Students' Perception of Self-efficacy and Academic Engagement in School of Health of the Polytechnic Institute of Porto: an Observational Study

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***Abstract**: The intense increase in students in Higher Education, observed in recent decades, has promoted profound changes quantitative and qualitative in demand, frequency, and student profile. In the context of these changes, we conducted a study to evaluate the self-efficacy and academic engagement of students using an online questionnaire. It includes some sociodemographic variables and the Self-Efficacy Scale in Higher Education (AEFS) and University Student Engagement Inventory (USEI). It was possible to verify that students had a score for academic engagement above the average, revealing an overall high level of academic engagement, an indicator of student success. Regarding self-efficacy, the score obtained is above 4 (on a scale of 1 to 5), close to 5, in social interaction, which indicates that these students overall have relatively robust self-efficacy beliefs. In all cases, the low values of standard deviation reveal a good degree of agreement between responses.*

Keywords. Higher education, students, academic performance, self-satisfaction, USEI, AEFS

University of Maribor Press

DOI https://doi.org/10.18690/um.3.2022.9
ISBN 978-961-286-658-7

1 Introduction

Higher education is changing rapidly in different directions. The students profile is being increasingly diverse, reinforcing the need for new ways of understanding student experience to ground policy and practice (Kahu & Nelson, 2018). From an institutional perspective it is almost imperative to identify the best conditions for academic success and find strategies that prevent students from dropping out of their school career (e.g., Maroco et al., 2016).

First step could be to identify and evaluate the dimensions that can compromise students' academic engagement and performance and in some even cause attrition. Several studies show that students' study performance (or academic performance) can be influenced by, for example, the environment in which they operate (Salanova et al., 2010), past performance (Elias & MacDonald, 2007), actual skills (Brown et al., 2008), and health (Trockel, Barnes, & Egget, 2000). Sometimes in the same classroom some students are involved, engaged, and motivated for schoolwork and others are disengaged and apathetic. There are no single ''right'' answers for this chronic problem in education. Teachers at all levels, are always concerned with increasing student engagement and learning.

Some researchers focus on student agency and motivation as factors in engagement (Schuetz, 2008). Others highlight the way educators practise and relate to their students (Kuh, 2001) and the roles of institutional structures and cultures (Porter, 2006). Yet others spotlight the socio-political context in which education and engagement take place (McMahon and Portelli, 2004) and the impact on students of environmental factors such as family background and economic status (Law, 2005).

Bryson (2014) suggests that student engagement is a black box and draws on a metaphor of quantum mechanics to argue that the complexity of student engagement is such that we cannot measure or map all its properties. Like Kahu (2013) argue that institutional factors and structural factors in a student's background are related to student engagement, and engagement results from the complex interplay between factors.

Nowadays, there is no unanimity among researchers. First studies on engagement had their origins in organizational and occupational areas (Schaufeli et al, 2002a; 2002b), conceptualized as being the opposite of burnout, constituting the two poles of the same continuum. Schaufeli et al. (2002b), for their part, conceptualized the engagement as a positive, persistent and comprehensive affective-cognitive state, which is characterized for stamina – high energy levels, mental toughness, willingness to invest effort in professional activity and persistence in the face of difficulties at work; dedication – strong engagement in work, enthusiasm, pride, audacity and inspiration in the performance of the professional function; and absorption - "immersion" and total concentration on what you are doing.

Student engagement has been linked to an array of traditional success factors such as increased retention (Khademi et al., 2018); academic achievement, high impact and lifelong learning (Artess et al., 2017), curricular relevance, enhanced institutional reputation, increased citizenship behaviours, student perseverance and work-readiness (Khademi et al., 2018). It has also been linked to more subjective and holistic outcomes for students themselves including social and personal growth and development, transformative learning (Kahu 2013);

enhanced pride, inclusiveness and belonging (Wentzel, 2012); student wellbeing (Almeida et al., 2012; Fredericks et al., 2004). Engagement has been defined as 'the quality of effort students devotes to educationally purposeful activities that contribute directly to desired outcomes' (Hu & Kuh 2002, 555). Most definitions of student engagement cover the emotional, behavioural and cognitive engagements (Coates, 2006; Fredricks et al., 2004) and "agentic engagement" (Reeve & Tseng, 2011).

Fredricks et al. (2004) propose a model that considers academic engagement as a three-dimensional construct, which includes the behavioral, emotional, and cognitive dimensions. The engagement behavior is manifested by the student's participation in academic activities, social and extracurricular activities that take place at school or are related to it; emotional engagement reflects positive and negative reactions to teachers, peers and school requirements, particularly in relation to the course and codes of conduct, building bonds with school and peers, and willingness to do required schoolwork; and finally, cognitive engagement manifests itself in the investment and willingness to make the necessary efforts to understand and internalize complex ideas and skills with a high degree of difficulty (Fredricks et al., 2004; Fredricks & McColskey, 2013; Maroco et al., 2016). Student engagement have been nonetheless considered the strongest predictors of students' performance, as well as self-efficacy beliefs (Richardson, Abraham & Bond, 2012).

