

Entrepreneurial Potential and Academic Engagement in College Students

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Abstract: There is currently a need for adaptation in higher education due to the new demands of society. In this context, two factors are noteworthy: academic engagement and entrepreneurial education. This study aimed to examine whether entrepreneurship education influences academic engagement and entrepreneurial potential in college students participating and not participating in entrepreneurship education programs. It is a quantitative, exploratory, and correlational study on a 563-student sample, using the Entrepreneurial Potential Identification Scale - *Escala para Identificar Potencial Empreendedor*, the Utrecht Work Engagement Scale-Students, and a sociodemographic questionnaire. The results showed that students who entered an entrepreneurial training program had significantly higher rates of academic engagement and entrepreneurial potential, when compared with academics from institutions that did not have a program designed for this purpose. It is concluded that investing in entrepreneurial education can foster the generation of more engaged students with greater entrepreneurial potential.

Keywords: education, entrepreneurship, colleges, students, involvement

Potencial Empreendedor e Engajamento Acadêmico em Estudantes Universitários

Resumo: Atualmente, há uma necessidade de adaptação na educação superior devido às novas demandas da sociedade, nesse contexto, dois fatores merecem destaque, o engajamento acadêmico e a educação empreendedora. Este estudo teve por objetivo verificar se a educação empreendedora influencia o engajamento acadêmico e o potencial empreendedor em estudantes universitários participantes e não participantes de programas de educação empreendedora. Trata-se de pesquisa quantitativa e exploratória com amostra de 563 estudantes, a qual empregou como instrumentos a Escala para Identificar Potencial Empreendedor, o *Utrecht Work Engagement Scale-Students* e um questionário sociodemográfico. Os resultados evidenciaram que estudantes inscritos em programa de formação empreendedora possuem índices significativamente maiores de engajamento acadêmico e potencial empreendedor, quando comparados a acadêmicos de instituições que não possuem um programa dedicado a esta finalidade. Conclui-se, portanto, que investir em educação empreendedora pode fomentar a geração de estudantes mais engajados e com maior potencial empreendedor.

Palavras-chave: educação, empreendedorismo, universidades, estudantes, envolvimento

Potencial Empreendedor y Compromiso Académico en Estudiantes Universitarios

Resumen: Actualmente, hay una necesidad de adaptación en la educación superior debido a las nuevas demandas de la sociedad, en este contexto, dos factores merecen atención, el compromiso académico y la educación emprendedora. El estudio tuvo como objetivo verificar si la educación emprendedora influye en el compromiso académico y en el potencial emprendedor en estudiantes que participaron y no participaron de programas de educación emprendedora; Esta es una investigación cuantitativa exploratoria y correlacional con una muestra de 563 estudiantes utilizando como instrumento la Escala para Identificar Potencial Emprendedores, el *Utrecht Work Engagement Scale-Students* y un cuestionario sociodemográfico. Los resultados muestran que estudiantes que ingresaron en programa de capacitación emprendedora poseen tasas significativamente más altas de participación académica y potencial empresarial, en comparación con académicos de instituciones que no tienen un programa dedicado para esta finalidad. Se concluye que invertir en educación empresarial puede fomentar la generación de estudiantes más comprometidos y con un mayor potencial emprendedor.

Palabras clave: educación, emprendimiento, universidades, estudiantes, envolvimento

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Education currently needs to adapt to the new demands of society, and entrepreneurial training is becoming increasingly present in its various levels (undergraduate, certificate and graduate programs), as well as in different fields of knowledge,

no longer being exclusive to business education (Cualheta, Abbad, Faiad, & Borges Junior, 2020). In short, by investing in entrepreneurial skills, Higher Education Institutions (HEIs) contribute to the development of society. Considering such investment as a challenge, the entrepreneurial potential of students from the most diverse areas should be stimulated (Lima, Dantas, Teixeira, & Almeida, 2018), and their engagement in academic activities should be promoted (Perkmann, Salandra, Tartari, McKelvey, & Hughes, 2021).

Traditionally, entrepreneurial university education occurs in activities such as courses, seminars, lectures, junior enterprises, and other programs that may be mandatory for students (J.F. Silva & Pena, 2017). Entrepreneurship courses usually start with “talking about it” (content), to then engage students with the presentation of tools and, finally, with managerial and behavioral practices that develop an entrepreneurial mindset through social interactions and meaningful learning. With this, they make students reflect on their independence and autonomy, based on the various possibilities and barriers that they may encounter (Robinson, Neergaard, Tanggaard, & Krueger, 2016) while engaging in their learning process (Bell & Bell, 2020). For Lackéus (2020), entrepreneurship education would also develop general aspects of proactivity, self-knowledge, tolerance to uncertainty, perseverance, and desire to overcome obstacles. Thus, entrepreneurship education would not only have positive impacts on training future entrepreneurs, but would also bring about changes in the individual and in the way he/she deals with academic and work challenges.

