Psicología Educativa

Effectiveness of a Peer Mentoring on University Dropout and Academic Performance

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ABSTRACT

Mentoring programs have been proposed to reduce dropout and increase academic performance. We analyzed the effect of peer mentoring on university dropout and academic performance in the context of Spain. We applied a quasi-experimental posttest-only control group design with 3,774 students (mentees, *n* = 1,887; control, *n* = 1,887). Mentees had participated in a peer mentoring program. We apply the student's *t*-test, Cohen's *d*, phi statistic, and chi-square statistic. Mentees exhibited lower dropout than controls and showed higher academic performance regardless of the area of knowledge. Results support the implementation of mentoring programs in Spanish universities with the goal of reducing student dropout and increasing academic performance. The research provides empirical evidence for theory building in higher education studies, developmental relationships, and integration programs.

La eficacia de un programa de mentoría en el abandono y el rendimiento académico

RESUMEN

Se ha propuesto la aplicación de programas de mentoría para reducir la deserción universitaria y aumentar el rendimiento académico. En el artículo analizamos el efecto de la mentoría entre pares sobre el abandono universitario y el rendimiento académico en España. Aplicamos un diseño de grupo de control cuasiexperimental con medida post en una muestra de 3.774 estudiantes (mentorados, *n* = 1,887; control, *n* = 1,887). Los mentorados habían participado en un programa de mentoría entre pares. Aplicamos la prueba *t* de Student, la *d* de Cohen, el estadístico phi y el chi-cuadrado. Los mentorados presentaban un menor abandono que los controles y un mayor rendimiento académico independientemente del área de conocimiento. Los resultados avalan la implementación de programas de mentoría en las universidades españolas con el objetivo de reducir el abandono universitario y aumentar el rendimiento académico. La investigación proporciona evidencia empírica para la elaboración de teorías en estudios de educación superior, relaciones de desarrollo y programas de integración.

University dropout is leaving higher education studies before obtaining a degree and without reincorporation (Opazo et al., 2021). It is a systemic problem that influences students' career development, leading to an income loss for the university due to the decrease in tuition, and to a loss for the administrations who lose the investment provided to fund students' grants (Olaya et al., 2016). At a social level, dropout involves frustrations, a waste of time and private resources with no economic return (Fernández-Mellizo, 2022).

In 2018 the European Union spent 5% of each of its members' gross domestic product on education (UNESCO Institute of Statistics, 2021). It also put in place the European Education Area strategic framework to achieve their collective vision. Reaching at least 45% of the 25-to-34-year-old population holding a higher education degree by 2030

is among its strategic objectives (European Education Area, 2022). If this goal is to be achieved, university dropouts should be understood and monitored.

Academic performance involves the accomplishment of specific targets related to activities in instructional environments (Oxford, 2020). Academic performance in university environments seems to be negatively correlated to university dropout (Maluenda-Albornoz et al., 2022), this is, the higher the academic performance, the lower the university dropout, pointing at the potential benefit of the study of both concepts together.

Focusing on reducing university dropout, early first-year interventions have been claimed to be an effective choice (Ortiz-Lozano et al., 2018). Mentoring programs are developmental

relationships driven by mentors, who are more experienced in a particular field, and mentees, who have limited experience (Woo, 2017). Peer mentoring programs have been used to facilitate the transition and integration in the first year of university (Khoo et al., 2019), and have been shown to be related to higher levels of academic performance for undergraduates (Shauran, 2021) and lower levels of intention to leave university (Collins et al., 2014). In most mentoring programs, the satisfaction of the different agents involved (mentors, mentees, and program coordinators) is evaluated; however, the lack of evidence of the usefulness of mentoring has been claimed (Gershenfeld, 2014).

Spain is one of the main countries of Europe and a highly active member of the European project (European Union, 2022). The annual expenditure of Spain on education for all public administrations and universities reached 55,265.8 million euros in 2020 (La Moncloa, 2022). New students (33%) quit university before completion in Spain in the 2015-16 academic year, 13% taking into consideration on-site universities only (Fernández-Mellizo, 2022). Additionally, Spanish is the second language in number of native speakers around the world (Stewart, 2012). If cultural connections that language implies are considered, the study of university dropouts in Spain would be an interesting matter for the potential extrapolation of the results to other European and Spanish-speaking countries.