Literature confirms the positive relationship between self-efficacy and engagement as well. Self-efficacy leads to a greater willingness to expend additional energy and effort on completing a task or an assignment, and hence to more task engagement and absorption (Ouweneel et al., 2011). Efficacious students are more likely to regulate their motivation by setting goals for themselves (Diseth, 2001), and are therefore more likely to be engaged (Howell, 2009). They tend to try other options when they do not achieve their goals at first, they expend high levels of effort in doing so, and deal more effectively with problematic situations by persevering and remaining confident that they will find solutions and be successful in the end. Therefore, generally, they perform well (Bandura, 1997). Moreover, this seems to be stable across different ages for all students in elementary, junior high, high school, and college classrooms. It seems to apply equally to males and females and all ethnic groups (Pintrich & Schunk, 1996).

Students' efficacy beliefs can be altered and promoted in several ways: by mastery experiences, vicarious learning, social persuasion, and specific psychological states (Bandura 1997). In meta-analyses, self-efficacy has emerged as a strong predictor of motivation, persistence, and performance over time, in different environments and populations (Bandura, 2006; Elias & MacDonald, 2007; Azzi & Polydoro, 2010).

Bandura's (1986) sociocognitive theory defines self-efficacy as the individual's perceptions of their ability to perform a task. Social cognitive theory views human functioning in a transactional way, depending on reciprocal interactions between an individual's behaviours, their internal personal factors (e.g., thoughts and beliefs), and environmental events (Bandura, 1986, 1997). An analysis of students' self-efficacy beliefs is very important to understand how their actions, insofar as the subject is able to perform, but what they believe they can perform (Schunk, 1995, 2003; Bandura, 1986). Such belief has been associated with

the development of critical thinking, to the value assigned to the task, to self-regulated learning, to the performance of students, engagement with the course, academic persistence and integration into the higher education (Guerreiro-Casanova & Polydoro, 2011; Mascarenhas et al., 2013).

According to Jones (2010), students, depending on their self-efficacy perceptions, can adopt three behavioral alternatives: investing in the task, spending the necessary effort to be successful; consider that success depends only on the superior capabilities you have; or avoid work, thinking that success in school is easy to achieve, so it is not necessary to make a great effort. For Gore (2006) experiences of success or failure are associated with strong or weak beliefs of personal effectiveness and are predictive of performance for university students. Zusho and Pintrich (2003) add that these beliefs may fluctuate throughout the year as a result of the numerous performance feedback given to students, with low-achieving students reporting less confidence than high-achieving students. The latter, in turn, attach greater value to their learning.

Research data reveal that students, who usually believe that are capable of performing the proposed academic tasks, use more cognitive and metacognitive strategies in their academic work and set more challenging goals than those students who build beliefs adverse to school investment. This achievement behavior, in turn, influences personal variables, because as a student progresse in a task (behavior), he mentally records his progress, and this record conveys the feeling that he is capable of learning, reinforcing, thus, their perceptions of self-efficacy in that task and similar tasks (Bandura, 1986, 1997).

According to Chen and Zimmerman (2007), the harmony between self-efficacy and performance is fundamental and promotes the regulation of behavior**.** Students who self-regulate their learning usually show robust self-efficacy in the different curricular units, that is, they believe more that they can learn or perform behaviors according to what is required and expected; this being a key variable in the students' self-regulatory process. Students with high self-efficacy, as stated by Zimmerman (2000), tend to be more persistent, to choose difficult tasks, to control their anxiety by resorting more to self-regulatory processes, such as setting goals, defining, and selecting strategies, self-monitoring and self-assessment.

The purpose of this work was to evaluate the self-efficacy and academic engagement of students at School of Health Polytechnic Institute of Porto (ESS|P.Porto), as well as to correlate the level of self-efficacy and academic engagement with academic success.

2 Methodology

This was an analytical cross-sectional study. The study project was previously submitted for analysis by the Ethics Committee of the ESS|P.Porto, having received a favorable opinion. Participants were recruited through institutional emails, where were request for collaboration to respond the questionnaire available via Google forms, the link was included in the body of the text of the email sent, without identifying data, which include some sociodemographic variables and the instruments Self-Efficacy Scale in Higher Education (EAFS) and University

Student Engagement Inventory (USEI). The inclusion criteria were being of legal age and student at ESS|P.Porto. There are no specific exclusion criteria other than situations if most part of the questionnaire was not completed.

The information collected and the respective procedures will comply the Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016. The pseudo-anonymization process will be guaranteed by the absence of registration and collection of data identifying the participants, so that the data collected cannot be attributed to a particular person, thus guaranteeing their confidentiality. The data obtained were descriptively and inferential analyzed, and statistically significant differences were considered for an α of 0.05.

3 Results

3.1 Sample characterisation

In our study, 105 answers were obtained, however, 3 participants were excluded because they were Master's degree students and were not the target of our study. Thus, our sample is composed of 102 respondents, mostly female, 83.3% (n=85), aged between 18 and 46 years (Fig.1), with a mean age of 22±4 years.

