ACADEMIC SELF-EFFICACY IN PORTUGUESE PUBLIC HIGHER EDUCATION STUDENTS

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Abstract

Academic self-efficacy refers to the belief of an individual successfully attaining an academic task or achieving a specific academic goal. Self-efficacy is critical to student success because it influences the choices students make along their academic and professional path. This study aimed to determine the level of academic self-efficacy in higher education students and to verify if there were differences statistically significant, taking into account the sociodemographic variables, namely, gender, age and nationality, and the academic variables, such as scientific area, degree, course year, course with or without integrated internship and attendance regimen. To achieve these objectives, an observational, cross-sectional, quantitative and analytical study was carried out based on a random sample of 2152 individuals from a total of 8200 students enrolled, in the 2018/2019 school year, in a public higher education institution located in the Northern of Portugal. The margin of error was 1.81%. The students were aged between 17 and 52 years old. The students registered a moderate level (4.42 ± 0.092) of academic self-efficacy out of 7. It was observed that 45.5% of the students registered a high level of academic self-efficacy; 17.9% revealed a low level; and the remaining 36.6% showed a moderate level. Statistically significant differences were found in academic self-efficacy taking into account the nationality of students (p-value = 0.041). The foreign students registered a highest academic self-efficacy level. Additionally, the comparison analysis demonstrated that there were significant differences between the students' scientific area (p-value = 0.004) and attendance regimen (p-value = 0.043). It was the Technology and Management students as well as the worker students who had the highest levels of academic self-efficacy. Nationality, scientific area and attendance regimen showed to be differentiator factors of academic self-efficacy. Foreigner students, worker students and students from the technology and management scientific area showed more confidence to achieve their academic goals. In fact, students' confidence in succeeding in their academic assignments will affect their lifelong learning. Therefore, higher education institutions should be able to improve the academic self-efficacy of students, creating innovative learning environments adapted to the needs and knowledge of their students.

Keywords: Academic self-efficacy, Academic performance, Higher Education, Student.

1 INTRODUCTION

Self-efficacy can be defined as someone's perceived ability to learn or perform actions at specific levels and/or areas [1]. According to the literature, self-efficacy is an essential component of positive psychology and a central influence on the well-being of individuals. In education, self-efficacy is a belief about what one can do and achieve when performing a task or achieving a specific academic goal [2-6]. Academic self-efficacy is essential for student success, as it is associated with academic achievement and the choices students make in the areas and degree courses they follow. Several studies have shown that academic self-efficacy is significantly associated with student learning, cognitive involvement, analytical thinking, academic responsibility, strategy use, persistence, susceptibility to negative emotions, and achievement [6-13]. Students who rely on their ability to organize, execute and standardize their performance in problem solving or academic tasks demonstrate high self-efficacy [14]. Self-efficacy is a strong predictor of academic performance and motivation to learn [15]. In addition to motivation, time management and study habits, students are expected to focus on study, use effective study strategies, and develop a positive attitude toward hard work and achievement, always with the goal of achieving academic success [1]. Students with high academic self-efficacy engage more easily in challenging academic tasks and use learning strategies more effectively. Thus, these students are more likely to succeed when faced with difficult tasks compared to other students with low academic self-efficacy [16,17]. Students with low levels of academic self-efficacy, move away from school, experience motivational problems and anxiety [18]. As a result, their academic performance is poor and they tend to dropout school. Several studies report that there were significant differences between academic self-efficacy taking into to account sociodemographic and academic

factors [13, 19,20]. For example, some studies indicate that academic self-efficacy is higher in male students [19-21], in social science students compared to health sciences, fine arts, physical sciences and engineering students [19,20,22,23] attending the most advanced degree course years [13,19,20] and students belonging to families with a more advantageous economic and financial situation [13,19,20,24]. However, other studies indicate that academic self-efficacy is higher in females [13]. But, not always, there are statistically significant differences in academic self-efficacy taking into account the gender factor [13,25]. In this context, this study aimed to determine the level of academic self-efficacy in higher education students and to verify if there were statistically significant differences, taking into account the sociodemographic (gender, age and nationality) and academic factors (scientific area, type of degree, degree course year, course with or without integrated internship and attendance regimen).

