Proceeding Paper

Identifying Veterinary Students' Attitudes on Entrepreneurial Intentions: A Two-Step Cluster Analysis †

Athanasios Batzios [1,*] , **Vagis Samathrakis** [2] , **Alexandros Theodoridis** [3] , **Georgia Koutouzidou** [4]
and Alexandros Kakouris [5]

[1] School of Agriculture, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece
[2] Department of Accounting and Information Systems, International Hellenic University,
     57400 Thessaloniki, Greece; samavagi@gmail.com
[3] School of Veterinary Medicine, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece;
     alextheod@vet.auth.gr
[4] Department of Agriculture, University of Western Macedonia, 53100 Florina, Greece;
     koutouzidoug@gmail.com
[5] Department of Management Science and Technology, University of Peloponnese, 22100 Tripolis, Greece;
     akakouris@uop.gr
*   Correspondence: thanos.batzios@gmail.com; Tel.: +30-6972352326
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Abstract: In this paper, the attitudes of veterinary students concerning the "factors driving their entrepreneurial intentions" and the "effects of family and wider environment on starting a business" were analyzed using Two-Step Cluster Analysis. A survey was conducted on 105 veterinary students who were asked to indicate their "agreement" on certain individual issues. The analysis of the data collected resulted in two students' profiles with respect to the factors driving their entrepreneurial intentions ("The cautious students" and "The reluctant students"), and in three students' profiles with respect to the influence of family and the wider environment on starting a business ("The conscious students", "The cautious and conservative students" and "The well informed and decisive students"). The study's findings could contribute to reinforcing the actions of educational institutions towards targeted training of students on entrepreneurship/market issues.

Keywords: veterinary students' attitudes; Two-Step Cluster Analysis; entrepreneurial intentions

1. Introduction

Entrepreneurship is a dominant element of economic growth, promoting business innovation and technology adoption, creating new jobs and supporting the development of managerial talents [1–4]. Particularly during economic recession, enhancing entrepreneurship is an important tool of response [5] inversely related to unemployment [6,7], enabling young people to create their own employment opportunities and develop business ideas [8]. On the other hand, the intensification of knowledge and the increasing importance of lifelong learning are shaping a particularly complicated employment framework.

In this context, the choice of professional career by veterinary graduates is an important process that occurs mainly in the pre-degree stage, associated with a variety of work opportunities. In Greece, the veterinary profession is expanding and the prospects for employment are rather favorable due to the increasing demand for animal health and medical care services [9]. Simultaneously, a shift of veterinarians towards the private sector has been recently recorded [10], launching new market conditions and considerably influencing the students' entrepreneurial intentions.

Therefore, higher veterinary education institutions, in addition to the professional knowledge provided, should be integrated into the curricula of concrete education/training

on the entrepreneurial mindset and its role in establishing veterinary business ventures [4]. Entrepreneurship is not simply about setting up a business; it is primarily an entrepreneurial mindset, in terms of the ability to identify opportunities, evaluate them, and take action on those opportunities [11,12]. An entrepreneurial mindset is a combination of skills and features that can be used to create new sustainable business, while not being afraid of taking risks when needed [13]. Thus, entrepreneurial education/training would prepare veterinary students with skills and knowledge to be potential entrepreneurs [14,15], enhancing their entrepreneur intentions.

This study aims to investigate the entrepreneurial intentions of veterinary students and to categorize students into homogeneous groups, with the belief that this could contribute to developing targeted educational activities that would effectively guide students, enhancing their career intentions.

2. Materials and Methods

A survey was conducted on 105 veterinary students who declared their agreement on individual issues related to the "factors driving their entrepreneurial intentions" and the "effects of family and wider environment on starting a business". Four levels of agreement were used and the respective scores were attributed.

The collected data were statistically analyzed with Two-Step Cluster Analysis (TSCA) to identify possible students' profiles with respect to the variables of interest. TSCA is an exploratory multivariate method designed to identify natural groups of similar records within a dataset [16,17]. The method uses an algorithm that handles both categorical and/or continuous variables, and automatically determines the optimal number of clusters, based on values of either the Schwarz's Bayesian Criterion (BIC) or Akaike Information Criterion (AIC) [18–21]. The log-likelihood distance measure is used for categorical variables [22]. The clustering criterion (e.g., the BIC) is calculated for each potential model solution and the changes in BIC and in distance measure are assessed to determine clusters [17]. A model's "goodness" is assessed by the Silhouette coefficient of cohesion and separation, with values >0.2 being acceptable [23–25].

3. Results and Discussion

Regarding the sample structure, 62.9% of the respondents were female, indicating an increased female preference for the veterinary profession, which has also been reported by Henry and Jackson [26] in the UK. In total, 81.9% of the students were ≤24 years old and 48.6% had work experience, while 23.8% and 17.1% of the students' fathers and mothers, respectively, were entrepreneurs/freelancers, approaching the national rate of 22% [27].

