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Entrepreneurial intention acknowledgment in sustainable entrepreneurship: An exploratory study

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Abstract

Entrepreneurship is more than ever a key factor to successfully survive and build a sustainable future, as it is linked to certain positive and proactive personality traits and innovation and creativity. Higher education assumes a pivotal role in this ongoing process, as students of today need to be guided into becoming tomorrow's leaders. The 21st century demands new skills and education. The effectiveness of entrepreneurship can be improved the better the students' intentions are understood. This research involves 101 respondents from a population of 300 students. Taking as dimensions attitude, norms, and behaviour, hierarchical and k-means clustering methods were applied to the responses, yielding five entrepreneurial intention profiles (clusters). This is the main contribution of this study to the literature, which may help entrepreneurship program administrators and students alike to improve their entrepreneurial skillset. This study also presents a new approach to better motivate and work with students on what concerns entrepreneurship.

Keywords: Entrepreneurship, Entrepreneurial intention profile, Higher Education.

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1 Introduction

Entrepreneurship is a key element to competing in a global knowledge market (Kabir, 2019; Penco et al., 2020; Qian, 2018; Ratten et al., 2016), as well as innovation (Schumpeter, 2000) and creativity (Belitski & Desai, 2016). The world is changing, and a paradigm shift is needed (Dieguez, 2018) to surpass with success all the ongoing challenges (European University Foundation, 2022; European Commission, 2017).

Higher education plays an important role in this energising ongoing process (Cincera et al., 2018) developing competencies that go beyond disciplinary knowledge include skills, and attitudes geared toward a holistic and sustainability-driven approach (Rae, 2010; Wamsler, 2020). Literature shows that students perform better when involved in their learning process and activities, while critically thinking about them and are being prepared for future professional situations (Taylor Jr, 2022; Dieguez et al., 2019). And this is a significant difference from passive learning (Pelley, 2014) which demands new approaches to better motivate and work with students in what concerns entrepreneurship.

This paper focuses on the identification of entrepreneurial intention profiles of students at the Polytechnic Institute of Cávado and Ave (IPCA) and Polytechnic Institute of Porto (IPP), both based in the north of Portugal. The content is organized into four main sections. Initially, a literature review is presented, followed by a concise overview of the research methodology. The descriptive data is provided, and subsequently, the survey results are analysed using hierarchical and k-means clustering techniques to identify different student profiles in relation to their entrepreneurial intentions in terms of attitude, norms, and behaviour. The findings are then discussed and evaluated, along with the limitations of the study. Lastly, recommendations for future research are suggested, and the conclusions are presented.

2 Literature Review

2.1 Paradigm shifting in Higher Education

Entrepreneurship is a complex concept (Donaldson, 2021), and has no single definition (Pradhan et al., 2020), and has been evolving (Hisrich et al., 2017). No longer is entrepreneurship only linked with one´s job creation and survival (Marvel et al., 2016). An association is established with more educated people, often with already stabilized successful professional careers (Figueiredo & Paiva, 2019). From a narrower perspective, entrepreneurship is related to identifying opportunities, business development, self-employment, creation, and the growth of ventures and companies (Fayolle & Gailly, 2008). From a broader perspective, entrepreneurship encompasses personal growth, initiative, creativity, action orientation, and self-confidence (Robinson et al., 2016). Consequently, the definition and approach used in teaching entrepreneurship have far-reaching effects on various aspects, such as the education objectives, the intended audience, the curriculum, the teaching techniques, and the evaluation processes (Mwasalwiba, 2010).

In this complex context, Higher Education Institution assumes a pivotal role in stimulating entrepreneurship (Schubert & Kroll, 2016), creating, and promoting regional economic growth and competitiveness (Audretsch, et al., 2012). Being pointed out as one of the key elements of Entrepreneurship Ecosystems (Spigel, 2016; de Araujo Ruiz & Martens, 2019), they are not only linked with teaching and research but also with problems and market demand solving (Etzkowitz, 2004). Higher Education Institutions interact with other actors, namely civil society while promoting causes of common interest, and environmental preservation, among others (Carayannis & Rakhmatullin, 2014; Ap da Costa Mineiro et al., 2018). They must be vibrant ecosystems of entrepreneurship (De Jaeger, et al, 2017), branded by the scope and complexity of offering initiatives in the academic entrepreneurship, company support, and entrepreneurial behaviour dimensions (Peppler, 2013). A link between entrepreneurship education and the entrepreneurial ecosystem can be established (Wraae & Thomsen, 2019).

Ghafar (2020) notes that students are the central beneficiaries of the entrepreneurship education system and serve as the foundation for human capital development, equipped with the necessary skills for the modern era. The world is changing, and a paradigm shift is a priority. New changing mindset and methodologies must be developed for students and teachers to reduce the stigma of failure and increase the capacity for informed decision-making (Dieguez et al., 2021; Dweck & Yeager, 2021; Yeager et al., 2022). As per the OECD (2016), students represent the leaders of tomorrow and hold a crucial position in supporting organizations to surpass their competitors in terms of both sustainability and competitiveness.