2   METHODOLOGY

In this section, the sociodemographic and academic characterization of the students (participants) is made. Furthermore, the structure of the questionnaire used to collect data (instrument) and the procedures used to conduct the research (data analysis) are described.

2.1   Participants

In this cross-sectional study, the simple random sampling method was used to select the participants. The population consists of students enrolled in the academic year 2018/2019 in a public higher education institution located in the northeast of Portugal. The selected sample consists of 2152 individuals from a total of 8200 enrolled students. The margin of error was 1.81%.

Table 1. Sociodemographic and academic characteristics.

Variables	Categories	n	%
Gender	Female	1171	54.4
	Male	981	45.6
Age	From 17 to 20 years old	1246	57.9
	More than 20 years old	906	41.1
Nationality	Portuguese	1775	82.5
	Other	377	17.5
Scientific area	Education Sciences	1304	60.6
	Technological Sciences and Management	133	6.2
	Agriculture Sciences	452	21.0
	Health Sciences	263	12.2
Type of degree	Professional Higher Technological Course	170	7.9
	Graduation	1913	88.9
	Post-graduation	13	0.6
	Master	56	2.6
Year of attendance	1st year	912	42.4
	2nd year	745	34.6
	3rd year	452	21.0
	4th year	43	2.0
Degree course with integrated internship	Yes	1778	82.6
	No	374	17.4
Attendance regimen	Ordinary	2075	96.4
	Student worker	77	3.6

As shown in Table 1, students attended a degree course within four different scientific areas, existent in the institution, namely Education (60.6%), Technologies and Management (21.0%), Agriculture (6.2%) and Health (12.2%). The majority was female (54.4%), Portuguese (82.5%), 17 to 20 years old (57.9%) and attended a graduation degree (88.9%), in an ordinary full-time attendance regimen (96.4%).

2.2 Instrument

In this study, it was used a questionnaire for data collection. The survey took place from October 2018 to January 2019. The questionnaire was completed in the classroom in the presence of the teacher. The participation of the students was voluntary. The anonymity and data confidentiality were guaranteed. The questionnaire was structured in two sections. The first section included sociodemographic variables (gender, age and nationality) and academic variables (scientific area of the degree, type of degree, year of attendance, degree course with or without integrated internship and attendance regimen) that allowed to do the characterization of the respondent. The second section included the Portuguese adaptation of the specific perceived academic self-efficacy scale [26]. This scale involved 10 items, and the answers were coded by a Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree), in order to assess respondents' beliefs about their ability to perform certain behaviors in academic situations. The level of academic self-efficacy was considered low (average score: ≤ 3.44), moderate (average score: 3.45 to 4.44) or high (average score ≥ 4.45).

2.3 Data analysis

The IBM SPSS Software version 25.0 was used to edit and analyse the data. For the nominal variables were calculated absolute and relative frequencies and for the ordinal and quantitative variables were calculated measures of central tendency (mean ($\bar{X}$)) and dispersion (minimum, maximum and standard deviation (S)) [27].

Subsequently, the exploratory factor analysis was elaborated by the principal component method with varimax rotation in order to evaluate the factorial structure of the academic self-efficacy scale. In this context, Kaiser-Meyer-Olkin (KMO) values were calculated and Bartlett's sphericity test was estimated [27]. Cronbach's Alpha coefficient was calculated to analyse the internal consistency of the scale {28}.

To compare academic self-efficacy considering two or more (k) independent samples, the Mann-Whitney and Kruskal-Wallis tests were used, respectively [27]. The Mann-Whitney test enables testing the null hypothesis of the equality of medians ($H_0: \eta_1 = \eta_2$) against the alternative hypothesis of being different ($H_1: \eta_1 \neq \eta_2$). The Kruskal-Wallis test enables testing the null hypothesis of the equality of medians ($H_0: \eta_1 = \ldots = \eta_k$) against the alternative hypothesis of not all being equal ($H_1: \exists i, j: \eta_i \neq \eta_j$), where η is the median [27].

The significance level was 0.05 to which corresponds a degree of confidence (1- α) of 95%. The statistical decision rule is to reject the null hypothesis (H_0) when the p-value or significance probability is inferior or equal to α [27].

The following hypotheses were formulated:

> H_{01}: Students show similar levels of academic self-efficacy taking into account the sociodemographic factors (gender, age and nationality).