The TSCA on the "Factors driving respondents' entrepreneurial intentions" resulted in two clusters (48.6% and 51.4% of respondents), with ratios of sizes and silhouette measures being satisfactory (Figure 1). The students' attitude on the issue "I have skills to start a sustainable business" is the most important (predictor importance: PI = 1.00) for cluster formation, followed by issues "I can manage the process of setting up a business" (PI = 0.59), "I know the practical details necessary to start a business" (PI = 0.55), and "It is easy to start/run a business" (PI = 0.48). Work experience and gender affect the students' attitudes, contrary to their family's residence and father's profession.

The model outcomes revealed that the first cluster "The cautious students" consists of students who to some extent agree that they have the skills to start a business (slightly: 76.5%; fairly: 23.5%), they could manage setting up a business (100.0%), they know the practical details to start a business (88.2%) and that they would find it easy to start/run a business (slightly: 60.8%, fairly: 21.6%; highly: 3.9%) (Figure 2).
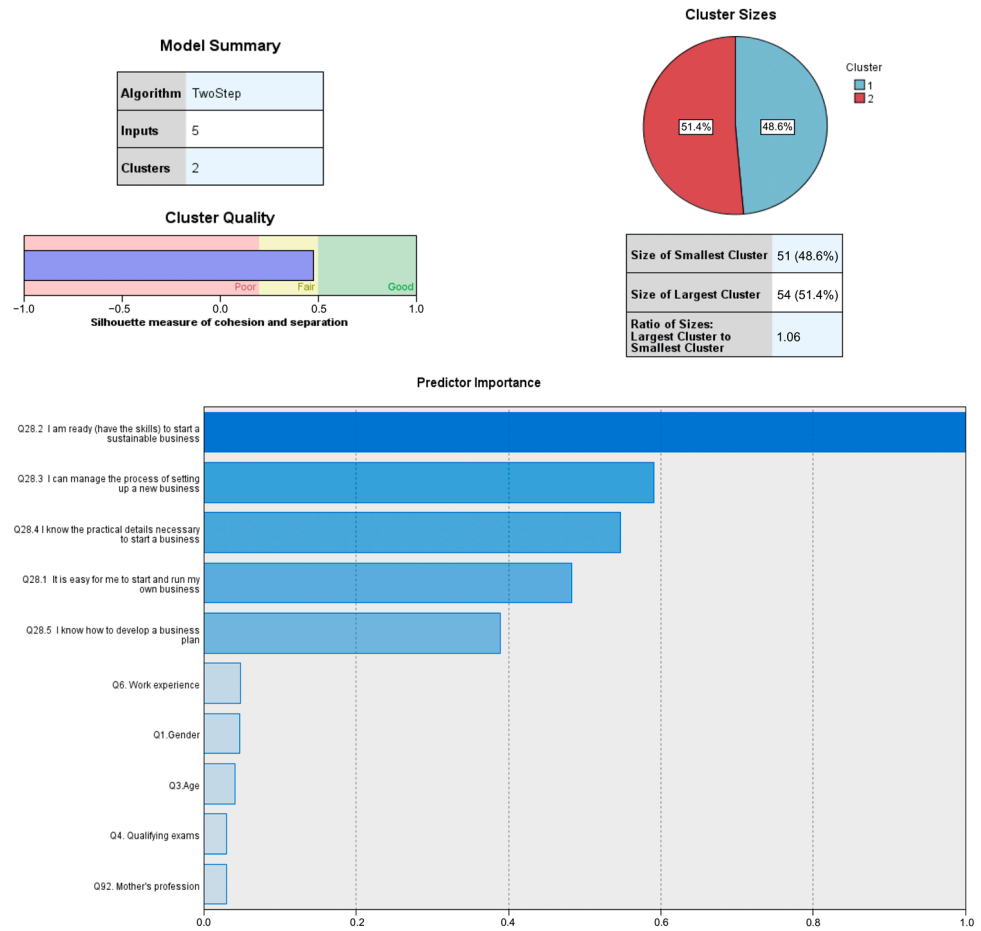
Figure 1. TSCA model summary and predictor importance of the "factors driving respondents' entrepreneurial intentions".
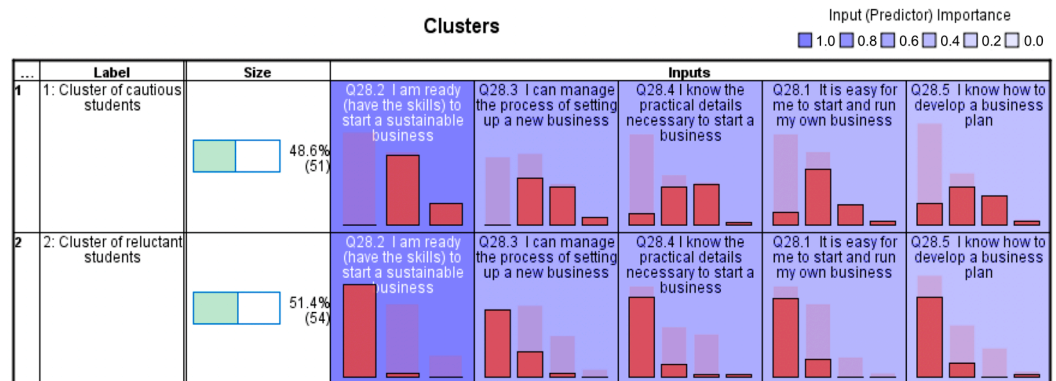