2.2 Entrepreneurial Intention

The intention seems to be an immediate antecedent of performing a behaviour (Ajzen & Fishbein, 1977) and reports to an integrated sum of personal factors, among which are interest, experience, and actions, to achieve goals, projects, or desired outcomes (Sheeran & Webb, 2016). Intentions have a positive correlation with behaviour to occur (Ajzen & Fishbein, 1977) and have been evidenced to be the best predictors of individual conduct when the behaviour is rare, hard to observe, or contains random time delays (Krueger & Brazeal, 1994).

Entrepreneurial intentions are affected by both individual domains, such as motivation, personality, and prior experience, and contextual factors, including social context and economic factors (Bird, 1988). As stated by Zhao et al. (2005), psychological traits and acquired skills and competencies are among the factors that shape entrepreneurial intentions. Additionally, environmental influences and support can also have an impact on such intentions (Zhao et al., 2005). The creation of a possible own business can be predicted through the analysis of the owner's entrepreneurial intention (Lavelle, 2021; Shirokova et al., 2016), although, as Davidsson (1995), advises, the intention does not mean achievement. Entrepreneurial intentions can forecast, while poorly, the individual's option to create a business (Davidsson, 1995), as noted by Wilson and Martin (2015), entrepreneurial intentions do not always lead to entrepreneurial action and represents a desire at a certain moment.

The literature review is generous within research on this topic, namely focusing on individuals' personality traits and personal characteristics (Matz & Harari, 2021; Rauthmann et al., 2015), behavioural and external factors (Doanh, 2021; Marques et al., 2012). It also additionally includes intention models (Gartner, 1985; Eid et al., 2019), where a mix of variables are connected, namely attitudes, family background, education, gender, and entrepreneurial role models, among others (Anwar & Abdullah, 2021; Liñán & Fayolle, 2015; Nowiński, & Haddoud, 2019).

The Theory of Planned Behaviour (Ajzen, 1985, 1991) is the most well-known theoretical framework on this topic, claiming the power of intention as the closest force to drive action (figure 1). Sometimes, entrepreneurial intentions can trigger entrepreneurial behaviours (Kautonen et al., 2015) and researchers present a lot of evidence about the relevance of the Theory of Planned Behaviour (Schlaegel & Koenig, 2014; Tommasetti et al., 2018).

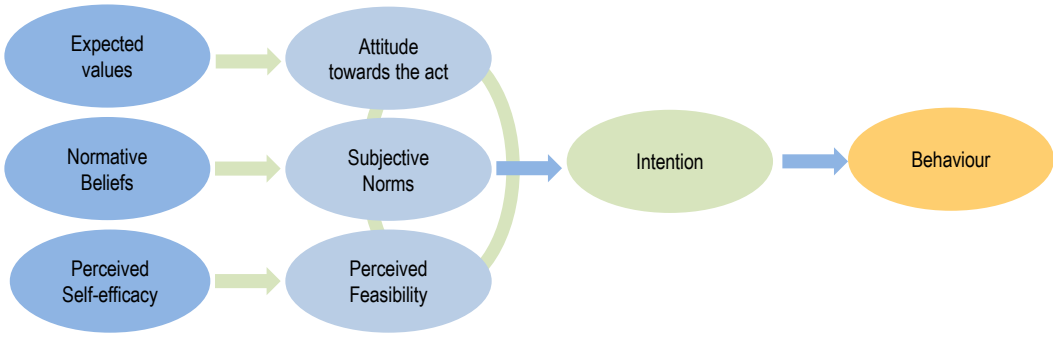

Figure 1. Ajzen's Theory of Planned Behaviour (own elaboration)

This Theory got visibility when Shapero presented the Entrepreneurial Event Model (EEM), adding more influencers to behaviour, namely desirability, perceived feasibility, and propensity (Shapero & Sokol, 1982) (figure 2). An individual may prospect attractiveness in starting a business. However, he/she may or may not believe that it is the right moment to start a business (Shapero & Sokol, 1982). An individual's disposition on acting upon their decisions is called the propensity to act (Shapero, 1984).