> H_{02}: Students show similar levels of academic self-efficacy regardless the academic factors (scientific area of the degree, type of degree, year of attendance, degree with or without integrated internship and attendance regimen).

3 RESULTS

According to the results of the validity and reliability analysis, it was verified the efficiency of the original scale of academic self-efficacy, which involved ten items (Table 2). In fact, the Cronbach Alpha reliability coefficient was 0.924. In a study, also conducted in Portugal, the structure of the academic self-efficacy scale consisted on a single factor and the internal consistency obtained was 0.93 [26]. The values of Cronbach's Alpha coefficient higher than 0.9 mean that the measurement tool used has good internal consistency [28]. Additionally, Bartlett's sphericity test suggests that the correlation matrix is different from an identity matrix (p-value = 0.000) which indicates variables are correlated and therefore are appropriate for structure detection. Finally, the KMO test registered a value of 0.976 indicating the proportion of variance in the variables that might be caused by underlying factors. Since the KMO value is close to 1.0, it indicates that a factor analysis may be useful.

Table 2. Results of exploratory factor analysis by principal component method and varimax rotation.

Academic self-efficacy scale items	Loadings
1. I consider myself sufficiently qualified to successfully meet any homework	0.647
2. I think I have a strong ability to understand the matter well and quickly	0.832
3. I feel confident in addressing situations that put my school skills to the test	0.860
4. I believe I can take exams with excellent results	0.784
5. It is indifferent to me that teachers are demanding and rigorous, because I trust my own school skills	0.772
6. I am a well-qualified and competent person in my school life	0.846
7. I have sufficient capacity for a good school performance	0.825
8. I believe that I will pass the year quite easily, including having good grades	0.824
9. I am one of those people who needs to study hard to do a course or to pass the year	0.604
10. I am prepared and quite capable to achieve many school successes	0.783

KMO = 0.976; Bartlett's sphericity test (p-value) = 0.000; One factor; Eigenvalue = 6.115; Variance explained = 61.146; Cronbach Alpha = 0.924; n =10

The findings obtained from the data analysis related to the academic self-efficacy of higher education students are shown in Table 3. The average scores for each item and for global academic self-efficacy scale are presented. It may be observed that the global level of academic self-efficacy is moderate ($\bar{X}$= 4.42; S = 0.092). The item with the highest self-efficacy level was "7. I have sufficient capacity for a good school performance" ($\bar{X}$= 4.54; S = 0.350) and the lower score was "9. I am one of those people who needs to study hard to get a degree or to pass the year" ($\bar{X}$= 4.24; S = 0.470).

Table 3. Mean ($\bar{X}$), standard deviation (S) and level of academic self-efficacy scale items.

Items	$\bar{X}$	S	Level
1. I consider myself sufficiently qualified to successfully meet any homework	4.53	0.740	High
2. I think I have a strong ability to understand the matter well and quickly	4.40	0.310	Moderate
3. I feel confident in addressing situations that put my school skills to the test.	4.46	0.312	High
4. I believe I can take exams with excellent results	4.46	0.460	High
5. It is indifferent to me that teachers are demanding and rigorous, because I trust my own school skills	4.25	0.425	Moderate
6. I am a well-qualified and competent person in my school life.	4.46	0.322	High
7. I have sufficient capacity for a good school performance	4.54	0.350	High
8. I believe that I will pass the year quite easily, including having good grades	4.37	0.355	Moderate
9. I am one of those people who needs to study hard to get a degree or to pass the year	4.24	0.470	Moderate
10. I am prepared and quite capable to achieve many school successes	4.41	0.376	Moderate
Global	4.42	0.092	Moderate

Fig. 1 shows the distribution of the students considering the level of academic self-efficacy. As can be observed, 45.5% of the students registered a high level of academic self-efficacy; 17.9% revealed a low level; and the remaining 36.6% showed a moderate level.
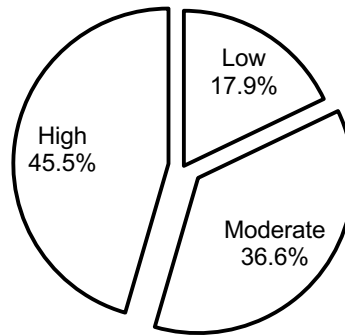
Figure 1. Students distribution by level of academic self-efficacy.