In this regard, entrepreneurship studies have focused on understanding how “greater expertise”, “peer collaboration”, “collaborative network development”, and “greater interdisciplinarity” positively affect not only financial outcomes (patents, services, etc.), but also academic quality and productivity (Perkmann et al., 2021). Entrepreneurship would be developing a new way of thinking and communicating, preparing the individual to cope with complex economic and social situations, and developing engagement to overcome them (Tunio, Chaudhry, Shaikh, Jariko, & Brahmī, 2021). For Ndou, Secundo, Schiuma, and Passiante (2018), academic entrepreneurship programs have specific phases, especially for engagement, based on activities that provide the creation of an entrepreneurial mindset. According to Bell and Bell (2020), entrepreneurship education enables the development of new skills, such as creative problem solving and critical thinking, which are also important for the development of learning engagement in individuals. In particular, these effects are greater when there is experiential learning, with authentic situations, and when learning is facilitated by mentors and focused on group work. Thus, it is necessary to consider entrepreneurial potential as a fundamental aspect for understanding the entrepreneurial action itself and the impact on the individual’s life, characterized as a latent factor to be developed that may or may not come to occur.

Having entrepreneurial potential implies showing traits of “professional achievement” (sense of opportunity,

persistence, quality, efficiency, and risks), “planning” (goal identification, information, planning, and control), and “power” (persuasiveness, networking, and self-confidence) (Souza et al., 2017). Moreover, even though people may have previously developed entrepreneurial traits, entrepreneurship courses would help to significantly develop such attitudes and behaviors (Morselli, 2018).

In this study, the Entrepreneurial Potential theoretical model by Souza et al. (2017) is considered. It has 10 dimensions (and attributes): Achievement (recognition of opportunities, persistence, pursuit of quality, efficiency, and risk management); Planning (goal setting, information seeking, continuous planning, and ongoing control); Power (ability to persuade, ability to build a relationship network, and self-confidence); and Entrepreneurial Intention (desire to start or own a business). In the empirical tests, however, some attributes did not show satisfactory values, which led to the use of 10 factors that were characterized as latent observable behaviors.

As mentioned in entrepreneurship studies at HEIs, these factors are in line with the constructs studied in positive psychology, particularly with engagement, since that factor gathers aspects that are related to human well-being and productivity (Schaufeli, 2017).

“Engagement” is characterized as: a behavioral and energetic factor represented by high levels of energy and resilience (vigor dimension); an emotional factor related to a sense of significance and challenge (dedication dimension); and a cognitive factor of high concentration and abstraction in activities (absorption dimension) (Schaufeli, 2017). It is a construct that can be considered a positive cognitive state, persistent over time, motivational and social in nature, not focused on a single goal or situation (J.O.M. Silva, Pereira Junior, Coelho, Picharski, & Zagonel, 2018).

When engagement is analyzed in the academic context, it is found that it implies students’ experiencing sensations and actions that indicate a high degree of involvement in their activities (Medrano, Moretti, & Ortiz, 2015). Moreover, engagement is a predictor of students’ academic performance (Cadime, Lima, Pinto, & Ribeiro, 2016; Meng & Jin, 2017); learning, academic effort, personal development (J.O.M. Silva et al, 2018) and life satisfaction (Meng & Jin, 2017; H.P. Silva, Araújo, Mendes, & Pinho, 2018). It influences aspects such as: motivation (Cadime et al., 2016), effort, goal achievement, persistence, involvement and concentration in studies, and commitment to learning (J.O.M. Silva et al., 2018). Furthermore, engaged students would be more likely to be able to manage effective strategies to overcome adversity (Medrano et al., 2015). In short, developing academic engagement is a desirable factor in educational and work contexts (Perkmann et al., 2021).

As for the “engagement” construct, it can be assessed by the same three dimensions of its theoretical model: vigor, dedication, and absorption. This proposal was validated internationally (Schaufeli & Bakker, 2003) and nationally (Porto-Martins, Machado, & Viacava, 2020) with the possibility of using a single-factor model, considering

engagement as a single construct - the sum of all items in the instrument - as well as a three-factor model, subdividing it into vigor, dedication, and absorption. It is noteworthy that the theoretical perspective, of engagement as a construct, which was used in this study, is the same for both professional and academic engagement, according to the instrument's manual (Porto-Martins et al., 2020).