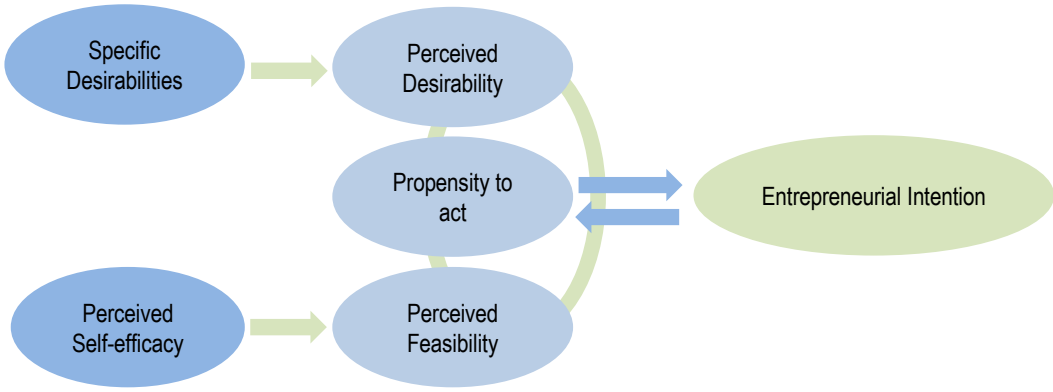

Figure 2. Shapero and Sokol's Entrepreneurial Event Model (own elaboration)

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In this model as with Ajzen's model, extrinsic impacts do not directly affect intentions or behaviour. They influence the perceptions of desirability and feasibility of the personal situation. In this sense, more than half of the intentions for entrepreneurship variation depend on the desirability, perceived feasibility, and propensity to act (Krueger et al., 2000). Perceptions of feasibility seem to explain variation best (Krueger, 1993).

Nevertheless, it was only in 1993, with Krueger and Carsud, that these approaches met and began to be applied to Entrepreneurial intentions studies (figure 3). This research area has been arousing great interest and, accordingly to Dolhey (2019), from 2000 to 2018, a total of 1,393 academic papers have been published about it.

Although Ajzen's theory started to be applied in other areas, namely entrepreneurship and Krueger and Carsud (1993) the researchers responsible for making TPB the theory of reference in the research of entrepreneurial intention (Lages et al., 2020), argue that models of intentions are better to understand the antecedents of a business, as they can identify outputs and reasons, as well as reveal meaningful insights (fig. 3).

As can be seen in the model presented above, entrepreneurial behaviour can be explained through intentions that are influenced by the perceived attractiveness of entrepreneurial behaviour, perceived social norms about entrepreneurial behaviour, and perceived self-efficacy. According to Liñan and Fayolle (2015), from then on, research on entrepreneurial intention has expanded across the whole world. The new studies addressed among other nuances tests of the theory, the use of new variables, new methodologies, and different intentions. In the empirical field, questionnaires and measurement scales have been elaborated by several authors, such as Liñan and Chen (2009), with the questionnaire on the entrepreneurial attitude and intention of university students, which can be applied in countries with different cultures.

However, some confusion remains since, although the theoretical model points to intention as the trigger of action (Liñán & Fayolle, 2015), an intention is not always realized (Liu et al., 2011; Oliveira & Rua, 2018), due to many reasons, among which the conditioning factors that can be controlled by the individual or that are extraneous, but that completely change the initial situation in which he/she was when he/she had the intention to undertake (Gollwitzer & Sheeran, 2006).

The following figure (figure 4) succinctly describes the logic behind entrepreneurial behaviour, from the moment it starts with intention, to entrepreneurial intention and entrepreneurial behavior.

One way of approaching entrepreneurial intention is through the Theory of Planned Behaviour (TPB) (Ajzen, 1987, 1991), a theory that encompasses three main components, namely perceived feasibility, subjective norms, and attitude towards the act. The stronger these components are,

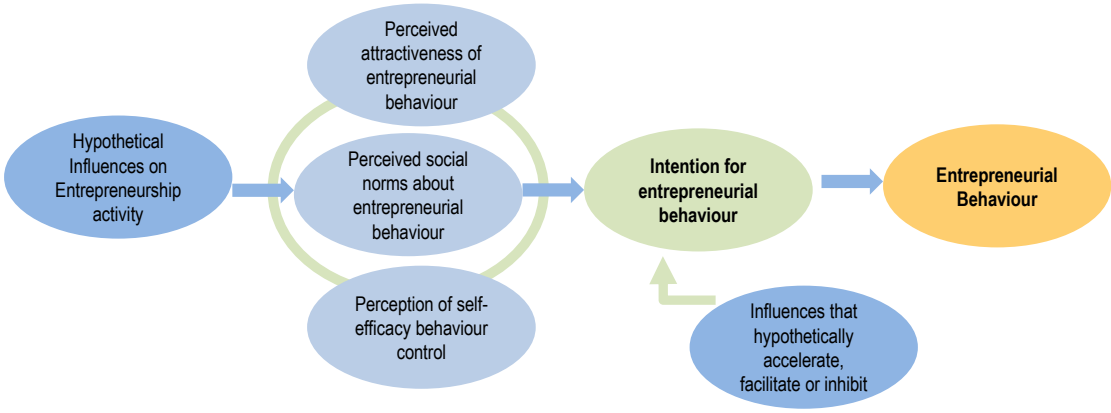

Figure 3. Krueger and Carsud Model (1993) (own elaboration)

the greater the intention and the more likely the individual is to proceed to action (Azjen, 1991). One way of approaching entrepreneurial intention is through the Theory of Planned Behaviour (TPB) (Ajzen, 1987, 1991), a theory that encompasses three main components, namely perceived feasibility, subjective norms, and attitude towards the act. The stronger these components are, the greater the intention and the more likely the individual is to proceed to action (Azjen, 1991).