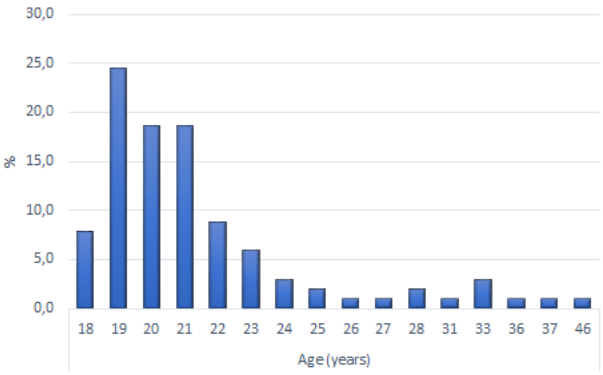

Figure 1. Distribution of ages of study participants, in percentage.

In relation to the level of education of the students' parents, it was found that for the mothers the most frequent level of education is secondary education and second cycle, both with 26.5%, followed by higher education with 18.6%. In the case of the fathers, the most frequent level of education was secondary education with 28.4%, followed by secondary education with 26.5% and third level with 20.6% (Fig. 2).

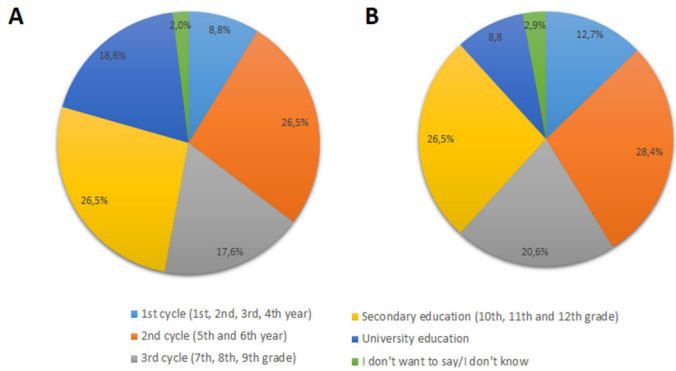

Figure 2. Academic qualifications of the students' parents. A) Academic qualifications of the mother, B) Academic qualifications of the father.

Our study included students from 11 four-year degree courses at ESS|P.Porto; the distribution by course is shown in Fig. 3 (A). For most students, 52.9% (n=54), their course was their first choice. In Fig. 3B we can highlight that most respondents are attending their second year of study (41.2%; n=42).

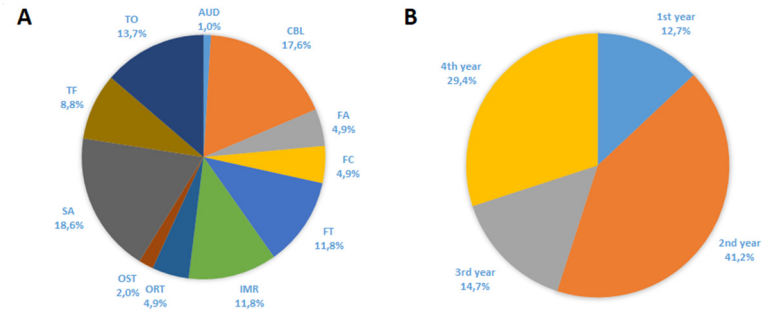

Figure 3. Distribution of students by course (A) and by year of study (B). A sample n of 102 and B sample n of 100. AUD - Audiology, CBL - Biomedical Laboratory Sciences, FA - Pharmacy, FC - Clinical Physiology, FT - Physiotherapy, IMR - Medical Imaging and Radiotherapy, ORT - Orthotics, OST - Osteopathy, SA - Environmental Health, TF - Speech Therapy, TO - Occupational Therapy

Only 7.8% (n=8) of our sample has overdue Curricular Units, seven students have only one overdue Curricular Unit and one student two. Regarding the course average the majority of students 51.0% (n=52) presents an average between 14 and 15.9 points, followed by 33.3% of the sample with an average between 12 and 14.9 points. In the question if the course is meeting expectations 80.4% (n=82) of the students said yes.

3.2 Self-Efficacy Scale Higher in Education

The instrument AEFS comprises 20 response items on a 6-position scale where 1 corresponds to not at all confident and 6 totally confident. We obtained an n=102 for each item. Table 1 shows that most questions do not cover the entire range of answers, with the most common

answers variation being between 2 and 6. The mean of answers varies between the minimum value 3.79±0.79 in item 19 and the maximum value of 5.39±0.83 in item 14. We also highlight those items 7,10,11,13 and 14 have mean values higher than 5.

Table 1. Results obtained for each item: minimum, maximum, mean, standard deviation, asymmetry, kurtosis.