In short, the conception of entrepreneurship education in Higher Education can be helpful in the dissemination of an entrepreneurial culture and in the development of a new professional profile. It is up to HEIs to contribute to this process, encouraging academics to explore their entrepreneurial potential in the most diverse areas (Almeida, Cordeiro, & Silva, 2018). As highlighted, this would bring not only social and financial impacts for HEIs - by attracting more students, meeting external demands; or even developing companies through incubators, patents, services, etc., - but also academic, attitudinal, and behavioral outcomes with a change in their way of thinking (persistence, overcoming obstacles, planning, etc.), which would result in greater engagement. This is irrespective of whether students will become entrepreneurs or not, because even those who do not become entrepreneurs can benefit from developing technical skills and interpersonal relationships with academic and professional impact (Almeida et al., 2018; Cualheta et al., 2020) by participating in such an environment focused on learning entrepreneurial potential (Morselli, 2018).

Therefore, it is relevant to identify the levels and the relationship between "entrepreneurial potential" and "academic engagement" in students, considering that these are constructs that are associated with socioeconomic development indicators (Cadime et al., 2016) and academic productivity (H.P. Silva et al., 2018). Finally, this study aimed to examine whether entrepreneurship education influences academic engagement and entrepreneurial potential in university students participating and not participating in entrepreneurship education programs. Thus, it is hypothesized that academics involved in entrepreneurship education have higher levels of entrepreneurial potential, which indirectly impacts engagement.

Method

Participants

The total sample ($N = 563$) was convenient (or diversified) and of the intentional random type, being divided into two groups of Higher Education academics. The first group ($N = 72$) - Group of Students Admitted to an Entrepreneurial Program (GSAEP) - consisted of academics selected and enrolled in a program designed for entrepreneurship education at a private HEI in the state of Paraná. The second group ($N = 491$) - Diverse Group (DG) - consisted of students from three private HEIs (one in Rio Grande do Sul, two in Paraná) who did not participate in an entrepreneurial

program by choice or because there was not such a program at the institution. One of these HEIs was the same one with students in GSAEP.

The Entrepreneurial Program at one of the participating HEIs had unique characteristics since it was neither an acceleration nor an incubation process. The institution called it a "germination" process, in analogy to a fertile ground for ideas, on which students have the opportunity to germinate them and turn them into enterprises, to be then forwarded to incubation and/or acceleration processes. In short, it is an open and free program for all university students (undergraduate, certificate, master's, and doctoral students), which takes place every semester during the break periods, with two weekly meetings (each meeting lasting four hours).

Instruments

In order to accomplish the specific objectives in the study, the following were applied: a sociodemographic questionnaire, the Entrepreneurial Potential Identification Scale - *Escala para Identificar Potencial Empreendedor* - EIPE (Souza et al., 2017), and the Utrecht Work Engagement Scale-Students - UWES-S (Schaufeli & Bakker, 2003).

Sociodemographic questionnaire. Characterization of the investigated sample: gender, offspring, academic term, educational background, HEI, program, education level (e.g., undergraduate, master's, doctoral program), kinship with entrepreneurs, whether they were already entrepreneurs, perspective of the economy's future, level of support from the HEI, and confidence to undertake.

Entrepreneurial Potential Identification Scale - (Escala para Identificar Potencial Empreendedor) (Souza et al., 2017). This instrument features 10 dimensions: entrepreneurial intention (INT - 4 items), opportunity (OPO - 5 items), persistence (PER - 6 items), efficiency (EFF - 3 items), information (INF - 5 items), planning (PLA - 4 items), goals (GOA - 7 items), control (CON - 5 items), persuasion (PERSU - 6 items), relationship network (REL - 4 items), and a general scale of entrepreneurial potential (POT - consisting of all dimensions, except for entrepreneurial intention). It is a self-report instrument that uses an 11-point Likert-type scale, from zero (0) "Strongly Disagree (no chance)" to ten (10) "Strongly Agree (absolute certainty)", with 49 items, such as "I feel capable of identifying business opportunities and profiting from them".

Utrecht Work Engagement Scale-Students, version by Porto-Martins and Benevides-Pereira (2008) adapted from Schaufeli and Bakker (2003) for the Brazilian context. It is a three-dimensional instrument, which can be analyzed both in a single-factor (global scale) and in a three-factor form: vigor (VI - 6 items), dedication (DE - 5 items), and absorption (AB - 6 items), and by a global scale (UWES-S - all 17 items). It is a self-report instrument with a 7-point Likert-type scale, from zero (0) "never/not at all" to six (6) "always/every day". An example of an item used refers to: "Regarding my studies, I always persevere (persist) even when things do not work out".