The TPB is based on the theory of rational action (Fishbein et al., 1980), providing a conceptual framework for studying and predicting intention, considering it as a function of expected values, normative beliefs, and perceived self-efficacy to achieve a behaviour (Fishbein et al., 1980). All these components are important and there is no consensus about the strongest one (Siu & Lo, 2013), as its weight change accordingly to the context. Nevertheless, some researchers believe that attitude is the most predictive of them (Fishbein et al., 1980). The TPB is based on the theory of rational action (Fishbein et al., 1980), providing a conceptual framework for studying and predicting intention, considering it as a function of expected values, normative beliefs, and perceived self-efficacy to achieve a behaviour (Fishbein et al., 1980). All these components are important and there is no consensus about the strongest one (Siu & Lo, 2013), as its weight change accordingly to the context. Nevertheless, some researchers believe that attitude is the most predictive of them (Fishbein et al., 1980).

Another way of addressing entrepreneurial intention is through the Entrepreneurial Event Model (EEM), a model developed by Shapero and Sokol, in 1982, and more explicitly oriented to determine entrepreneurial intention, even if also can predict entrepreneurial intention (Krueger, Reilly & Carsrud, 2000). It includes three determinants, namely: perceived feasibility, propensity to act, and perceived desirability. An individual can be attracted to open a business but may perceive the moment as not being the right time to do so (Shapero & Sokol, 1982). In this sense, extraneous influences do not directly affect intentions or behaviour in EEM and TPB, but undoubtedly influence the persons situation perceptions of feasibility and desirability. Perceptions of feasibility seem to explicate difference best (Krueger, 1993). According to Lages et al. (2020), as previously mentioned, models of intentions can identify outputs and reasons, as well as reveal meaningful insights. An individual can be attracted to open a business but may perceive the moment as not being the right time to do so (Shapero & Sokol, 1982). In this sense, extraneous influences do not directly affect intentions or behaviour in EEM and TPB, but undoubtedly influence the persons situation perceptions of feasibility and desirability. Perceptions of feasibility seem to explicate difference best (Krueger, 1993). According to Lages, Rodrigues & Sousa Filho

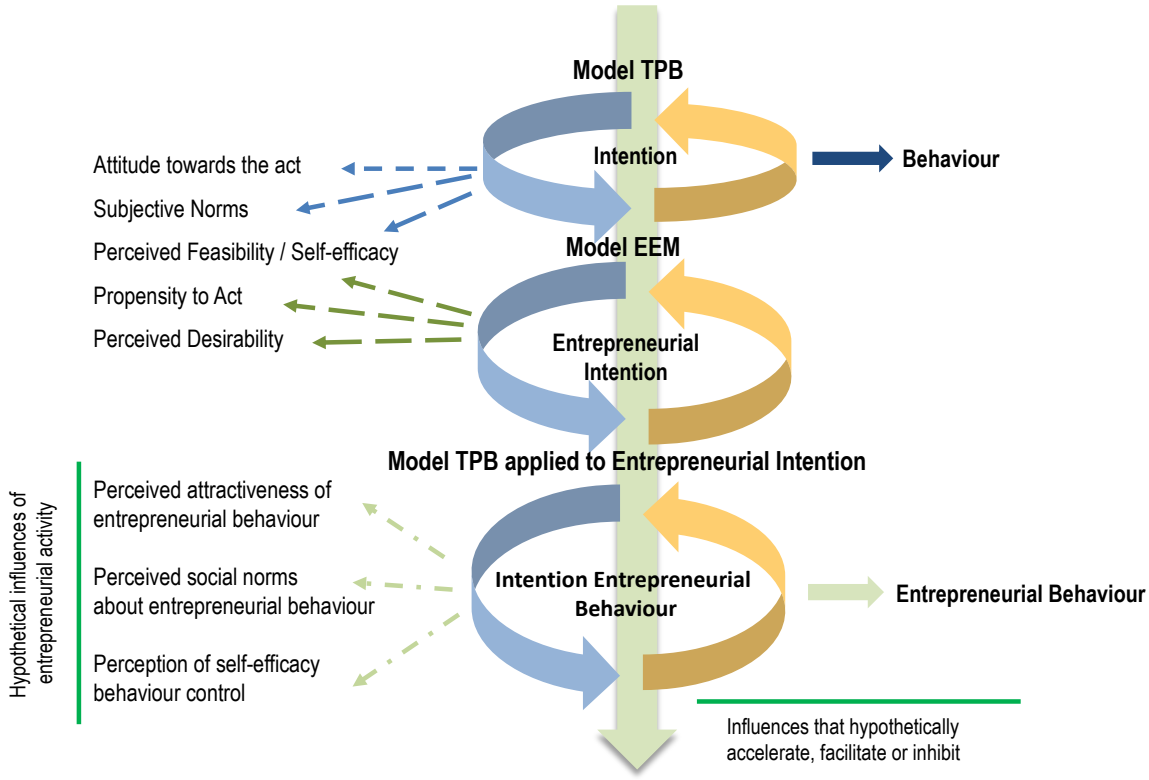

Figure 4. From Intention / to Intention Entrepreneurial Behaviour (own elaboration)