Items	Min	Max	Average	Standard deviation	Asymmetry	Kurtosis
It1	2	6	4.47	0.82	-0.29	0.05
It2	1	6	4.02	0.97	-0.51	0.28
It3	2	6	4.32	0.87	-0.22	-0.06
It4	1	6	4.97	1.08	-1.25	1.73
It5	2	6	4.25	0.84	-0.41	0.24
It6	1	6	4.25	0.99	-0.83	0.75
It7	2	6	5.04	0.95	-0.85	0.19
It8	2	6	4.52	0.90	-0.81	0.89
It9	1	6	4.41	0.97	-1.05	2.36
It10	2	6	5.17	0.86	-1.00	1.08
It11	1	6	5.01	0.98	-1.12	1.75
It12	1	6	4.4	1.20	-0.72	0.16
It13	2	6	5.02	0.91	-0.92	1.00
It14	2	6	5.39	0.83	-1.58	2.75
It15	1	6	4.68	1.14	-1.23	1.87
It16	1	6	4.38	1.22	-0.41	-0.53
It17	2	6	4.88	1.11	-0.78	-0.07
It18	2	5	3.96	0.77	-0.46	0.03
It19	1	5	3.79	0.79	-0.73	1.76
It20	1	5	3.89	0.78	-0.57	0.92

Table 2 shows the statistics for each dimension of the questionnaire: Academic Self-efficacy, Self-efficacy in regulating training and Self-efficacy in social interaction. The highest mean value was obtained in the dimension Self-efficacy in social interaction with 4.91±0.72. From the data obtained by the Kolmogorov-Smirnov test, it appears that the responses obtained in each dimension do not follow a normal distribution (p-value $<\alpha$ 0.05).

We also calculated the global score (average) of the questionnaire, obtained 4.54±0.60.

Table 2. Statistics values (average, standard deviation and normality Kolmogorov-Smirnov test) for each dimension of the questionnaire.

Dimensions	Average (Score)	Standard deviation	Kolmogorov-Smirnov p value
Academic self-efficacy (Items1,2,3,5,6,8,9)	4.32	0.70	0.007
Training regulation self-efficacy (Items 11,12,14,15,18,19,20)	4.45	0.67	0.009
Self-efficacy in social interaction (Items 4,7,10,13,16,17)	4.91	0.72	0.010

Using non-parametric statistical tests, we studied the existence of a relationship between the results obtained in each dimension of this questionnaire and the independent variables: gender, housing situation during term time, mother and father's academic qualifications, course attended, course of first choice, year of study in which the student is enrolled, existence of course units in arrears, course average, course meeting the student's expectations. The results obtained are shown in Table 3.

Table 3. Results of non-parametric tests between each questionnaire dimension and independent variables. Statistically significant differences between groups are signed with * for a α of 0.05.

Independent variables	**Dimension**	**Statistical test used**	**P value**
Sex	Academic self-efficacy	Teste U de	0.649
	Training regulation self-efficacy	Mann-Whitney	0.033*
	Social interaction self-efficacy		0.624
Housing situation during school time	Academic self-efficacy	Teste de	0.780
	Training regulation self-efficacy	Kruskal-Wallis	0.780
	Social interaction self-efficacy		0.107
Mother's academic qualifications	Academic self-efficacy	Teste de	0.631
	Training regulation self-efficacy	Kruskal-Wallis	0.383
	Social interaction self-efficacy		0.153
Father's academic qualifications	Academic self-efficacy	Teste de	0.834
	Training regulation self-efficacy	Kruskal-Wallis	0.750
	Social interaction self-efficacy		0.096
Course attended	Academic self-efficacy	Teste de	0.006*
	Training regulation self-efficacy	Kruskal-Wallis	0.102
	Social interaction self-efficacy		0.784
Was this course your first choice?	Academic self-efficacy	Teste U de	0.547
	Training regulation self-efficacy	Mann-Whitney	0.727
	Social interaction self-efficacy		0.968
In which year of the course are you enrolled?	Academic self-efficacy	Teste de	0.128
	Training regulation self-efficacy	Kruskal-Wallis	0.261
	Social interaction self-efficacy		0.859
Do you have overdue course units?	Academic self-efficacy	Teste U de	0.856
	Training regulation self-efficacy	Mann-Whitney	0.541
	Social interaction self-efficacy		0.023*
Current course average	Academic self-efficacy	Teste de	<0.001*
	Training regulation self-efficacy	Kruskal-Wallis	0.011*
	Social interaction self-efficacy		0.007*
Is the course meeting your expectations?	Academic self-efficacy	Teste U de	<0.001*
	Training regulation self-efficacy	Mann-Whitney	<0.001*
	Social interaction self-efficacy		0.007*

Table 3 shows statistically significant differences between the results obtained in some dimensions of the AEFS questionnaire and certain independent variables. Table 4 shows the means, standard deviations, and sample n for each group within each variable, in the dimensions where statistically significant differences were found for an α of 0.05.

Table 4. Results of means, standard deviations, and sample n for each group within each variable where statistically significant differences were found.