Although peer mentoring programs have been claimed to have the potential to reduce university dropout in Spain (Alonso-García, 2021), we found no study analyzing the effect of the implementation of a mentoring program on university dropout and student's academic performance in that context. Therefore, our purpose was to analyze the effectiveness of a peer mentoring program in reducing university dropout rates and increasing academic performance in Spain.

Theoretical Background

In the following section, we describe the concepts of university dropout, academic performance, and peer mentoring.

University Dropout

Different models have attempted to explain university dropout through theories such as attribution, expectations, goal setting, self-efficacy, or positive psychology (Aljohani, 2016; Demetriou & Schmitz-Seiborski, 2011; Flores et al., 2022). Additionally, new technological advances, such as machine learning, have been applied to the study of university dropouts (Cannistrà et al., 2021; Fernández-García et al., 2021; Opazo et al., 2021; Palacios et al., 2021).

Researchers have also focused on the forecast and the early detection of students with higher probabilities of dropping out. They have created algorithms to facilitate these tasks (e.g., Solis et al., 2018), looked for indicators and used Big Data to study the matter (Alban & Mauricio, 2019). Additionally, the early prediction of university dropouts has been studied through the most advanced systems, such as the early warning system that detects students who are more likely to drop out (Cannistrà et al., 2021), or the system for the early prediction of university dropouts that uses a random forest approach (Behr et al., 2020).

Research using logistic regression and artificial neural networks in the context of Ecuador has shown that students with the highest risk of dropping out are the ones experiencing vulnerable situations, who have low application grades (Sandoval-Palis et al., 2020). Additionally, research performed in Austria has shown that students' personal best goals are negatively associated with dropout intentions, while context-related problems are most likely associated with dropout intentions (Bardach et al., 2020).

The rank in which the students choose a degree when they submit their application also seems to influence retention (Casanova et al., 2018). Other relevant variables are the university entry marks, the previous academic results (Maluenda-Albornoz et al., 2022; Sandoval-Palis et al., 2020), and the area of knowledge of the studies (Mestan, 2016), the students of Arts, Humanities and Social Sciences being the most likely to drop out.

Other variables, such as the imbalance between students' academic expectations and what they find at the university (Conde et al., 2017), the increased psychological well-being and academic motivation (Suhlmann et al., 2018), influence university dropout. Additionally, the crucial role of certain value components, such as intrinsic value, attainment, and cost, has been linked to dropout intention (Schnettler et al., 2020).

The place of residence could also influence, in combination with others (Siri, 2015). We found different results in the literature around university permanence and gender. Casanova et al. (2018) found that women from northern universities in Portugal are at a higher risk of dropping out than men. González-Ramírez and Pedraza-Navarro (2017) found similar results in southern Spain (Sevilla). However, other studies found a higher dropout risk in men in Catalonia (Gairín et al., 2014), Madrid (Constate-Amores et al., 2021), and Oman or Kuwait (Saleem & Ayedh, 2013). Other authors have studied the differences in dropout and gender associated with the vocation (Fouarge & Heß, 2023) or performance (Casanova et al., 2018).

Social and academic integration have seemed to be relevant to understanding university dropout (Maluenda-Albornoz et al., 2022). The quality of students' institutional experience and their level of integration into the academic and social system seem to be the most influential variables for student retention (Aljohani, 2016), and social support and perceived social isolation have been related to the intention to quit through belonging and engagement (Maluenda-Albornoz et al., 2022).

Academic Performance

Academic performance refers to the accomplishment of specific targets in instructional environments (Oxford, 2020). It is the multifactorial or multicausal result or achievement (Jiménez-Caballero et al., 2014) derived from the learning process (León, 2008) which is directed by the teacher to reach the intended goals (Corredor-García & Bailey-Moreno, 2020).

One of the most studied variables in relation to academic performance has been intelligence (González-Benito et al., 2021). Motivational components have also been found to determine academic performance (Prieto, 2020; Sánchez-Santamaría et al., 2021). Additionally, academic performance in university environments has been considered negatively correlated with university dropout (Maluenda-Albornoz et al., 2022).

Mentoring, Permanence, and Academic Performance

Peer mentoring in university settings is a developmental process in which a student of higher courses (the mentor) holds a series of meetings with new students (mentees) to facilitate their integration and the development of their careers (Alonso-García et al., 2012).