(2020), as previously mentioned, models of intentions can identify outputs and reasons, as well as reveal meaningful insights.

As can be seen in the model presented in entrepreneurial behaviour can be explained through intentions that are influenced by the perceived attractiveness of entrepreneurial behaviour, perceived social norms about entrepreneurial behaviour, and perceived self-efficacy. According to Liñan and Fayolle (2015), from then on, research on entrepreneurial intention has expanded across the whole world. The new studies addressed among other nuances tests of the theory, the use of new variables, new methodologies, and different intentions. In the empirical field, questionnaires and measurement scales have been elaborated by several authors, such as Liñan and Chen (2009), with the questionnaire on the entrepreneurial attitude and intention of university students, which can be applied in countries with different culture

3 Methodology

The selected methods were developed bearing in mind the main objectives of this study: to try to identify students' profiles in what concerns entrepreneurial intention in sustainable entrepreneurship, considering their attitude, norms, and behaviours. Guided by the constructivist research paradigm, this is quantitative research, of descriptive and inductive nature, which builds upon a questionnaire for data collection (Grégoire et al, 2015) to form clusters of students with similar entrepreneurial intention profiles, through the combined use of an agglomerative hierarchical clustering method, and k-means clustering algorithms (Hartigan & Wong. 1979).

The underlying assumption is that entrepreneurs undertake actions aimed at realizing their vision for the future, while pursuing opportunities that align with their beliefs and aspirations (Karp, 2006). This is influenced by their emotions and perceptions of the situations they have

encountered, and their subjective choices concerning entrepreneurial value creation. Their ability to assess the potential impact of such decisions also plays a crucial role, as highlighted by Alvarez et al. (2010), Grégoire et al. (2015), and Karp (2006).

The population comprises the tourism bachelor's and master's students of IPCA and IPP. The instrument for data collection was designed by adapting scales validated in the empirical and conceptual literature: entrepreneurial intention, attitude towards behaviour, subjective norms, and behavioural control questionnaires by Autio et al. (2001), perceived feasibility and perceived desirability questionnaires by Krueger (1993) and propensity to act questionnaire by Lee and Tsang (2001). It also was adapted from the study presented in July at ICIEMC 2021 by Dieguez (2021). The final version of the data collection instrument contains 2 major groups, namely: i) sociodemographic data and ii) entrepreneurial intention. The questions (34) were all closed-ended.

From a total of 300 students, 101 responses were collected, corresponding to a response rate of 33.67%. The questionnaire was distributed through Google Forms in May 2021. The questionnaire (see Appendix A) was previously validated by two academic experts in entrepreneurship, and three students (one from IPCA and two from IPP), having not suffered changes to the original version proposed. Finally, each cluster, i.e., entrepreneurial intention profile, received a designation after analysing the mean values obtained in each question, for each cluster's centroid.

4 Empirical components

The participants' responses were treated using descriptive statistics, based on the frequencies of responses, with the aim of profiling and discussing the most salient features of the entrepreneurial attitude of the respondents. Subsections 4.1 and 4.2 comprise the descriptive results of the questionnaire survey. Subsection 4.3 describes the resulting clusters of entrepreneurial intentions built upon the responses to the questionnaire.

4.1 Sociodemographic data

Regarding the effect of sociodemographic (external) factors on entrepreneurial intention (Dubey & Sahu, 2022; Chafloque-Cespedes et al., 2021, Yi, 2021; Quaresma et al., 2020; Nguyen et al., 2019) is important to highlight that the respondents are mostly female (74%), aged between 17 and 25 years (80%). They are single (89%) and most of them do not work and only study (55%). They attend classes in IPCA (61%), are mainly bachelor's students (65%). The respondents' students have no education and training in entrepreneurship (55%) which is in line with GUESSS Portugal Report 2018 (Quaresma et al., 2020).

Table 1. Summary of socio-demographic characteristics

Variables	Results	Variables	Results
Gender	Female: 74%	Professional Status	Students (only): 55%
Age	17-25 years old: 80%	Higher Institution	IPCA - 61%
Civil Status	Single: 89%	Cycle Studies	Bachelors: 65%
Education and Training in Entrepreneurship <=> NO: 55%			

The sociodemographic variables within Table 1 were initially considered throughout the use of clustering methods, although they were removed for the sake of parsimony, as their influence towards the cluster formation was inexpressive (see Section 4.3). In this study, the effect of

sociodemographic factors on entrepreneurial intention is not important. This can be explained by the fact that the students are all from the same scientific area (tourism), from two public institutions geographically close, with the same curricular structures and the same entrepreneurial ecosystems.

