who should be targeted with support. In addition, they can be used as a basis for policy changes at the university and national levels.

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Differences in student work according to educational factors at a Hungarian university

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Introduction

In Hungary, since the 1990s, we have been talking about student employment as a phenomenon when students start working during their university studies. They either worked while studying or interrupted their studies and took a job. The boundaries between studies, work, and unemployment, and the output points have become increasingly blurred, so the start of a career can no longer be interpreted as a single closed process [1]. Student employment is a complex phenomenon, and during this transition period, student and employee status are constantly changing.

Based on EUROSTUDENT VI data, 39% of students in Hungary worked during the semester and 14% took up casual work. Nearly 40% of Hungarian students worked to cover their living expenses and would not be able to continue their higher education without paid work. In addition to financial reasons, gaining experience was an important motivating factor, and this type of employment was important for 25% of students. Gaining work experience was typical of young people, those in full-time students and students in a more favourable financial situation. In terms of educational level, work experience was typical for master's students [2].

According to previous large-scale studies investigating the relationship between the field of education and student employment, the proportion of working students is higher in the social sciences, arts, natural sciences, computer science and agriculture, while students studying medicine work less [2]. Study-related work is typical for students in the fields of computer science, engineering and economics, as employers in these fields are more interested in hiring students. However, according to EUROSTUDENT VI data, students in health care have often study-related jobs too [2].

In our research, the PERSIST 2019 database was used. We focused on the employment habits of students from the University of Debrecen (N=803), which has almost 30,000 students in 14 faculties.

Field of study and student work

Our results are consistent with previous research which shows that employers in some areas are more likely to recruit students. Regular work is typical for students in engineering, humanities and nursing, while students in medical, dental and pharmaceutical work less or have never worked. There are differences between nursing students and medical students, as the former can perform many professional tasks before graduating. While the performance of certain work in the professions of pharmacy, medicine or dentistry is dependent on the acquisition of a degree and a professional examination—students cannot gain relevant professional experience before obtaining their degree [3]. It can be assumed that medical students do not work because of curriculum inflexibility or training requirements. They are less dependent on an additional income from work or are less willing to risk success in their studies by working.

The Hungarian higher education system consists of three interdependent educational cycles: bachelor's, master's and doctoral studies. However there is also "undivided education", which means that in some majors it is possible to obtain a Master's degree in 10–12 semesters, whereby the student graduates with a Master's degree. According to earlier studies, students studying for a Master's degree tend to work during the semester, while two-thirds of students studying for an undivided degree do not work during the semester [2]. According to our results, Master's students worked more often than students in Bachelor's and undivided degrees, and they are also characterized by the correspondence between work and study. Our analysis also showed that bachelor's students rarely work in their first year; usually starting work in their second or third years. This decision can be explained by the fact that the first year is spent taking the basic exams and subjects and familiarising oneself with university life. Masters' students already have a university degree and a routine that makes it easier to combine work and study; it is also more important for them to gain work experience [2].

The frequency of employment is significantly influenced by the form of funding for education. If students do not have parental support or do not take out a student loan, they are more likely to take a job. Fee-paying students take up work more often than state-funded students. In addition to covering tuition fees, fee-paying students have a desire to acquire new skills and new friends, which is also reflected in the fact that fee-paying students more often have a study-related job. This raises the question of whether these students should plan their university careers more consciously? It cannot be ruled out that as fee-paying students already pay for their education, they do not change majors, and, if they already work, gain professional work experience.

Motivation for work

In 2019, a scale of 1 to 4 points was used to examine the motivations of student employment (the higher the score, the more consistent the motivation). Based on PERSIST 2019 data, independence from parents was the most important motivating factor, 66% of the students cited this factor, wanting to be independent from their family. Although independence from parents in all majors was a significant incentive for students to work, the main motivating factor for students in medical and sports studies was the funding of recreational/leisure.

The motivation to work is related to the socio-cultural background of the students, and we found that medical students and law students are in the best financial positions. This also explains why medical students work less, not only because of the training requirements, but also because they are less often required to work. There is a significant difference in that the second most important motivating factor for IT and art students was gaining work experience.