The three main meta-analyses on the effectiveness of mentoring in academic environments are those by Jacobi (1991), Crisp and Cruz (2009), and Gershenfeld (2014). Despite the high number of programs examined, they did not find sufficient evidence of their effectiveness. Gershenfeld (2014) pointed out that the proliferation of mentoring programs has not been accompanied by empirical evidence of their usefulness.

Other authors suggested that improving the integration of students coming to the university through accompaniment programs could increase permanence (e.g., Casanova et al., 2018).

Mortagy et al. (2018) highlight the need to properly evaluate dropout, emphasizing that it decreases by 10% in students who participate in accompaniment programs. Sneyers and De Witte (2018) in their meta-analysis find that mentoring students and faculty has a significant positive effect on both retention and completion of studies, representing improvements compared to the control group. It seems that the key to mentoring is that it facilitates integration and the completion of the studies (e.g., Bernardo et al., 2016).

Another indicator of the effectiveness of mentoring programs is their positive influence on students' performance (e.g., Shauran, 2021; Venegas-Muggli et al., 2021). However, it is not always clear if this mentoring is focused on the transmission of content, or whether it seeks to make it easier to integrate into the university environment. As Egege and Kutieleh (2015) pointed out, the mentoring label is used for different accompaniment processes.

Hypotheses

We propose the following two hypotheses (*H*):

*H*1. If students go through a mentoring program during their first year of university, then their dropout rates in the first year will be lower than those who do not go through the program regardless of their gender, the order in the ranking in the studies selected by the student, the area of knowledge, and regardless on whether the student had to move from a different region to study or not.

*H*2. If students go through a mentoring program during their first year of university, then their academic performance will be higher in the first year than the performance of those who do not go through the program regardless of the area of knowledge of their studies.

Method

In the following section, we describe participants, measures, procedure, and data analysis techniques.

Participants

Participants were 3,774 students (mentees, *n* = 1,887; control students, *n* = 1,887). Table 1 shows the number of participants included in the study per group and academic year.

Table 1. Number of Participants per Group and Academic Year

Academic Year	Mentees	Control
2014/15	365	365
2015/16	451	451
2016/17	507	507
2017/18	564	564
Total	1887	1887

Note. N = 3,774.

Mentees belonged to 19 faculties, which were grouped according to the area to which they belonged (Table 2): Arts, Humanities, Social and Legal Sciences (*n* = 411), Sciences and Engineering (*n* = 248), and Health Sciences (*n* = 1,228). These numbers were proportional to the number of students who participated in each area of the mentoring program.

Table 3 shows the number of participants according to their role and gender. Mentees were 28% men and 72% women, slightly different from the general gender distribution at the University (37% men and 63% women, 9 percentual points) (Universidad Complutense de Madrid [UCM, 2022]), meaning that more women enrolled in the mentoring program than men. In addition, the mean age of mentees and control students was 19 years old (*SD* = 3.51). Age variability was minimal in the groups (> 90% of new students shared the year of birth). Taking the low participation of repeat students into consideration, most of the sample shared the year of birth, which would have made any analysis using this variable highly compromised and distorted. Therefore we avoided analysis based on age.

Table 2. Sample by Area and Faculty

Area	Faculty	Mentees (*n*)	Mentees (%)	Control (*n*)	Control (%)
Arts, Humanities, Social, and Legal Sciences	Faculty of Philology	8	0.42	8	0.42
	Faculty of Geography and History	11	0.58	11	0.58
	Faculty of Economic and Business Sciences	17	0.90	17	0.90
	Faculty of Political Science and Sociology	59	3.13	59	3.13
	Faculty of Commerce and Tourism	74	3.92	74	3.92
	Faculty of Law	88	4.66	88	4.66
	Faculty of Statistics	16	0.85	16	0.85
	Faculty of Social Work	138	7.31	138	7.31
	Total Arts, Humanities, and Social and Legal Sciences	411	22.00	411	22.00
Sciences and Engineering	Faculty of Biology	18	0.95	18	0.95
	Faculty of Geology	75	3.97	75	3.97
	Faculty of Mathematics	97	5.14	97	5.14
	Faculty of Information and Technology	58	3.07	58	3.07
	Total Sciences and Engineering	248	13.00	248	13.00
Health Sciences	Faculty of Nursing, Physiotherapy and Podiatry	142	7.52	142	7.52
	Faculty of Pharmacy	103	5.46	103	5.46
	Faculty of Medicine	174	9. 22	174	9. 22
	Faculty of Medicine (Human Nutrition)	86	4.56	86	4.56
	Faculty of Medicine (Occupational Therapy)	89	4.71	89	4.71
	Faculty of Dentistry	124	6.57	124	6.57
	Faculty of Optics and Optometry	56	3.02	56	3.02
	Faculty of Psychology	300	15.89	300	15.89
	Faculty of Veterinary	154	8.16	154	8.16
	Total Health Sciences	1228	65.00	1228	65.00

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).