Figure 2. Input importance and cell absolute distributions of TSCA of the "Factors driving the respondents' entrepreneurial intentions".

Women dominate the cluster (54.9%), the most frequent students' age is ≤24 years old and 56.9% of the students have work experience. The second cluster "The reluctant students" includes students who do not believe that they have the skills to start a business (96.3%), could manage the process of setting up a business (70.4%), know the practical details to start a business (83.3%), would find it easy to start/run a business (81.5%), or even that they could develop a business plan (83.3%). Women dominate the cluster (70.4%), the most frequent age is ≤24 years old (81.5%), 59.3% of the students have no work experience and 48.1% have a mother working in the public sector.

Regarding the "Effects of family and wider environment on starting a business", the TSCA identified three clusters (37.1%, 27.6% and 35.2% of respondents), with satisfactory ratios of sizes and silhouette measures showing a good fit of cluster quality (Figure 3). The students' attitude on the issue "Acceptance by parents of any decision to start a business" is the most important (PI = 1.00) for cluster formation, followed by their attitudes on issues such as "Acceptance by colleagues..." (PI = 0.80), and "Acceptance by friends..." (PI = 0.44). Their mother's profession and gender affect the students' attitudes, contrary to work experience.
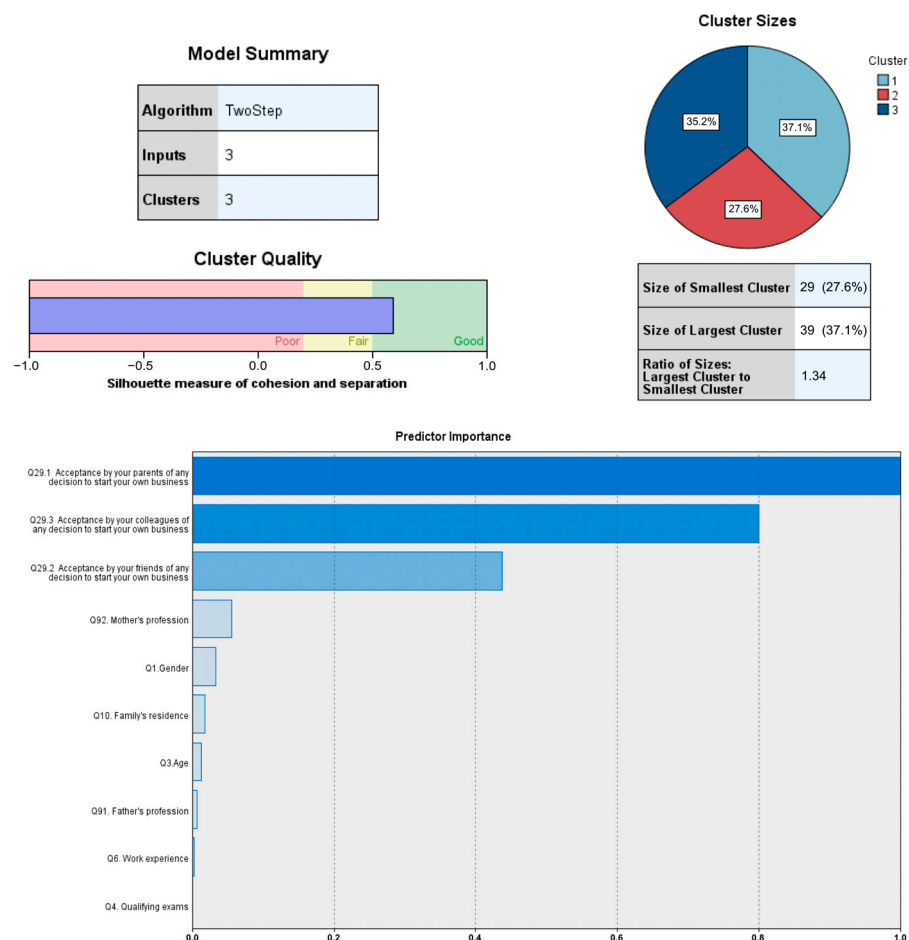

Figure 3. Model summary and predictor importance of the TSCA of the "Effects of family & wider environment on starting a new business".