Procedures

Data collection. The data were collected electronically at the beginning of the school term, following consent from people in charge and approval by an ethics and research committee. The participants were advised with regards to the Informed Consent Form (ICF), and the contact information of the researcher in charge was also made available for those who agreed to participate in the study in case they had any questions. Regarding the GSAEP students, they filled out the instruments during the third and fourth week of the program.

Data analysis. Descriptive, reliability, mean-comparison, confirmatory-factor, and regression analyses were performed for mediation testing. The following parameters were used to analyze the structural-equation models of the instruments: $\chi^2/\text{degrees of freedom} < 5.0$; Comparative Fit Index (CFI) > 0.90 ; Adjusted Goodness of Fit Index ($AGFI$) > 0.80 ; Goodness of Fit Index (GFI) $> \text{or} \cong 0.95$; Root Mean Square Error of Approximation ($RMSEA$) < 0.080 ; Root Mean Square Residual (RMR) $\cong 0.05$ and Standardized Regression Coefficient $\beta > 0.40$ (Hair, Black, Babin, & Anderson, 2009).

Ethical Considerations

The data were collected using an electronic protocol, and the research project was approved by the Human Research Ethics Committee of Pontifícia Universidade Católica do Paraná, under CAAE No. 14940819.9.0000.0020.

Results

Sample Characterization

The total sample of $N = 563$ showed: 223 (39.6%) males and 340 (60.4%) females; 87 (15.5%) people reported having children, and 476 (84.5%) did not; the mean age was 24.70 years ($SD = 7.52$). The academics were proportionally distributed over the school terms, with only a small concentration of students in the first terms (1st/2nd - 33.7%; 3rd/4th - 19.2%; 5th/6th - 17.8%; 7th/8th - 16.5%; and 9th/10th - 12.8%). Regarding their educational background, 227 (40.3%) participants reported having attended only public schools, 109 (19.4%) only private schools, and 227 (40.3%) both public and private schools. These results indicated that the students were beginning their professional lives and were, in general, approximately in the middle of their education. Moreover, in relation to the programs attended, different fields were found (namely: humanities, health, and exact sciences), and there were programs, such as Psychology in particular, which accounted for the largest number of students, 114 (20.2%), followed by Business Administration with 98 (17.4%), Physical Education with 76 (13.5%), and Nursing with 58 (10.3%). Of the total number of participants, 532 (94.5%) students were undergraduates, 16 (2.8%) were in certificate programs, and 15 (2.9%) were graduate students. These results showed the diversity of their

educational backgrounds and, to a lesser extent, of their academic levels.

Validation of the Psychometric Quality of the Instruments

The total group sample ($N = 563$) was used to analyze the psychometric characteristics of the instruments, which was considered appropriate for Structural Equation Modeling (SEM), since it exceeded the minimum of five times the number of variables involved (Hair et al., 2009). Following the manual guidelines (Schaufeli & Bakker, 2003), the construction of the UWES model was three-factor, non-recursive and first order, with three factors (or dimensions) and their respective 17 items. The EIPE model followed the non-recursive (Souza et al., 2017), first-order structure, consisting of 10 factors (or dimensions), initially with 49 items. It was necessary to adjust the EIPE instrument by removing five items (ep34 - GOA; ep35 - CON; ep8 - OPO; ep10 - PERSU; and ep19 - INF) due to their low standardized coefficient, in order to constitute such dimensions and high covariance (Hair et al., 2009). Thus, the $\chi^2/\text{degrees of freedom}$ indexes and CFI showed values that met the established criteria. The GFI , $AGFI$, $RMSEA$ and RMR indexes were close to the statistical parameters. Furthermore, this investigation provided data that agreed with the EIPE validation study by Souza et al. (2017): χ^2/gf (2.32 versus 1.45); CFI (0.94; 0.99); GFI (0.86; 0.98); $AGFI$ (0.84; 0.97); $RMSEA$ (0.05; 0.03) and RMR (0.04; 0.07), as well as with UWES-S, as regards the validation by J.O.M. Silva et al. (2018): X^2/gf (4.442; 8.10; not shown); CFI (0.94; 0.83; 0.95); GFI (0.90; 0.80; 0.95); $AGFI$ (0.86; 0.74; not shown); $RMSEA$ (0.09; 0.08; 0.07) and RMR (0.04; not shown).