4.2 Entrepreneurial intention

The entrepreneurial intention was analysed according to three parameters: attitude, norms, and behaviour adapting Likert scales validated in the empirical and conceptual literature, namely by Autio et al. (2001), Krueger (1993), and Lee and Tsang (2001). Such parameters, i.e., answers to each question that belongs to a given parameter, form the input for the clustering algorithms.

Attitude

More than 75% of the respondents believe that they can lead groups and teams. Being self-employed would make them more independent in 78% of the cases, even if 67% of them feel it is risky to open a business. In the short term, opening their own business seems to be an attractive idea (70%), but too much work may constitute a problem to stop doing other enjoyable things for 45% of them. Students seem to believe that if they have their own business, they could earn more money (57%), they could be more successful, or will be able to achieve their goals more easily (56%). The pandemic crisis caused by Covid 19 was considered a break for 68% of them. This sample of students accepts the challenge of becoming a successful or fulfilled entrepreneur, if they get recognition (78%), fame (20%), earn money (83%), have autonomy (95%), and face challenges (87%).

Norms

Most students do not have a family background (79%), the family does not encourage them to open their own business (55%), friends are the ones who encourage them the most (54%) and parents do not create dynamics around this possibility (99%).

Behaviour

Most of the students think that they will be successful entrepreneurs (59%) and are aware that it is very difficult to achieve it (80%). They are self-confident and believe that they can build the trust of other people if they become entrepreneurs (64%). They can identify opportunities to creatively start a business (60%), are perseverant (66%), have a desire to start their own business soon (63%), and have already started planning their own business (38%).

4.3 Classification of entrepreneurial intention profiles using clustering algorithms

Based on the students' responses to the questionnaire, a clustering approach was carried out, aiming towards a classification of entrepreneurial intention profiles. Given that choosing the number of clusters is not an evident task, an agglomerative hierarchical clustering method was adopted. Such method has bottom-up nature, i.e., each observation (response) is a singleton cluster in its first iteration. The subsequent iterations are calculated using Ward's linkage function, which is arguably more suited to quantitative variables (Randriamihamison et al., 2021), as in the case of the variables selected from the questionnaire. Such function ensures that the variance of clusters grows as least as possible at each iteration, yielding more spherical, i.e., uniform, clusters.

The first approach consisted of considering the sociodemographic variables and entrepreneurial intention variables simultaneously. Within the sample, there was no statistically significant difference between the clusters formed with those two variable types, and the ones formed by entrepreneurial intentional variables only, i.e., the resulting contribution of sociodemographic

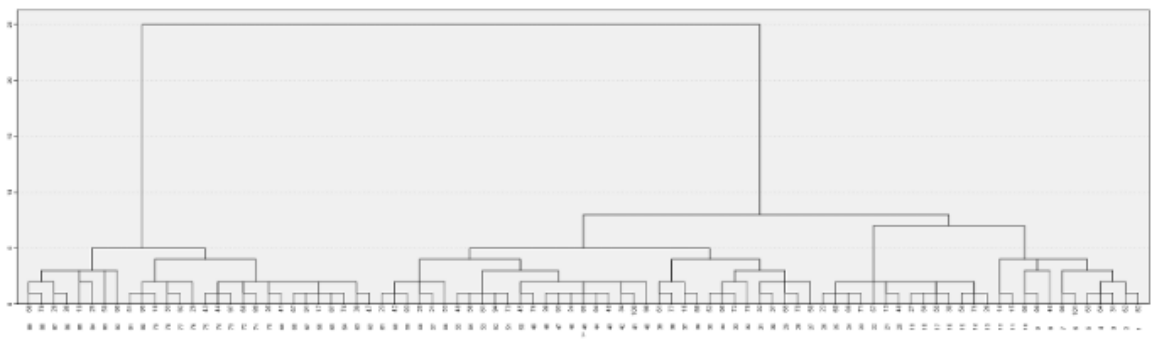

Figure 5. Resulting dendrogram from the agglomerative hierarchical clustering method applied with the Ward's linkage function. Based on such dendrogram, a k-means algorithm was applied (k=5), that also considered the value for the CH index.

variables towards the within- and between-clusters variance was inexpressive. Therefore, for the sake of parsimony, only the latter variables were considered as inputs for the clustering methods.