Independent variable	**Dimension**	**Mean± Standard Deviation (n)**
Sex	Self-efficacy in regulating training	Female: 4.52±0.61 (85) Male: 4.10±0.84 (17)
Course you are attending	Academic self-efficacy	CBL: 4.37±0.70 (18) FA: 4.46±0.75 (5) FC:4.14±0.42 (5) FT: 3.54±0.68 (12) IMR:4.20±0.82 (12) ORT:5.06±0.39 (5) OST:4.64±0.10 (2) SA: 4.45±0.65 (19) TF: 4.41±0.41 (9) TO: 4,53±0,56 (14)
Do you have overdue course units?	Social interaction self-efficacy	Yes: 4.40±0.56 (8) No: 4.95±0.72 (94)
Current course average	Academic self-efficacy	Between 10 and <12: Not applicable (1) Between 12 and <14: 4.13 ± 0.62 (34) Between 14 and <16: 4.51 ± 0.59(50) Between 16 and <18: 4.56±0.85(10) Don't want to answer/Don't know: 3.23±0.79 (5)
	Training regulation self-efficacy	Between 10 and <12: Not applicable (1) Between 12 and <14: 4.24 ± 0.57 (34) Between 14 and <16: 4.64 ± 0.52 (52) Between 16 and <18: 4.61±0.72(10) Don't want to answer/Don't know: 3.57±1.41 (5)
	Social interaction self-efficacy	Between 10 and <12: Not applicable (1) Between 12 and <14: 4.76 ± 0.64 (34) Between 14 and <16: 5.04 ± 0.65 (52) Between 16 and <18: 5.33 ± 0.58 (10) Don't want to answer/Don't know: 3.83±1.14 (5)
Is the course meeting your expectations?	Academic Self-efficacy	Yes: 4.51±0.50 (82) No: 3.54±0.87 (20)
	Training regulation self-efficacy	Yes: 4.58 ± 0.52 (82) No: 3.89±0.89 (20)
	Social interaction self-efficacy	Yes: 5.03±0.60 (82) No: 4.42±0.97 (20)

Legend: AUD - Audiology, CBL - Biomedical Laboratory Sciences, FA - Pharmacy, FC - Clinical Physiology, FT - Physiotherapy, IMR - Medical Imaging and Radiotherapy, ORT - Orthotics, OST - Osteopathy, SA - Environmental Health, TF - Speech Therapy, TO - Occupational Therapy

3.3 University Student Engagement Inventory

University student academic engagement inventory comprises 15 response items on a 5-position scale where 1 corresponds to never and 5 always. We obtained an n=102 for each item. Table 5 presents the results obtained for each item in terms of minimum, maximum, mean, standard deviation, asymmetry, kurtosis. We observe that most of the questions are distributed throughout the response scale, except for items 2,5,14,15. Mean responses range from a minimum value of 2.46±1.25, in item 6 to a maximum of 4.57±0.55 in item 2.

Table 5. Results obtained for each item: minimum, maximum, mean, standard deviation, asymmetry, kurtosis.

Items	Min	Max	Average	Standard deviation	Asymmetry	Kurtosis
It1	1	5	3.78	0.61	-0.94	3.50
It2	3	5	4.57	0.55	-0.81	-0.39
It3	1	5	4.37	0.83	-1.32	1.75
It4	1	5	3.59	0.98	-0.45	-0.29
It5	2	5	4.49	0.73	-1.22	0.60
It6	1	5	2.46	1.25	0.40	-0.97
It7	1	5	3.44	0.97	-0.46	0.05
It8	1	5	3.78	0.93	-0.69	0.41
It9	1	5	3.67	0.95	-0.85	0.88
It10	1	5	3.33	1.00	-0.41	0.10
It11	1	5	3.69	1.00	-0.62	0.10
It12	1	5	3.78	0.98	-0.71	0.37
It13	1	5	4.32	0.79	-1.40	2.85
It14	2	5	4.09	0.72	-0.30	-0.48
It15	2	5	4.08	0.75	-0.70	0.59

Table 6 shows the statistics for questionnaire each dimension: Behavioural Engagement, Emotional Engagement and Cognitive Engagement. The highest mean value was obtained in the dimension Behavioural Engagement with 4.16±0.46. According to the Kolmogorov-Smirnov test, the answers obtained in each dimension did not follow a normal distribution (p-value $<\alpha$ 0.05). We obtained a questionnaire global score (average) of 3.83±0.42.

Table 6. Statistics values (average, standard deviation, and normality Kolmogorov-Smirnov test) for each dimension of the questionnaire.

Dimensions	Average (Score)	Standard deviation	Kolmogorov-Smirnov p value
Behavioural Engagement (items 1-5)	4.16	0.46	<.001
Emotional Engagement (items 6-10)	3.34	0.55	<0.001
Cognitive Engagement (items 11-15)	3.34	0.55	0.008

Similarly, to the AEFS questionnaire, we used non-parametric statistical tests in order to study the relationship between the results in each dimension of the USEI questionnaire and the independent variables: gender, housing situation during the school period, mother's and

father's academic qualifications, the course attended, the course of first choice, the year in which the student is enrolled, the existence of course units in arrears, the course average, and whether the course meets the student's expectations. The results obtained are shown in Table 7. The analysis of this table shows that there are statistically significant differences between the results obtained in some dimensions of the questionnaire and certain independent variables. To be able to detail these differences, Table 8 shows the means, standard deviations and sample n for each of the groups within each variable, in the dimensions in which statistically significant differences were observed for an α of 0.05.

Table 7. Results of non-parametric statistical tests between each dimension of the questionnaire and independent variables.