Table 3. Sample According to Role and Gender

	Mentees	Control	Total
Men	441	604	1045
Women	1446	1283	2729
Total	1887	1887	3774

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).

We followed Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons regarding the processing of personal data and on the free movement of such data and respected the principles of research involving humans.

Setting

The Mentoring Program was a formal development program which enrolled students in their first year of university until the end of the first-semester exams. It facilitates the adaptation of new students. It is implemented in 19 faculties, and more than 400 mentors, 1,500 mentees, and 40 professors who act as coordinators participate each year. It takes place during the first semester. A group of six/seven mentees is assigned to a mentor, who is a student of higher courses that have passed, at least, 60 ECTS credits (European Credit Transfer System; European Commission, 2022).

Mentors carry out different meetings with their group of mentees, offering information to help them successfully interact in the university, acquire strategies to be effective in the courses, and boost their motivation to succeed. Mentors receive an 8-hour specific training and hold four/seven 50-minute meetings with their group of mentees. The goal and content of the sessions vary between establishing a connection, offering information about the program, collecting mentees' expectations, getting familiarized with the environment and the resources, etc. (Alonso-García et al., 2023). The program has the purpose of accompanying new students, increasing the quality of its service, and reducing university dropouts.

Mentors and mentees hold a minimum of four 45 to 60-minute meetings, with an approximate period of 10 days between meetings. The first part of the meeting is utilized to analyze how things have gone since the last meeting, the most urgent or necessary issues for the mentees are addressed, and any questions they may have are solved. The second part of each meeting focuses on a specific topic, where the mentor seeks the participation of the mentees by asking what they know about the subject, whether they have had any experience or problem related to the topic, etc. The mentor participates in the discussion by adding comments, guiding, and setting challenges or tasks for the mentees to complete (Alonso-García et al., 2023).

The content of each meeting differs. The first meeting aims at connecting the different members of the group and getting to know each other, offering information about the program and collecting the expectations of the mentees, as well as knowing the physical environment. Other meetings cover topics related to the subjects of the first year, the library and computer resources, administration and management topics, scholarships, career itineraries, and job opportunities. The last meeting closes the program.

Measures

We extracted the data from the SIDI application at the University. SIDI is the tool that supports the strategic planning of the University and performs learning analytics on the Virtual Campus.

We selected the following criterion variables: permanence/dropout and academic performance. First, permanence/dropout is a dichotomous variable that analyzes whether the student remained or withdrew from the university. Permanence is defined as enrolling in at least one course for one complete academic year, and dropout is not enrolling in any courses for one complete academic year. The operationalization of the variable used coincided with SIDI's definition. Second, academic performance is calculated by measuring the average grade during the first year and the performance rate (which was calculated by dividing the number of approved credits by the number of credits taken in an academic year).

In addition, the following predictor variables were included: the area to which the student's career belongs, the order in the ranking in which the student selects the studies, and the mobility of the student. First, the area to which his/her career belongs is measured by grouping the different programs into three main areas: Arts, Humanities, Social and Legal Sciences, Sciences and Engineering, and Health Sciences. Second, the order in the ranking in which the student selects the studies (first option versus second, or third). Third, the mobility measures whether the participants had to move to Madrid from other regions to start their university.

Procedure

The study was framed under the post-positivistic paradigm, which is devoted to the pursuit of truth while recognizing the difficulty of ever getting there (McMurtry, 2020). Randomization was not attainable because the students' participation in the program was voluntary; therefore we applied a quasi-experimental design. We applied a posttest-only control group design because the mentoring program had already taken place, and because we needed to allow a certain time between the treatment and the posttest. We selected two groups, the first received the treatment and the other did not (control group). Data was collected after the intervention. Data from both groups were compared to determine whether the treatment was effective (Frey, 2018). Special effort was made to create the groups as similar as possible by selecting the control group participants through a matching process with the quasi-experimental group.