The resulting dendrogram (see Figure 5) allowed for the exploratory visualization of the clusters' hierarchy after several iterations. An initial grouping of 3 to 5 clusters was deemed adequate for providing a natural language description of each cluster without compromising its interpretability. In addition, we calculated the Calinski and Harabsz (CH) Index, which is an acknowledged measure for choosing the optimal number of clusters (Maulik and Bandyoapdhyay, 2002). Such index combines the within- and between-cluster variance as a means for evaluating the quality of the segmentation. The maximum value for the CH index was reached for $k = 5$ clusters.

Finally, using such value as input, we adopted the k-means clustering method, which yielded a set of clusters that were interpreted and described in natural language, given the mean values for each variable (see Figure 6 for an overview, and Appendix B for a detailed view). The mean values for each question were colour-coded to aid the visual exploration of the results and corroborated by providing a natural language identifier for each cluster.

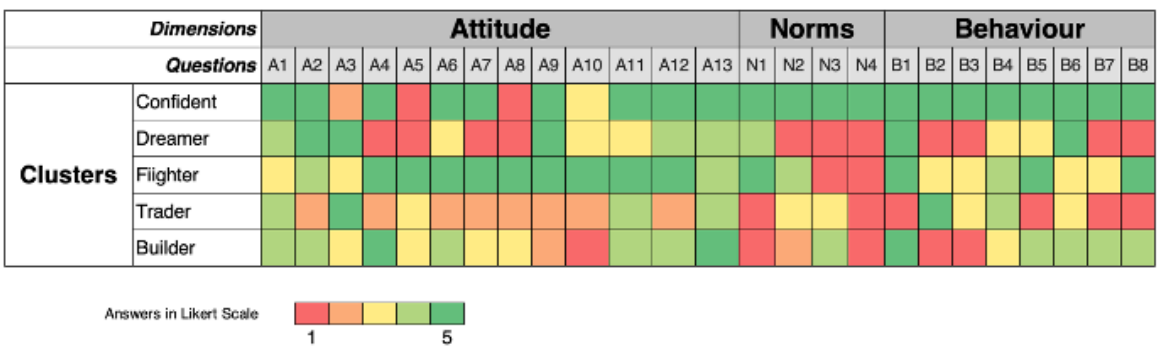

Figure 6. Overview of clusters according to the various questions within the survey, classified in terms of the following dimensions: attitude, norms, and behaviour. Each cell was colour-coded according to the mean value (in Likert scale) to the corresponding question, e.g., A1. Appendix B provides a detailed view of this figure, containing the mean values found for each question.

Cluster 1: **CONFIDENT**: students perceive themselves as leaders, are autonomous and want to have their businesses. They are hardworking, and independent, and wish to earn money, be successful and achieve goals. They have an internal locus of control and regarding success, they value recognition, money, autonomy, and challenges. They have entrepreneurs in the family, and everybody incentive them to create their own business. They feel successful, and don't

foresee obstacles. They find a lot of opportunities and creatively build their own business with perseverance.

Cluster 2: **DREAMER**: students perceive themselves as autonomous, have risk aversion, and do not intend to have their own business, although they are hardworking. Regarding success, they value recognition first, followed by autonomy and challenges. They feel alone in venturing, but successful as entrepreneurs. They are persevering.

Cluster 3: **FIGHTER**: students want to have their own business, money, success, and achieve goals. They are hardworking, have an internal locus of control, and don´t appreciate challenges. They have a family background, but no support. They can detect and identify opportunities, are creative, and already started to plan their own business.

Cluster 4: **TRADER**: students have risk aversion, some leadership skills, and valuing for success money, and challenges. No family background and no encouragement from parents. They believe that there are no obstacles for them to become successful entrepreneurs and can identify some business opportunities.

Cluster 5: **BUILDER**: students want their own business and like to challenge themselves. They have some leadership skills, and autonomy and enjoy making money. They don´t value fame and have plenty of encouragement from friends. They are creative, persevering, and have already started to plan their business.

5 Conclusion

In this study, we have focused on entrepreneurship, which has been recognized as an essential driver of innovation and creativity in modern society. Despite relatively low success levels, entrepreneurship develops certain traits in individuals which make them stronger and more apt at facing certain challenges and hence has been embraced by governments worldwide as a priority. Entrepreneurial intention profile recognition can be an excellent tool for better developing the necessary skills for the 21st century. Higher education can better work with its students according to their attitudes, norms, and behaviours.

This exploratory nature of this study suggests that it should be replicated in other contexts. However, due to its dimension (101 survey respondents from a population of 300 students), conclusions cannot be generalized, and further research is encouraged in other domains of knowledge and within a larger universe of students and institutions, arguably by applying the methodology herein proposed. For instance, the adoption of hierarchical clustering methods and the analysis of information criterion, e.g., the CH index, allows identifying the adequate number of clusters, and could be applied to other academic contexts to aid profiling the same (or new) profiles of entrepreneurial intentional. Nevertheless, better clustering knowledge can help decision-making and increase the motivation levels of all involved stakeholders. According to the obtained results, five entrepreneurial intention profiles (clusters) were found in this study, namely confident, dreamer, fighter, trader, and builder. This is the main contribution of this study to the literature, which may help entrepreneurship program administrators and students alike to improve their entrepreneurial capabilities. Today students want a more proactive involvement in their education, especially at the level of Higher Education Institutions. The need to know the students' profile and adapt the teaching methodologies to their expectations is a critical factor for the success of the institutions themselves. The changes in society and the generated dynamics justify a deep look at these issues.