Independent variables	**Dimension**	**Statistical test used**	**P value**
Sex	Behavioural Engagement	Teste U de	0.664
	Emotional Engagement	Mann-Whitney	0.913
	Cognitive Engagement		0.629
Housing situation	Behavioural Engagement	Teste de Kruskal-	0.884
during school time	Emotional Engagement	Wallis	0.781
	Cognitive Engagement		0.391
Mother's academic	Behavioural Engagement	Teste de Kruskal-	0.943
qualifications	Emotional Engagement	Wallis	0.717
	Cognitive Engagement		0.045*
Father's academic	Behavioural Engagement	Teste de Kruskal-	0.399
qualifications	Emotional Engagement	Wallis	0.685
	Cognitive Engagement		0.580
Course attended	Behavioural Engagement	Teste de Kruskal-	0.229
	Emotional Engagement	Wallis	0.197
	Cognitive Engagement		0139
Was this course your	Behavioural Engagement	Teste U de	0.697
first choice?	Emotional Engagement	Mann-Whitney	0.919
	Cognitive Engagement		0.233
In which year of the	Behavioural Engagement	Teste de Kruskal-	0.406
course are you enrolled?	Emotional Engagement	Wallis	0.002*
	Cognitive Engagement		0.760
Do you have overdue	Behavioural Engagement	Teste U de	0.990
course units?	Emotional Engagement	Mann-Whitney	0.171
	Cognitive Engagement		0.310
Current course average	Behavioural Engagement	Teste de Kruskal-	<.001*
	Emotional Engagement	Wallis	0.212
	Cognitive Engagement		0.006*
Is the course meeting	Behavioural Engagement	Teste U de	.006*
your expectations?	Emotional Engagement	Mann-Whitney	0.006*
	Cognitive Engagement		0.014*

Legend: Statistically significant differences between groups are signed with * for a α of 0.05.

Table 8 - Results of means, standard deviations, and sample n for each group within each variable where statistically significant differences were found.

Independent variable	Dimension	Mean± Standard Deviation (n)
Mother's Academic Qualifications	Cognitive Engagement	1st cycle: 4.38±0.31(9) 2nd cycle: 4.10±0.70 (27) 3rd cycle: 3.80±0.43 (18) Secondary education: 3.79±0.64 (27) Higher education: 4.11±0.63 (19) Don't want to say/Don't know: 4.30±0.71 (2)
In which year of the course are you enrolled?	Emotional Engagement	1st year: 3.49±0.52 (13) 2nd year: 3.28±0.56 (42) 3rd year: 3.71±0.38 (15) 4th grade: 3.18±0.56 (30)
Current course average	Behavioural Engagement	Between 10 and <12: Not applicable (1) Between 12 and <14: 3.94 ± 0.48 (34) Between 14 and <16: 4.31 ± 0.36 (52) Between 16 and <18: 4.34 ± 0.43 (10) Don't want to answer/Don't know: 3.88±0.50 (5)
	Cognitive Engagement	Between 10 and <12: Not applicable (1) Between 12 and <14: 3.82 ± 0.65 (34) Between 14 and <16: 4.14 ± 0.52 (52) Between 16 and <18: 4.26±0.65 (10) Don't want to answer/Don't know: 3.28±0.46 (5)
Is the course meeting your expectations?	Behavioural Engagement	Yes: 4.23 ± 0.41 (82) No: 3.88±0.54 (20)
	Emotional Engagement	Yes: 3.41 ± 0.53 (82) No: 3.02±0.52 (20)
	Cognitive Engagement	Yes: 4.07±0.57 (82) No: 3.67±0.72 (20)

Legend: AUD - Audiology, CBL - Biomedical Laboratory Sciences, FA - Pharmacy, FC - Clinical Physiology, FT - Physiotherapy, IMR - Medical Imaging and Radiotherapy, ORT - Orthotics, OST - Osteopathy, SA - Environmental Health, TF - Speech Therapy, TO - Occupational Therapy

4 Discussion

The sample under study is mostly composed of female students (83.3%), which is in line with the trend of higher female expression seen in recent years as a result of universalization of the right to education and the massification that began in higher education in the 1960s and was reinforced after the 25th of April 1974 (Dias, 2015). On the other hand, it is in line with the student universe of ESS|P.Porto.

It was found that the average age is 22 years old, suggesting that most students enter higher education after concluding secondary or vocational education. Considering that the study was conducted on undergraduate students, the average age is appropriate. We must highlight the age distribution between 18 and 46 years old, revealing the impact of the special

access route to higher education that allows the application of professional, higher technical courses and undergraduate degrees for those over 23, as established by Decree-Law 64/2006.

The level of education of the parents of the surveyed students differs according to their gender. In the case of mothers, it corresponds mostly to secondary and lower secondary education (both 26.5%), followed by higher education (18.6%), while 28.4% of fathers have lower secondary education and 26.5% have upper secondary education. Compared to mothers, only 8.8% have a higher education. Overall, despite the positive evolution, it is likely that the full democratization of this level of education has not yet been achieved (Dias, 2015; Cerdeira & Cabrito 2018).