In particular, the 1st cluster "The conscious students" consists of students who believe that starting a business would be highly accepted by their family (82.1%) and friends (53.8%), and fairly (59.0%) by their colleagues (Figure 4). Women dominate the cluster (69.2%), the most frequent age is ≤24 years old (89.7%), and 51.3% have work experience. The 2nd cluster "The cautious and conservative students" consists of students expecting moderate support from their family (100.0%), friends (75.9%) and colleagues (58.6%). Women dominate the cluster (69.0%), 51.7% have no work experience and 44.8% have fathers and 62.1% mothers working in the public sector. The 3rd cluster "The well informed and decisive students" is composed of students expecting a high level of support from their families, friends and colleagues to start a business. Women account for 51.4% of the cluster, 54.1% have no work experience, and 29.7% have an entrepreneur/freelance professional father.
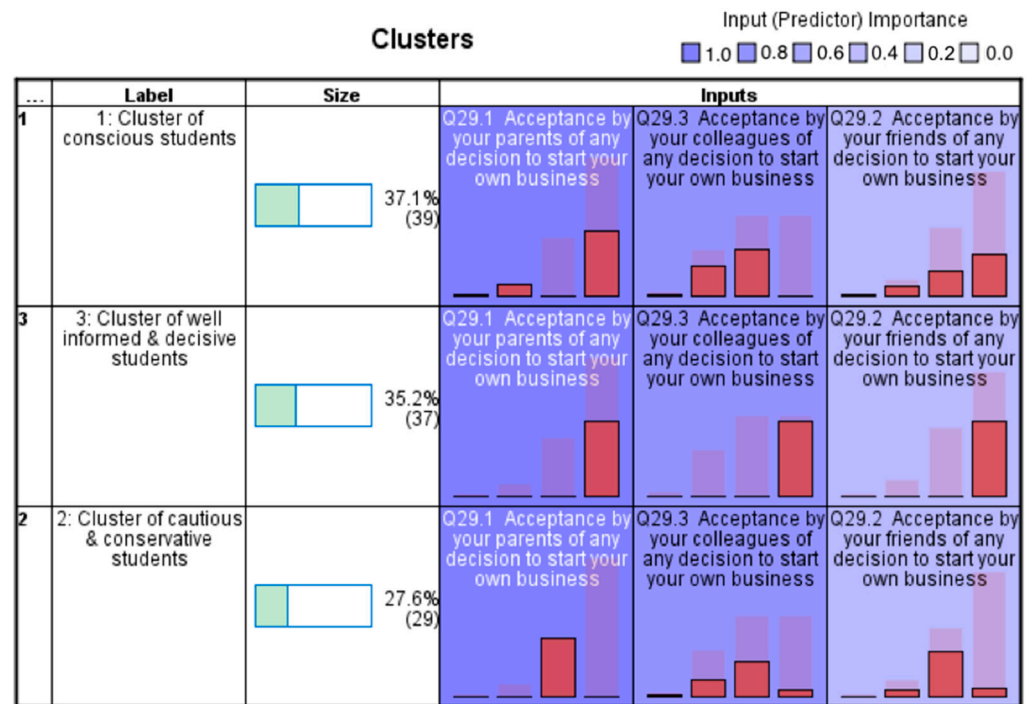
Figure 4. Input importance and cell absolute distributions of TSCA of the "Effects of family & wider environment on starting a new business".

4. Conclusions

The Two-Step Cluster Analysis resulted in two clusters, "The cautious students" and "The reluctant students" regarding the factors driving students' entrepreneurial intentions, and in three clusters, "The conscious students", "The cautious & conservative students" and "The well informed & decisive students" regarding the influence of family and the wider environment on starting a business. The segmentation of students highlights that the majority of students appear skeptical about the concept of creating a sustainable business, expressing uncertainty, perhaps due to the complex business framework in Greece. A high rate of students declared ignorance about the procedures/practical details of setting up a business, while family and the wider environment play a crucial role, affecting the potential decision to start a business.

The study's findings confirm the need for education/training of veterinary students on business and marketing issues. Based on the described profiles, a response to these aspects could be the implementation of targeted training seminars and workshops on entrepreneurship and marketing issues. The integration of entrepreneurship education with lectures on selected marketing and entrepreneurship issues, the organization of open career-days with the participation of students and veterinary professionals, and visits to relative business entities could be beneficial for the students, helping them to effectively utilize the experience gained through their planned internships in livestock farms and veterinary clinics.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study will be available upon request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

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