Moreover, students' academic self-efficacy was compared taking into account sociodemographic factors namely, gender, age and nationality; and, academic factors such as scientific area of the degree course, type of degree, year attended, degree with or without integrated internship, and attendance regimen (Table 4).

Table 4. Academic self-efficacy level according to sociodemographic and academic factors.

Factors	*Categories*	*Mean ranks*	*p-value*
Gender	Female	1068.45	0.269
	Male	1039.06	
Age	From 17 to 20 years old	1048.00	0.523
	More than 20 years old	1065.00	
Nationality	Portuguese	1023.20	0.041*
	Other	1094.14	
Scientific area	Education Sciences	1027.23	0.004*
	Technological sciences and management	1144.52	
	Agriculture sciences	1008.85	
	Health Sciences	1073.59	
Type of degree	Professional Higher Technological Course	1006.04	0.162
	Graduation	1039.17	
	Postgraduate	1015.92	
	Master	1213.54	
Year attended	1st year	1080.04	0.177
	2nd year	1042.47	
	3rd year	1045.29	
	4th year	892.12	
Degree with integrated internship	Yes	1048.57	0.449
	No	1022.17	
Attendance regimen	Ordinary	1194.77	0.043*
	Student worker	1051.27	

* There are statistically significant differences at a significance level of 5%.

The comparison analysis demonstrates the existence of statistically significant differences taking into account the nationality of students (p-value = 0.041). The foreign students registered a highest level of academic self-efficacy. Other sociodemographic factors such gender and age showed not to be differentiating factors of the academic self-efficacy level (Table 4).

Concerning the academic factors, the results showed that there were statistically significant differences in academic self-efficacy level taking into account the scientific area of the degree course (p-value = 0.004) and attendance regimen (p-value = 0.043). Students of the Technology and Management scientific area as well as the student worker have a higher level of academic self-efficacy (Table 4). The

level of academic self-efficacy was the same taking into account academic factors such: type of degree, year attended and degree with or without integrated internship (Table 4).

4   CONCLUSION

This research aimed to analyse the level of academic self-efficacy in students attending a public higher education institution located in the Northeast Portugal. In this study, the level of academic self-efficacy was overall moderate. However, 17.9% of the students had low levels of academic self-efficacy The item on the academic self-efficacy scale, which recorded the lowest average value was "I am one of those people who needs to study hard to get a degree or to pass the year". Similar results were obtained in a study that involved students attending a public higher education institution located in central Portugal [29].

In this study, academic self-efficacy revealed statistically significant differences according to sociodemographic factors. In fact, the foreign students had a higher academic self-efficacy level. However, sociodemographic factors such gender and age, revealed not to be differentiating factors of the academic self-efficacy level. These results are consistent with some researches [13,30] and contradictory with other researches in which male students have higher levels of academic self-efficacy [19,31-34].

Regarding academic factors, the results showed that there were statistically significant differences in the academic self-efficacy level considering the scientific area of the degree course that students attended and the attendance regimen. However, the level of academic self-efficacy was the same taking into account factors such: type of degree, year attended, and degree with or without integrated internship. Concerning the academic factors, several researches revealed statistically significant differences in students' academic self-efficacy level when the year attended was considered [13,31,33,35]. In fact, in these researches, students in the most advanced years registered a higher level of academic self-efficacy. On the other hand, the results of this study contradict those obtained by a research [19] in which statistically significant differences were found taking into account the scientific area of the degree course attended by students. Students who attended degrees from Technological Sciences and Management scientific area registered higher academic self-efficacy levels compared to students attending degree courses from Agriculture, Health and Education scientific areas.

Students' confidence in their ability to succeed in academic tasks will influence their level of involvement in activities, as well as their aspirations, interests and lifelong learning [33]. Students who have a low level of academic self-efficacy deserve special attention and effort from the higher education institution. Student academic self-efficacy can be improved if academic institutions create personalized conditions and offer individualized training customized to the needs and knowledge of each student [2].

As previously stated, this research is a cross-sectional study, which constitutes a limitation of the study. In future research, a longitudinal approach should be carried out in order to follow-up students over time to better understand the process of improving academic self-efficacy. Furthermore, given that the literature suggests a positive association between academic self-efficacy and academic performance, the causality interaction can be researched in the future.

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