In the responses obtained, 11 undergraduate courses out of the 12 existing at ESS|P.Porto are represented. The courses with the highest frequency of answered questionnaires were Environmental Health (SA), Biomedical Laboratory Science (CBL) and Occupational Therapy (OT) (Fig. 2A). Most respondents are attending the course they chose as their first option (52.9%), and 41.2% are attending the second curricular year.

At the time of the study, the vast majority (92.2%) had no curricular units (CU) in arrears, and when this happened, only eight students (7.8%) had unapproved CU, almost exclusively one. The course grade, at present for most students (51.0%), is between 14 and 15.9, 33.3% have a lower grade, and 9.8% have a grade between 16 and 18. In view of these rates, we can consider this a good academic performance. Theoretically, it is expected that the higher the self-efficacy in an area, the greater the success in performing it (Vieira et al., 2017).

For 80.4% of the respondents, the course they attended met their expectations. In this context, and although the justifying answers were scarce, it was the students attending the 2nd curricular year who expressed themselves the most. They are related to the diversified perspective of the course performance area (CBL) and the several professional outlets (SA), the practical component that allows the acquisition of skills for the labour world (FT), the proximity of the teachers, allowing the clarification of doubts, and the interconnection of contents within the same CU, of increasing complexity to promote intellectual and pedagogical growth (FT). Those who considered that the course fell short of their expectations considered that some topics did not seem useful for the future work context (SA), the topics were dealt with in a superficial way (TO) and there was a feeling of not being prepared to intervene in a therapeutic context with the desired effectiveness (TO). The workload was exaggerated and incompatible with work-life balance, associated with a lack of organization and justified by the PBL teaching method (FT). In addition, there is some difficulty in keeping up with the classes (FT). Although some respondents answered "Yes", they also highlight the need for greater organization between course units (FT), greater practical focus, and the existence of CUs that do not fit into the course (ORT) as well as the overvaluation of one component over the others (IMR).

The AEFS aims to assess the student's confidence in his/her ability to succeed in the tasks arising from attending higher education. Divided into three dimensions: academic self-efficacy, self-efficacy in regulating training, and self-efficacy in social interaction, it shows that

the higher the score in each dimension, the higher the student's self-efficacy in the respective dimension.

According to Schunk (1994), from a sociocognitive standpoint, self-efficacy is a condition that can be regulated and adjusted, much like other learning strategies that the student may employ. The same author (1989) contends that teaching students how to use learning strategies increases self-efficacy by creating, *a posteriori*, a sense of personal control over the outcomes of activities and a sense of ability to select and implement the various learning techniques taught. In this approach, an unbreakable link between cause and effect is established.

Additionally, Vogt (2008) found a strong correlation between perceived self-efficacy, confidence, performance, and interaction with teachers. This perspective, associated with curricula, could be explored to understand the degree of influence as investigated by Jones (2010). Other studies have also revealed positive and significant correlations between perceived self-efficacy and competent performance (Schunk & Gunn, 1986), suggesting that self-efficacy promotes employability orientation (Nauta et al., 2009).

However, as DiBenedetto and Bembenutty (2013) suggest, in the future, the contributing elements to the decrease in self-efficacy along the university academic pathway should be investigated. Specifically, those that directly or indirectly influence decision-making.

The descriptive statistical analysis of the 20 items of the AEFS (Table 1) shows that in 50% of the items, the answers range from 1 to 6, using all possible response alternatives on the scale, namely in items 2, 4, 6, 9, 11, 12, 15, 16, 19 and 20. These items are mainly related to self-efficacy in training regulation and academic self-efficacy; only items 4 and 16 are related to self-efficacy in social interaction. The mean responses to the items range from a minimum value of 3.79 (SD = 0.79) in item 19 to a maximum value of 5.39 (SD = 0.83) in item 14, although items 7, 10, 11, 13, and 14 also have mean values above 5. Except for items 9 and 14, the asymmetry (Sk) and kurtosis (Ku) values are within the limits considered normal, since all absolute values are less than 2. However, normality was tested, and it was found that the responses by dimension do not follow a normal distribution (table 3).

Based on some studies conducted in this area on the Portuguese population (Polydoro et al., 2008; Vieira, 2010, 2012), we also assumed as a reference that scores ≤3 in the subscales indicate low levels of self-efficacy in the respective dimension, and that scores ≥5 correspond to robust self-efficacy in the various dimensions. In our study, the mean scores obtained were higher than 4, the highest in the dimension of self-efficacy in social interaction, with 4.91±0.72, revealing a high confidence in the ability to relate with peers and teachers. Although the results in the other dimensions are slightly lower, academic self-efficacy (4.32) and self-efficacy in regulating training (4.45), they also demonstrate a high ability, on average, to learn, demonstrate, and apply the course content, as well as to set goals, plan, meet deadlines, and self-regulate their actions during the teaching-learning process, respectively.

Considering that the sample did not follow a normal distribution in some items, possible relationships between the results obtained in each dimension and the independent variables were studied using non-parametric tests (Table 4). It was found that academic self-efficacy is related to the course attended, the current course average, and whether the course is meeting

individual expectations. Self-efficacy in regulating training is related to the student's gender, current course average, and whether the course is meeting expectations. Finally, self-efficacy in social interaction is related to the current course average and individual expectations about the course.