In both the EIPE and UWES-S instruments, all standardized regression coefficients exceeded the established standard (> 0.40), suggesting high consistency of the models, as well as an intense relation between the items and their respective dimensions. When analyzing EIPE, the most intense value was $\beta = 0.90$ (item-31/GOA and item-2/INT), and the smallest was $\beta = 0.64$ (item-5/OPO). In addition, all dimensions of the instruments showed satisfactory Cronbach's Alpha values ($\alpha > 0.7$) Hair et al. (2009); (EIPE_{int} = 0.914 / EIPE_{opo} = 0.811 / EIPE_{per} = 0.897 / EIPE_{eff} = 0.846 / EIPE_{inf} = 0.892 / EIPE_{pla} = 0.852 / EIPE_{goa} = 0.927 / EIPE_{rel} = 0.891 / EIPE_{con} = 0.913 / EIPE_{per} = 0.926 / EIPE_{general} = 0.901) and in line with Souza et al. (2017), with $N = 455$ college students.

As for the UWES-S dimensions, satisfactory indexes were also found (UWES_{vigor} = 0.851 / UWES_{dedication} = 0.855 / UWES_{absorption} = 0.867 / UWES_{general} = 0.923), but it is noteworthy that no publications were identified with the Brazilian version for that index. However, the data are consistent with those from international sample studies, according to that by Schaufeli and Bakker (2003), with $N = 527$ Dutch students; that by Meng and Jin (2017), with $N = 480$ Chinese Nursing students, and that by (Cadime et al., 2016), with $N = 229$ Portuguese academics, since those studies showed α indexes $> .70$.

In summary, when analyzing the results systemically, considering the statistical patterns and the convergence with other studies, it was concluded that both models (EIPE and UWES-S) could be considered adequate for the present study.

Hypothesis testing

In order to test the hypothesis - that the academics involved in entrepreneurship education show higher levels of entrepreneurial potential, and that it indirectly influences engagement - the EIPE and UWES-S means were firstly compared using the Mann-Whitney U-test, as described in Table 1. It was observed that the GSAEP group showed higher mean EIPE values than those of DG (EIPE_{GSAEP} = 8.51 SD = 0.89, EIPE_{DG} = 7.26 SD = 1.45),

as well as in all items, thus corroborating the initial part of the hypothesis. As a highlight, the largest differences for entrepreneurial intention (INT/EIPE_{GSAEP} = 8.07 SD = 1.64, INT/EIPE_{DG} = 6.00 SD = 2.75 $p < 0.001$), opportunity (OPO/EIPE_{GSAEP} = 8.60 SD = 1.12, INT/EIPE_{DG} = 7.15 SD = 1.79 $p < 0.001$) and control (CON/EIPE_{GSAEP} = 8.18 SD = 1.64, CON/EIPE_{DG} = 6.51 SD = 2.42 $p < 0.001$) could be noted, but overall there was a significant mean difference in 14 of the 15 cases, considering $p < 0.01$. There was also a significant difference for UWES-S (UWES-S_{GSAEP} = 4.56 SD = 0.87, UWES-S_{DG} = 4.404 SD = 1.09) and the others. The exception was in the DE/UWES-S dimension (DE/UWES_{GSAEP} = 4.94 SD = 0.89/ DE/UWES_{DG} = 4.66 SD = 1.11), which showed $p = 0.071$, denoting only marginally significant differences between the groups.

Table 1
Comparison of EIPE and UWES-S means between the GSAEP and DG groups

Scale	Sample	N	Mean	SD	Mann-Whitney's U-Test	p
INT	GSAEP	72	8.07	1.64	9778.00	.001
	DG	491	5.99	2.75		
OPO	GSAEP	72	8.60	1.12	8810.5	.001
	DG	491	7.15	1.79		
PER	GSAEP	72	8.77	1.18	11681.0	.001
	DG	491	7.76	1.76		
EFF	GSAEP	72	9.12	1.13	13865.0	.001
	DG	491	8.38	1.77		
INF	GSAEP	72	9.40	0.66	12005.0	.001
	DG	491	8.43	1.57		
PLA	GSAEP	72	7.83	1.56	10570.5	.001
	DG	491	6.71	2.09		
GOA	GSAEP	72	8.14	1.58	10208.5	.001
	DG	491	7.07	2.07		
CON	GSAEP	72	8.18	1.64	11259.5	.001
	DG	491	6.51	2.42		
PERSU	GSAEP	72	8.24	1.36	11259.5	.001
	DG	491	7.08	1.95		
REL	GSAEP	72	8.74	1.27	10570.5	.001
	DG	491	7.47	1.99		
EINPE	GSAEP	72	8.51	0.89	8383.5	.001
	DG	491	7.26	1.45		
VI	GSAEP	72	4.43	0.96	11523.0	.001
	DG	491	3.78	1.15		
DE	GSAEP	72	4.94	0.89	15352.0	.071
	DG	491	4.66	1.11		
AB	GSAEP	72	4.32	1.03	12092.5	.001
	DG	491	3.67	1.23		
UWES-S	GSAEP	72	4.56	0.87	12437.5	.001
	DG	491	4.04	1.09		