Limitations and conclusion

Our research results show that there are differences between majors in both the frequency and motivation of employment. Some research has highlighted that study-related work has a positive effect, while non-study related work has a negative effect on student performance. For a successful university career it is therefore important for students to have study-related work as it can benefit them professionally, but the match between work and study is typical only for a small proportion of students.

Fee-paying students are more likely to work, and previous results have shown that three times as many students drop out of university as fee-paying students than as state-funded students [4]. There was also a difference in work motivation, with IT students being most motivated to gain work experience. This is also important because 55% of IT students have a below-average persistence (adj.res.=3, p=0,035). In IT, the dropout rate is 49–55% [5].

Our previous research found that low persistence, negative perceptions of education, and student employment can encourage students to interrupt or abandon their studies. Student employment can be a possible factor in dropping out, so further research is needed to examine the institutional factors (contact with teachers, satisfaction with teaching, etc.) that reinforce or mitigate the negative effects of employment in addition to training areas and requirements.

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Wages of Czech graduates: The positive effects of work experience gained before graduation

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Introduction

This study evaluates the wage effects of student employment. According to the 2016 Eurostudent survey more than half of university students in the EU combine studies and paid work [1]. The motives to work are primarily financial but gaining experience is also important [1,2]. Previous research mostly finds that student employment increases wages after graduation [3,4]

Masaryk University alumni survey

This empirical analysis employs data from a Masaryk University alumni survey conducted in April 2020. Masaryk University is the second-largest university in Czechia with approximately 33,250 students enrolled in 10 faculties. The invitation to participate in the survey was sent to all graduates of Master's level programs graduating in 2017 and 2018 i.e. graduates were surveyed one or two years after graduation. In total 805 graduates replied (22.5%). Presumably, the COVID-19 pandemic was one of the factors contributing to low response rate.

Descriptive evidence

The data include the individual and employment characteristics of graduates. The final sample is restricted to graduates who report working at least 20 hours per week (N=684). Importantly, the survey includes job search questions, which identify graduates who worked before graduation and continued the same employment after graduation (N=265) and those who started employment after graduation (N=419). The results reveal that the wages of graduates with work experience are 17% higher relative to those without work experience. First, the difference in wages may arise due to favourable characteristics that allow graduates to find paid work during their studies and to advance their careers after graduation. For instance, males and students in STEM subjects may find it easier to find employment during their studies and earn more after graduation. Second, the difference in wages is attributed to better job characteristics. Graduates who gain work experience during their studies are employed more in private and foreign firms (rather than in public sector or NGOs), run their own business, or work in supervisory positions.

Results from the wage regression

The wage effects of student employment are further tested by estimating the wage equation. The dependent variable is the logarithm of gross monthly wage, and control variables include gender, field of study, year of graduation, academic performance during studies (GPA), city size, logarithm of working hours per week, type of company (public sector, Czech private firm, foreign firm, self-employment) and an indicator for a supervisory position. Estimates show that wages are 8% higher for graduates with work experience in the full model. A surprisingly high gender pay gap (23%) has emerged within two years of graduation. Graduates with STEM education earn on average 16% more, and wages do not depend on GPA. Self-employed graduates and those working in foreign companies earn 22–24% more than graduates employed in public sector or in private Czech firms. Graduates in supervisory positions earn 9% more, and those settled in towns with less than 100,000 residents earn 12% less. Graduates graduating in 2017 earn 6% more than the cohort graduating in 2018 which reflects a steep wage increase in the early career of graduates.

Conclusion

University students are attractive to businesses struggling to find skilled workers. This research shows that students who worked before graduation and continued the same employment after graduation earn 8% more relative to graduates who started a new employment after graduation. The results are robust to the inclusion of controls for student academic performance, education specialization, and job characteristics. A striking result is that a high gender pay gap (over 20%) emerges very early in the career of university graduates and persists in the Czech labour market [5].

The study has several limitations. First, the survey does not include information about the quality and length of the work experience before graduation. Second, the low response rate may influence the representativeness of collected data. Third, talented and more able students are more likely to combine study and work [2] and also