Sample Selection

The requirements for inclusion in the quasi-experimental were participation in the Mentoring Program in the academic years before the study started and holding at least four sessions with their mentors. We used the enrollment database of the university to create the equivalent control group. For each mentee, a student with the same characteristics was randomly selected. The matching characteristics included: the academic year in which the student was enrolled, the program, the course, the order in the ranking in which the studies were selected, and the entry marks. These marks were classified in intervals (under five, between five and seven, and higher than seven). When for a given mentee there was no equivalent student that met the criteria, the case was eliminated (*n* = 212 cases were eliminated).

Data Analysis

To increase the sample, data from different academic years were merged after confirming they created no differences in the criterion variables. Data were compared between groups to determine whether the treatment was effective (Frey, 2018). Several tests were used to analyze the data:

(a) Student's *t*-test calculated whether there were significant differences between the control and the mentoring group in academic performance.

(b) Cohen's *d* was used to calculate the effect size ($d < 0.2$ = small effect, around 0.5 of a medium magnitude, and > 0.8 high magnitude; see Avello-Martínez, 2022),

(c) The chi-square statistic (χ^2) was used to contrast proportions with two variables and two categories of responses each, for example,

to analyze if there are differences between two groups when more than one condition was applied (e.g., permanence and dropout).

(d) When the chi-squared statistic was applied to a 2 x 2 contingency table, the effect size was calculated with the phi statistic (phi < .29 = low, .30-.49 = medium, and > .50 = high (Cárdenas & Arancibia, 2014).

Results

We now present the results categorized in two main sections: first, results related to the effect of the mentoring program on the dropout rates (hypothesis 1), and second, results on the effect of the program on academic performance (hypothesis 2).

Mentoring Program and Dropout Rates

First, when the dropout in the first-year criterion variable was considered, significant differences appeared between groups using the chi-square statistic (χ^2 = 26.47, p < .001). The phi statistic reached .08, indicating a small effect size. Table 4 shows frequencies and percentages of permanence/dropout for the two groups, showing a difference between groups. These results suggest that students who go through a mentoring program during their first year of university show lower dropout rates that same year than those who do not go through the program.

Table 4. Permanence vs. Dropout for the Two Groups

Group	Mentees		Control	
	N	%	*N*	%
Permanence	1576	83	1450	77
Dropout	311	17	437	23

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).

Second, these differences remain when analyzing the data based on student gender. The chi-square test showed statistically significant dropout rates between groups when only men were considered (χ^2 = 7.34, p < .01, phi = .08). The treatment group's dropout rate was 22% whereas the control group's rate was 30%. For women, the differences between groups remained (χ^2 = 13.77 p <. 001, phi = .07), showing lower dropout in the first year for the mentoring group than for the control group (15% vs. 20%).

When analyzing differences between genders, the chi-square test showed differences in the dropout rates between men and women. When only mentees were considered (χ^2 = 12.71, p < .001, phi = .08), the percentage of dropouts in the first year was 22% for men and 15% for women. Differences remained in the control group (χ^2 = 19.89, p < .001, phi = .10), with dropout percentages of 30% for men and 20% for women. The analysis based on gender can be examined in Table 5.

Third, the differences also remain when we analyze the data as a function of the preference ranking order of the student degree. For those students whose degree was selected in the first place, the differences remained (χ^2 = 14.52, p < .001, phi = .08), with a 14%

dropout in the first year for the treatment group and a 20% for the control group. When the degree is chosen in the second or later place, there are also differences between groups (χ^2 = 12.23, p < .001, phi = .09), being a dropout rate of 20% for the treatment group and 27% for the control group.

Table 5. Permanence vs. Dropout during the First Year Based on Group and Gender

Group	Permanence				Dropout			
	Men		Women		Men		Women	
	N	%	*N*	%	*N*	%	*N*	%
Mentees	344	78	1232	85	97	22	214	15
Control	426	70	1024	20	178	30	259	20

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887); total dropout for men = 275; total permanence = 770. Total dropout for women = 473; total permanence = 3,026.