Note. INT = entrepreneurial intention; OPO = opportunity; PER = persistence, EFF = efficiency; GOA = goals; INF = information; PLA = planning; CON = control, PERSU = persuasion, REL = relationship network; EINPE = entrepreneurial potential; VI = vigor; DE = dedication; AB = absorption; UWES-S = academic engagement; GSAEP = Entrepreneurship Program Group; DG = diverse group.

It is also noteworthy that GSAEP also showed higher values in 14 of the 15 items (only the p value of EIPE_{inf} = 0.119) in relation to the DG students from the

same HEI (students from the same HEI who did not have such training $N = 49$), according to the Mann-Whitney U-tests (Table 2).

Table 2

Comparison of EIPE and UWES-S means between the GSAEP and DG from the same HEI

Scale	Sample	N	Mean	SD	Mann-Whitney's U-Test	p
INT	GSAEP	72	8.07	1.64	911.0	.001
	DG same HEI	49	6.06	2.51		
OPO	GSAEP	72	8.60	1.12	736.0	.001
	DG same HEI	49	6.79	2.02		
PER	GSAEP	72	8.77	1.18	889.5	.001
	DG same HEI	49	7.24	1.99		
EFF	GSAEP	72	9.12	1.13	1178.5	.001
	DG same HEI	49	8.41	1.93		
INF	GSAEP	72	9.40	0.66	1475.5	.119
	DG same HEI	49	8.45	1.93		
PLA	GSAEP	72	7.83	1.56	1092.0	.001
	DG same HEI	49	6.41	2.30		
GOA	GSAEP	72	8.14	1.58	916.0	.001
	DG same HEI	49	6.54	2.18		
CON	GSAEP	72	8.18	1.64	1186.5	.002
	DG same HEI	49	6.93	2.41		
PERSU	GSAEP	72	8.24	1.36	1042.0	.001
	DG same HEI	49	6.83	2.21		
REL	GSAEP	72	8.74	1.27	947.0	.001
	DG same HEI	49	7.37	2.04		
EINPE	GSAEP	72	8.51	0.89	773.5	.001
	DG same HEI	49	7.10	1.75		
VI	GSAEP	72	4.43	0.96	1077.0	.001
	DG same HEI	49	3.63	1.26		
DE	GSAEP	72	4.94	0.89	1242.0	.006
	DG same HEI	49	4.32	1.11		
AB	GSAEP	72	4.32	1.03	1186.0	.002
	DG same HEI	49	3.56	1.03		
UWES-S	GSAEP	72	4.56	0.87	1106.0	.001
	DG same HEI	49	3.84	1.22		

Note. INT = entrepreneurial intention; OPO = opportunity; PER = persistence, EFF = efficiency; GOA = goals; INF = information; PLA = planning; CON = control, PERSU = persuasion, REL = relationship network; EINPE = entrepreneurial potential; VI = vigor; DE = dedication; AB = absorption; UWES-S = academic engagement; GSAEP = Entrepreneurship Program Group; DG same HEI = diverse group, but only students from the same HEI.

Also, a Kruskal-Wallis test between HEIs in DG, that is, students from the other HEIs who did not take the entrepreneurship training course, also showed no significant differences for EIPE ($p = 0.141$) or UWES-S ($p = 0.319$), indicating that it was not an effect from one HEI in relation to the others (DG), but from the group of students who participated in the entrepreneurial training program (GSAEP).

Then, the direct and indirect effects from the EIPE (mediator) groups (codes GSAEP = 1 DG = 0) on UWES-S (dependent) were examined while controlling for external effects to the model (covariates: gender, term, age, number of children, and whether they had an entrepreneurial relative), which, in individual analyses, showed significant relationships with the variables. Model 4 (Bootstrap Samples 10,000) in the *Process* 3.5.3 module for SPSS (Hayes, 2018) was used. In the first part of the analysis, the mediating variable EIPE ($F(6,556) = 9.4365$ $p < 0.001$ $R^2 = 0.0924$) was found to be significantly affected only by the group variable (GSAEP vs DG), suggesting that participation in the Entrepreneurial Program had a positive effect (Coef +1.2097 $p < 0.001$ LLCI = 0.8611 ULCI = 1.5583 / $EIPE_{GSAEP} = 8.51$ $SD = 0.89$ $EIPE_{DG} = 7.26$ $SD = 1.45$), and that a marginal effect existed if the student