Thus, female students show higher self-efficacy in regulating education compared to male students (4.52 ± 0.61 and 4.10 ± 0.84, respectively). This is in line with the study by Shull & Weiner (2002), who found significant differences in the perception of self-efficacy between female and male students. The courses attended, despite being related to academic self-efficacy, had low sample values per course, so we considered that we were dealing with a very heterogeneous profile representing important possible biases. The fact that students do not have UC in arrears contributes to a level of self-efficacy in social interaction close to 5 (4.95 ± 0.72), which represents almost a robust self-efficacy in this dimension.

The current course average and whether the course is meeting expectations are the only variables that interfere with all three dimensions of the scale. In the former case, as course grades increase, self-efficacy averages increase, regardless of dimension. Of note, in social interaction self-efficacy, students with higher course grades between 14-16 and 16-18 show robust self-efficacy (5.04±0.65 and 5.33±0.58). In the second case, the fact that the course is meeting individual expectations contributes to high levels of academic self-efficacy (4.51±0.50) and training regulation (4.58±0.52) and robust self-efficacy levels in social interaction (5.03±0.60). The student academic engagement questionnaire (USEI) has three dimensions: emotional engagement, cognitive engagement, and behavioural engagement. The higher the score in each dimension, the higher student's engagement was in that dimension. It is possible to consider the midpoint or middle value of each subscale, situated at value 3, to analyse the results in comparison with this value, and they may be below or above the reference value. Therefore, the results may correspond to low and high levels of academic engagement for each of the subscales considered (Costa and Marôco, 2017).

A descriptive statistical analysis was performed for the 15 items in the inventory, summarized in Tables 6 and 7. We can see that for most items, the questionnaire is used in its entirety, in which the responses range from 1 to 5 (exception for items 2, 5, 14 and 15, whose response range is 2 to 5). The mean of the responses to the items lies between the values of 2.46 (SD = 1.25) obtained for item 6 and 4.57 (SD = 0.55) obtained for item 2. Except for items 1 and 13, the values of skewness (Sk) and kurtosis (Ku) are within the limits considered normal, as all absolute values are less than 2. However, normality was tested, and it was found that the responses by dimension do not follow a normal distribution (table 8). Behavioural engagement, in this study, is assumed to be the factor that contributes the most to student academic engagement (4.16±0.46), representing high engagement.

Using nonparametric tests, we studied possible relationships between the results obtained in each dimension and the independent variables (table 9). It was found that cognitive engagement is positively related to the mother's academic qualifications, current course average, and expectations about the course ($p<0.05$). Emotional engagement is related to the year attended and to the individual's expectation about the course ($p<0.05$), while behavioural engagement is associated with the current course average ($p<0.05$). Thus, we can

conclude that student academic engagement is most affected by the variables current course average and course expectancy because they impact all three dimensions. The current course average for students with grades between 12 and 18 contributes to high academic engagement for each of the subscales considered. As for whether the course is meeting each student's expectations, it has more impact on behavioural and cognitive engagement (4.23 ± 0.41 and 4.07 ± 0.57, respectively).

Considering that no average scores of 3 or below were obtained in this sample, we found no students at risk for poor academic performance, which demonstrates an overall high level of academic engagement. Although it is possible and desirable to develop interventions to promote greater academic success.

5 Conclusion

The sample size is the study's main limitation, given the time period. The sample size will have to be increased in the future to analyse the variables related to the various dimensions. The development of longitudinal studies may be relevant to the themes studied.

It was possible to verify that students had an average score for academic engagement above the average value (value 3), which reveals an overall high level of academic engagement, an indicator of student success. The same is true when we analyse each component separately, where the low values of the standard deviation reveal a good degree of agreement among the answers. Despite the unpretentious predictive power of the AEFS in relation to academic performance (a variable subject to multiple factors in addition to aspects of self-efficacy), the results obtained should be integrated due to their potential to explain performance. It also suggests ways to intervene preventively with students who have low levels of self-efficacy in higher education.

Regarding self-efficacy, the score obtained is above 4, and very close to 5, in social interaction, which indicates that these students overall have relatively robust self-efficacy beliefs. In all cases, the low values of standard deviation reveal a good degree of agreement between responses.

However, we must not forget that the information obtained refers to a moment of self-efficacy beliefs and does not show their dynamic nature. From this perspective, Bandura (1986) defines the main sources of self-efficacy as: experiences of success experienced or observed; verbal persuasion; and physical and emotional states. As a result, in future studies, it will be essential to recognize the current perspectives of students in order to direct future intervention efforts. In this scope, several interventions may be of added value: the development of interventions streamlined by student support office and close collaboration with course coordinators and/or the students' association; the monitoring of needs; reflection and management in the course councils, monitoring committees, and course evaluation.

On the other hand, the AEFS might be discussed in higher education instructors' pedagogical training, where the reflective examination of the AEFS items could stimulate

and/or build the teachers' intervention capacity in order to increase students' self-efficacy in academic training.

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