Fourth, differences also appear when we take into consideration the areas of knowledge of the studies in which they were enrolled (Table 6). The chi-square statistic shows differences in the rates of dropouts in the first year between the groups in all the areas of knowledge of the enrolled degree: Arts, Humanities, Social, and Legal Sciences (χ^2 = 4.31, p < .05, phi = .07) show 18% of dropout rate for the treatment group and 23% for the control group; Sciences and Engineering (χ^2 = 5.25, p < .05, phi = .10), 28% for the treatment group and 38% for the control group; and Health Sciences (χ^2 = 17.607, p < .001, phi = .09) 14% for the treatment and 20% for the control.

Last, there are also differences when we consider whether the student must move to a different region at the beginning of the studies or not. The chi-square test shows differences in the rates of dropouts in the first year between the groups for participants who lived in Madrid prior to their enrollment in the university, which meant they did not need to move (χ^2 = 17.98, p < .001, phi = .08), the treatment group's dropout rate was a 16% and the rate for the control group was 22%. Differences were also present within those who had to move from a different region to study (χ^2 = 7.90, p < .01, phi = .08), with an 18% dropout rate for the treatment group and a 25% for the control group.

Based on these results we accept hypothesis 1, which states that students who go through a mentoring program during their first year of university show lower dropout rates that same year than those who do not go through the mentoring program regardless of their gender. These differences are statistically significant regardless of (a) the option in which they chose the career, the area of knowledge of the program in which they are enrolled and (b) whether they had to move from a different region to study or not.

Mentoring Program and Academic Performance

Regarding academic performance, when we use the average grade obtained in the academic first year as a criterion variable, differences appear between groups with a small effect size (Table 7). The treatment group obtained higher grades. In addition, differences are analyzed according to the number of enrolled credits, the number

Table 6. Permanence and Dropout Based on the Group and Area

Area	Mentees				Control			
	Permanence		Dropout		Permanence		Dropout	
	N	%	*N*	%	*N*	%	*N*	%
Arts, Humanities, Soc. & Leg. Sci.	399	82	72	18	315	77	96	23
Science and Engineering	178	72	70	28	154	62	94	38
Health Sciences	1039	86	169	14	981	80	247	20

Note. N = 3,774 (mentoring, *n* = 1,887; control *n* = 1,887).

of approved credits, and the performance rate (ratio between the number of approved credits and the enrolled ones). Again, there are differences between the groups for the three variables (Table 7). The treatment group passes more credits, enrolls themselves in more courses and their performance rate is higher at the end of the first year of the studies.

Table 7. *t*-test of the Performance Rate for the Groups

	Mentees		Control		*t*	Cohen's *d*
	M	*SD*	*M*	*SD*		
Average grade	6.37	1.66	5.93	2.00	7.36**	0.24
Approved ECTS credits	51.95	15.62	48.25	18.60	6.62**	0.22
ECTS credits enrolled	57.00	9.67	54.05	14.41	7.40**	0.24
Performance rate	0.85	0.24	0.80	0.29	6.30**	0.21

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).
** *p* < .01.

Table 8 shows the mean score of the groups in each area, the *t*-values and the effect size. Significant differences are found between both groups in the three areas in favor of the treatment group, with *p* < .05 for all cases. The corresponding values of Cohen's *d* are comparable and around 0.20, indicating a similar small effect size in the three cases.

The results are similar when the other variables are considered: enrolled ECTS credits and performance rate in the first year. There are also statistically significant differences between groups in the three areas when those variables are taken into consideration, as shown in Table 9.

These results support hypothesis 2, which states that the students who go through a mentoring program during their first year of university have a better academic performance that first year than those who do not go through the program regardless of the area of knowledge of the degree.

Discussion

We have shown the effectiveness of mentoring in decreasing dropout and improving academic performance in the first year of the studies. In this section, we discuss the results, reflect on the limitations of the study, and point out implications for research and practice.

Mentoring and Dropout Rates

We have shown that peer mentoring in university environments might facilitate the transition and integration into the first year of university (Khoo et al., 2019) and might lower the levels of intention to leave (Collins et al., 2014) and actual abandonment that first year. These results support previous research which suggested that mentoring has the potential to reduce university dropout in Spain (Alonso-García, 2021). These programs could help new students in their adjustment to the new environment and reduce differences between their expectations and reality (Conde et al., 2018). The program could also have a positive influence on psychological well-being and academic motivation (Suhlmann et al., 2018). Future research should investigate these variables to determine if this could be the case.