had any entrepreneurial relatives (Coef +0.2174 $p = 0.0634$ LLCI = -0.0122 ULCI = 0.4469 / $EIPE_{witharerelative} = 7.61$ $SD = 1.40$ $EIPE_{withoutarerelative} = 7.27$ $SD = 1.55$) (others: gender $p = 0.1931$; term $p = 0.8325$; age $p = 0.3180$; number of children $p = 0.1596$). In other words, if the student participated in an entrepreneurship training program and/or if he/she already had an entrepreneurial relative in the family, he/she would tend to have a higher mean EIPE score.

Next, it was observed that the dependent variable UWES-S ($F(7,555) = 36.3670$ $p < 0.001$ $R^2 = 0.3145$) was significantly affected by the EIPE mean (Coef +0.3327 $p < 0.001$ LLCI = 0.2785 ULCI = 0.3868), marginally by GSAEP in relation to DG (Coef +0.2107 $p = 0.0799$ LLCI = -0.0252 ULCI = 0.4465), and not significantly if the student had an entrepreneurial relative (Coef -0.0045 $p = 0.9528$ LLCI = -0.1542 ULCI = 0.1452). Analyses of indirect effects (GSAEP>EIPE>UWES: Coef = 0.4024 LLCI = 0.3011 ULCI 0.5120 / $Z = 5.9198$ $p < 0.001$) indicated full mediation. Thus, although students with entrepreneurial backgrounds showed greater engagement ($UWES_{GSAEP} = 4.56$ $SD = 0.87$ $UWES_{DG} = 4.04$ $SD = 1.09$), it depended on greater entrepreneurial potential (EIPE), thus corroborating the hypothesis.

In addition, it was identified that the other covariates had significant relationships with UWES-S. Firstly, the larger the number of children (Coef +0.2630 $p = 0.005$ LLCI = 0.1150 ULCI = 0.4111) and the older the age (Coef +0.0190 $p = 0.0089$ LLCI = 0.0048 ULCI = 0.0333), the greater the students' engagement. On the other hand, the most advanced the students' terms, the lower their engagement (Coef -0.0622 $p < 0.0001$ LLCI = -0.0904 ULCI = -0.0341). It was also found that female students had greater engagement (male = 0 / female = 1; Coef +0.1847 $p = 0.0343$ LLCI = 0.0137 ULCI = 0.3558 / UWES_{male} = 3.97 $SD = 1.14$ UWES_{female} = 4.19 $SD = 1.01$). Thus, these results provide evidence that academic engagement associates positively with entrepreneurial potential. Furthermore, Pearson's correlations of the EIPE and UWES-S dimensions also corroborated such results: *SupportHEI* ↔ *Confident* ($r = 0.114$; $p = 0.032$); *SupportHEI* ↔ *POT* ($r = 0.186$; $p = 0.000$); *SupportHEI* ↔ *UWES-S* ($r = 0.222$; $p = 0.000$); *Confident* ↔ *POT* ($r = 0.167$; $p = 0.000$); *Confident* ↔ *Uwes-S* ($r = 0.078$; $p = 0.113$) and *POT* ↔ *UWES-S* ($r = 0.474$; $p = 0.000$).

Discussion

Based on these results, it is assumed that by working on the aspects related to students' entrepreneurship training, HEIs can develop greater entrepreneurial potential in them and produce a positive engagement contagion in their academic community. This is a desirable aspect, since an individual with high entrepreneurial potential tends to take advantage of work opportunities for his/her personal or for collective benefit, thus developing engagement to be more productive and happier in the activities performed (Medrano et al., 2015), with higher quality and academic productivity (Perkmann et al., 2021).

However, it is to be noted that it is not possible to state that participation in the program exclusively determined the difference, but it confirmed the theoretical assumption in the study. This is because, some students could potentially exhibit prior entrepreneurial traits (Souza et al., 2017). However, previous findings (such as those here) indicate that courses and/or activities that develop entrepreneurial potential help in significantly enhancing such attitudes and behaviors (Morselli, 2018). In summary, the data denote the importance of stimulating and further studying these factors, since, in the present sample, they interfered with important processes for HEIs. On the other hand, since entrepreneurial potential can influence engagement, there would also be the possibility of developing such potential in an interdisciplinary fashion as well, not only in courses and/or after-school activities or even through the mentoring process (Bell & Bell, 2020; Perkmann et al., 2021). Furthermore, regardless of the field of activity, these competencies and skills can help to deal with challenges and uncertainties (Cualheta et al., 2020).