In fact, establishing a favourable entrepreneurial ecosystem can minimize the fear of failure and hesitation in taking entrepreneurial actions. The government and educational institutions must

work together to develop policies that foster entrepreneurship, provide students with financial support, and create an environment conducive to entrepreneurialism. Such measures could help alleviate students' concerns about entrepreneurship. It may also be valuable to enhance the psychological education of students, given that entrepreneurship is a challenging and lengthy process, requiring a rational and confident outlook on the future.

The main limitations of this study are the non-representativeness of the sample, and therefore extrapolations should not be made. Another limitation is linked to the combination of three components as one construct, something that is not already totally validated in the literature review. However, many of the cognitive and affective processes in pre-entrepreneurial decision-making and decision-making processes are driven by physiological/neurological factors (Krueger & Welpe, 2014; Liu et al., 2022), so drawing on neuroscience could be a complementary resource for studying entrepreneurship, in particular for increase the locus control and self-confidence.

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Appendix A: Questionnaire

This appendix contains the questionnaire sent to the students (originally in Portuguese). The questions (statements) related to entrepreneurial intention were coded in terms of their category, i.e., attitude, norms, behaviour.

The questions below allowed answers in the integer range of 1 (strongly disagree) to 5 (totally agree).

Attitude (A)

A1. I am able to lead groups and teams.

A2. I feel more autonomous workwise when working for myself instead of working to another person or entity.

A3. Starting a new business is risky.

A4. In the near future, I do intend to start my own business.

A5. If I start my own business, I may become overwhelmed and sacrifice my time devoted to personal duties.

A6. I can earn more if I start my own business.

A7. If I start my own business, I am more likely to succeed and reach my goals.

A8. I consider the COVID-19 pandemics a bottleneck to my entrepreneurial ideas.

A9-A13. I would accept the challenge of becoming a successful and personally fulfilled entrepreneur due to:

A9. Becoming more autonomous workwise.

A10. Earning more.

A11. Becoming famous.

A12. Being recognised by my peers and friends.

A13. Accepting new challenges.

Norms (N)

N1. I was raised in a context in which people prefer to work independently than working for another entity or person.

N2. My family supports my intentions of starting my own business.

N3. My friends support my intentions of starting my own business.

N4. My parents work independently and support my intentions of starting my own business.

Behaviour (B)

B1. I will become a successful entrepreneur.

B2. There are no obstacles towards me becoming a successful entrepreneur.

B3. If I become an entrepreneur, I will be able to gain the trust of other people.

B4. I consider myself capable of finding a good business opportunity.

B5. I consider myself creative enough to start my own business.

B6. I consider myself extremely determined to become a successful entrepreneur.

B7. I am willing to work independently and not working for another entity.

B8. I have already started planning my own business.

Appendix B: Clusters of entrepreneurial intention profiles

The Figure 7, below, depicts a detailed view of Fig. 5. The mean value for each question within each cluster is presented, based on the Likert scale adopted for each question. The text for each question (statement) can be found in Appendix A.

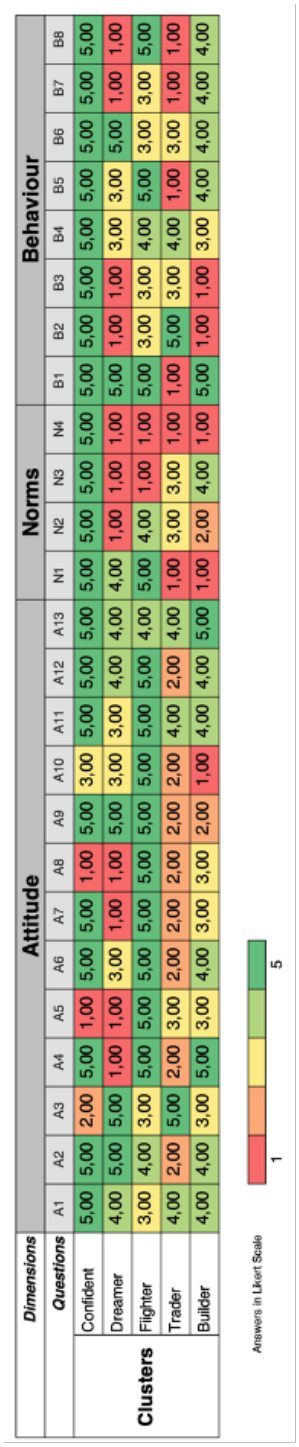

Figure 7

Biographies

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