Results also suggest that mentoring, by improving the integration of students through an accompaniment program during the first year, might help to increase permanence (e.g., Casanova et al., 2018). Future studies should explore whether the difference in the dropout is due to the implementation of an accompaniment program or due to the specificities of the mentoring partnership.

Differences in the dropout in the first year between the mentoring and control groups occur in the three areas of knowledge analyzed, being higher for Sciences and Engineering. Data support previous findings, such as those that find that Arts, Humanities, and Social Sciences is the area of knowledge in which students are most likely to drop out (Mestan, 2016) or those in which abandonment decreases after a mentoring program is implemented (Mortagy et al., 2018; Sneyers & De-Witte, 2018). Future research should explore why Health Sciences have inferior dropout rates than the other two areas or if these differences could be explained by changes in the vocation of students in each area.

Students who have a mentor show differences in dropout in the first year regardless of gender, contradicting previous results which showed higher dropout in women (e.g., Casanova et al., 2018; González-Ramirez & Pedraza-Navarro, 2017) or in men (e.g., Constate-Amores et al., 2021; Gairín et al., 2014). Other authors suggest there is insufficient evidence (Constate et al., 2021). We recommend continuing the study of these individual differences to explore the dynamics between gender and dropout rates.

We also found differences between groups regardless of the order in the students' ranking of the degrees in which the student selected

Table 8. *t*-test for the Average Grade and Credits Passed Based for the Groups

Area	Average Grade						Approved Credits					
	Mentees		Control		*t*	*d*	Mentees		Control		*t*	*d*
	M	*SD*	*M*	*SD*			*M*	*SD*	*M*	*SD*		
Arts, Humanities, Social and Legal Sciences	6.45	1.63	5.84	2.05	4.70**	0.33	54.37	15.41	49.19	19.56	4.22**	0.29
Sciences and Engineering	5.67	2.03	5.12	2.27	2.86**	0.26	45.38	19.15	40.32	21.99	2.73**	0.25
Health Sciences	6.48	1.54	6.12	1.88	5.20**	0.21	52.47	14.53	49.54	17.09	4.58**	0.19

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).
** *p* < .01.

Table 9. Academic Performance Based on Group and Area

Area	Credits Enrolled						Performance Rate					
	Mentees		Control		*t*	*d*	Mentees		Control		*t*	*d*
	M	*SD*	*M*	*SD*			*M*	*SD*	*M*	*SD*		
Arts, Humanities, Social and Legal Sciences	57.74	10.63	55.33	15.32	2.62**	0.18	0.87	0.22	0.80	0.28	4.28**	0.30
Sciences and Engineering	55.05	12.67	49.71	17.36	3.91**	0.35	0.75	0.31	0.68	0.35	2.51*	0.23
Health Sciences	57.16	8.53	54.50	13.25	5.91**	0.24	0.87	0.23	0.85	0.27	4.31**	0.17

Note. N = 3,774 (mentoring, *n* = 1,887; control, *n* = 1,887).
** *p* < .01.

the studies. This result suggests that the influence of the program on the first year dropout might be stronger than the influence of the order in the studies' ranking (Casanova et al., 2018). Further research should analyze these relations.

In addition, the differences persist between groups regardless of the previous region of student residence. This result suggests that the relationship between the program and the dropout in the first year might be stronger than the relationship between the need to change the place of residence to study and the dropout during the first year (Siri, 2015). These dynamics should also be explored in a more heterogeneous sample.

The effect size of the differences is small, as in other studies, such as that of Sneyers and De Witte (2018). The mentor might influence a student's decision not to abandon their studies during the first year, depending on the reasons they must consider leaving (Alonso-García, 2021). Thus, if it is due to poor academic results, it could make the student see that failing some subjects is not too abnormal when first entering the university; if it is because the student does not like the subjects, the mentor can explain the generic nature of the subjects of the first year; if it is because of difficulties in establishing social relations, he/she can help them to improve this aspect, etc. Dropping out of university is a complex problem influenced by individual, group, organizational and social variables, although mentoring and the role of the mentors can help to surmount this problem. Further research should explore the concept through a multi-causal perspective to understand the broader scope of the phenomenon.