These results corroborate the theoretical assumption that HEIs can be important agents for developing the entrepreneurial potential of individuals (Almeida et al., 2018),

in promoting and developing entrepreneurial actions (Bell & Bell, 2020; Lackéus, 2020) as well as in promoting factors of academic engagement (Medrano et al., 2015). Therefore, it is important to invest in institutional actions for the development of such aspects, considering that they are associated with better rates as regards health conditions, well-being, and academic performance, generating positive outcomes for students, teachers, HEIs, and the society. Furthermore, the identification of these and other aspects can be fundamental to encourage institutional actions aimed at students' productivity, well-being, and better academic and work opportunities, regardless of whether or not they will become entrepreneurs. This is because even students who will not become entrepreneurs can benefit from the development of technical and interpersonal competencies (Almeida et al., 2018; Cualheta et al., 2020) and from the commitment to the activities that they perform (Medrano et al., 2015).

The results also suggest an impact of training in the GSAEP group, which showed higher EIPE means in all dimensions - compared to the means of 654 university students in the study by Souza et al. (2017) (with distinct samples of university students). On the other hand, DG had lower mean scores, when compared to those in the validation study. Regarding UWES-S, the groups in this study obtained slightly lower means for Vigor and Absorption, and lower means for Dedication when compared to those in the study by J.O.M. Silva et al. (2018).

Also regarding the comparisons between groups (GSAEP and DG), significant mean differences were found for other variables. The students who took the entrepreneurship training program perceived greater HEI support ($M_{GSAEP} = 4.60$ $SD = 0.63$; $M_{DG} = 3.86$ $SD = 0.87$ $p < 0.001$), felt more confident ($M_{GSAEP} = 3.43$ $SD = 0.65$; $M_{DG} = 2.91$ $SD = 0.810$ $p < 0.001$) and prepared to undertake ($M_{GSAEP} = 3.08$ $SD = 0.80$; $M_{DG} = 2.15$ $SD = 0.89$ $p < 0.001$), in addition to showing greater willingness to undertake ($M_{GSAEP} = 4.67$ $SD = 0.68$; $M_{DG} = 3.82$ $SD = 1.07$ $p < 0.001$). These data corroborate the assumption of the importance of creating actions that foster entrepreneurial education (Press, McLean, & McCauley, 2020).

When comparing the groups of academics who participated in entrepreneurship education programs with academics from other HEIs that did not have programs designed for this purpose, it was found that the former achieved significantly higher rates both for entrepreneurial potential and academic engagement. The same pattern was observed when the sociodemographic variables "HEI support" and "confidence to undertake" were analyzed. Based on these findings, it is considered that the objective proposed in this study was achieved.

As regards the limitations to this study, it is necessary to point out that the reasons for the differences or causality of the indicators for entrepreneurial potential, academic engagement, and sociodemographics between the groups were not identified. Also, no longitudinal collections were performed regarding the students, especially those who passed the entrepreneurial education program.

Also, the inferred and reiterated influence could be a result of personal characteristics of individuals at each institution. In addition, each institution may have different approaches to entrepreneurship education. However, since there were differences within the same institution - which had groups with and without entrepreneurship training - and no significant differences between the groups from different HEIs that did not have it, this should not have significantly affected the results. But, since the individuals in the group with entrepreneurship training were not randomly selected, it is impossible to rule out such an assumption.

Another limiting factor was the difficulty to find other similar studies in relation to the instruments and the participants' characteristics, which restricted the discussion and comparison with other studies. Nevertheless, as regards the entrepreneurial-potential (EIPe) and academic-engagement (UWES-S) instruments, both had adequate psychometric qualities for the measurement proposed in this study, as they also showed a positive and significant correlation, thus indicating an apparent mutual propulsion, which is desirable in the HEI context.

Further studies are suggested, specifically with participants in the entrepreneurship education program, in order to better understand the results and the causal relationships between the variables analyzed. Additionally, investigations into concrete actions that can develop entrepreneurial potential and stimulate academic engagement are also recommended.

Finally, we emphasize that the study of the profile of students who participate in entrepreneurship education programs is still incipient, especially when associated with engagement. Thus, there is a demand for future studies that can contribute towards engaged and entrepreneurial university education. Therefore, investment in programs focused on students' entrepreneurship education is promising and indicates the possibility of training, still in the HEI context, professionals who can be engaged in academic activities in general, generate new ventures, as well as contribute to socioeconomic development.

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