Mentoring and Academic Performance

Results show differences in academic performance in the first year between groups, supporting previous studies (e.g., Leidenfrost et al., 2014). Mentees pass significantly more credits, take more subjects, and have a higher performance in the first year than students in the control group. These differences are common to all areas of knowledge. The treatment group passes more credits, enrolls in more courses, and shows a higher performance. Mentors offer strategies to overcome challenges such as consulting manuals, obtaining notes, answering activities that increase their learning, or tips on where to get exams from previous years to practice. Similarly, mentors motivate mentees to attend the exams, and all of this seems to have an impact on the results. These strategies offer a motivational component to the mentees, in line with the suggestion of previous studies (Prieto, 2020; Sánchez-Santamaría, et al., 2021).

It is worth mentioning that the mentoring program did not train mentees in academic contents, which would have been considered peer tutoring instead of mentoring; this distinction is key to distinguishing between the types of programs (academic versus accompaniment) and to avoiding the confusion pointed out by Egege and Kutieleh (2015). In addition, all these actions can also benefit other students who do not have a mentor, either because classmates who are mentees share the information with them, or because they use other techniques such as study groups, which could reduce the difference between groups.

The access grade and previous academic performance appear to influence performance (Maluenda-Albornoz et al., 2022; Ortiz-Lozano et al., 2018; Sandoval-Palis et al., 2020), and, therefore, future research should use these factors as control variables to rule out their effect in the dependent variable.

Among the limitations of the study, we can highlight the different sample sizes between the areas of study, with a predominance of Health Sciences in comparison to the others. To minimize the effect of this difference, results were analyzed independently in each area, finding similar differences between groups in all the areas for dropout and academic performance.

A second limitation would be the difference in groups' gender composition. Mentees were 28% men and 72% women, slightly different from the general gender distribution at the university (37% men and 63% women, a 9 percentual-point difference) (UCM, 2022). We opted for analyzing a larger sample at the detriment of not being fully homogeneous, though future research could replicate the gender composition of the groups based on the overall institutional gender composition of the students at that institution.

A third limitation would be the baseline motivation of the students. Randomization was not attainable because the students' participation in the program was voluntary, therefore we applied a quasi-experimental design. Even though we made a special effort to create the groups as similar as possible by selecting the control group participants through a matching process with the quasi-experimental group, differences between groups based on motivation and related factors could have been present. Mentees could have been more motivated or engaged than controls. Results should be interpreted with caution and future studies should address and examine this issue, for example, by randomly dividing the two groups among the students who show interest in the program. This would equal the groups in motivation.

A fourth limitation would be that despite the quasi-experimental designs supposedly generating internally valid estimates of causal effects, one of the major concerns underlying these approaches is whether the estimated effects from the analytic samples using these designs are generalizable to other populations of interest (Frey, 2018). Future research should be performed in other Spanish universities to evaluate the capability to generalize the results to the Spanish context, and research in other countries should be performed to examine whether these results would be generalizable regardless of the context, or if they are context-specific.

A last limitation of the study could be the small effect size; however, it is consistent with the results found in the literature. Mentoring can be a factor that influences permanence or academic performance, but along with other variables that should be consciously studied.

This study explores an approach to reduce university dropout during the first year, a systemic problem that implies delays in career development lead to income losses to the university (Olaya et al., 2016), and produce many frustrations for students and their families (Fernández-Mellizo, 2022). This study provides evidence supporting the implementation of mentoring programs in Spanish universities with the goal of reducing student dropout in the first year of the studies.

The study also explores the effects of mentoring on academic performance, finding that students who participate as mentees show better performance during the first year of their studies. This result also provides support for the implementation of mentoring programs in Spanish universities with the goal of increasing academic performance.

If the European Union intends to reach at least 45% of the 25 to 34-year-old population holding a higher education qualification by 2030 (European Education Area, 2022), implementing mentoring programs in their universities might be a good and affordable option.

This study has value as it analyzes the effects of peer mentoring in university settings, in student dropout, and in academic performance in the first year of the studies in Spain, an aspect for which there are scarce publications. The research, therefore, provides empirical evidence for theory building in higher education studies, developmental relationships, and integration programs.

Our study measures specific indicators that demonstrate the value of the program through well-established results focusing on behaviours (Alonso-García, 2021), and answering the request for evidence of the mentoring program's usefulness (Gershenfeld, 2014).

Conflict of Interest

The authors of this article declare no conflict of interest.

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