

Students' entrepreneurial behaviour – An eight-construct scale validation: A scale adaptation study

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Abstract

Entrepreneurship, especially among university students, measuring perception/tendency has been very popular in recent years due to reasons such as the importance of the subject, research applicability, reaching the target audience and relatively low research costs. In this context, it emphasises that the willingness, determination and predisposition of young people who will enter the business life to make a new venture and do their own business and their career planning are also important for entrepreneurial tendencies. In the context of this study, an adaptation study of the relevant scale developed by Schmidt Bohnenberger, Panizzon, Marcon, Toivonen and Lampinen into Turkish was carried out in order to determine undergraduate students' entrepreneurial behaviour. The validity and reliability studies of the scale were carried out with the participation of 185 undergraduate students studying in different departments. Exploratory factor analysis was used to serve structure validity. At the end of the study, a seven-dimensional scale consisting of 40 items explaining 89.62% of the total variance was obtained. The internal consistency coefficient of the scale calculated with Cronbach's alpha was 0.95. As a result, it contributed to the field by introducing a scale with proven reliability and validity.

Keywords: Entrepreneurship behaviour, undergraduate students, scale adaptation, validity–reliability.

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1. Introduction

The entrepreneurial career has come to a point where it is particularly encouraged at almost every stage of daily life due to reasons such as innovation and the increasing importance of creativity in the rise of countries. For this purpose, countries have taken steps to train entrepreneurs or to create an entrepreneurial culture, starting with basic education in recent years (Pazarcik, 2016). In this context, the role undertaken by higher education institutions by teaching entrepreneurship and transferring knowledge and innovation is very important (Kuttima et al., 2014; Nasr & Boujelbene, 2014).

In today's information society, due to the momentum created by globalisation, new types of universities such as entrepreneurial universities, corporate universities and virtual universities have emerged. In light of all these, increasing competition in higher education and mass education demands push universities to seek new resources and turn them into an entrepreneurial character (Sakinc & Bursalioglu, 2012).

When the studies on entrepreneurship education are evaluated in the literature, it is seen that the main focus is on entrepreneurship tendency, characteristics of entrepreneurship and entrepreneurship training programmes (Aydemir, 2018; Collins et al., 2004). When the literature is examined, the existence of studies written on entrepreneurship education in higher education also draws attention. Karabulut (2009) conducted a research to determine the entrepreneurship characteristics and tendencies of university students. As a result, it was determined that although most of her students received entrepreneurship training, they did not work in a newly established business, could not establish their own business and did not want to start their own business and become an entrepreneur when they graduate. Nasr and Boujelbene (2014) conducted a study on graduate students to evaluate the impact of entrepreneurship education received at the university on professional life. Sondari (2014) presented a conceptual framework that supports the importance of entrepreneurship education in building an entrepreneurial career. Bilge and Bal (2012) discussed the entrepreneurship tendencies of undergraduate and associate degree students in terms of education level.

1.1. Conceptual framework

When the recent studies in the field of entrepreneurship education in higher education are examined, it can be seen that Finkle (2020) studied the need for entrepreneurship faculty in higher education. As a result of the positive feedback received from faculty members and doctoral students, it was emphasised that the relevant faculties can be institutions that help university students reveal their creativity and talents in the globalising world. A similar study by Kunicina et al. (2019) studied the development of entrepreneurship skills for students' creative thinking support in higher education. In this context, the paper describes an approach that combines project-based learning method applied for the acquisition of product prototype design and planning skills by the students of electrical engineering branch. As a result, the students who make up the product prototype have had a real market experience.

Otherwise, academic collaboration, creative thinking skills and cooperative learning are among the other high-level skills acquired.

Another dimension of the research is the entrepreneurial tendencies of students for career planning. When the relevant studies in the literature are examined, it can be seen that Isik and Erdem (2018), within the framework of the entrepreneurial university approach, put forward a 'Career Development Centre Model'. As a result, developing the adaptability of university students in their education life and after graduation, generating innovative ideas and developing these ideas in a social environment awareness were raised in the context of the opportunity to offer and implement. Burton et al. (2016) have worked on a careers perspectives on entrepreneurship, and as a result, entrepreneurship is a milestone event not only in the careers of those who undertake it but also for those who find employment in new ventures.

In this study, an adaptation study of a scale existing in the literature on entrepreneurship skills in higher education was conducted. In addition, what needs to be done regarding the creation of scales used in research and the necessary validity–reliability conditions are mentioned. When the scales on the subject are examined, it can be seen that Gonzalez and Montoya (2020) improved the 'Social Entrepreneurship Competency in Higher Education' scale. As a result of the relevant analysis, a scale with proven validity and reliability has been gained to the literature. The scale is three-dimensional and consists of 30 items in total.

1.2. Main goal and importance of the research

Due to the growing interest in entrepreneurship and the potential benefits its promotion may bring to the community from higher education institutions, the specific objective of this research project is to develop and validate a specific instrument. The importance of entrepreneurship is increasing in the world and in our country. Universities, especially in the field of higher education, should ensure that students are aware of the effects of their students' creativity, endurance to stress, entrepreneurial motivation on their entrepreneurship tendencies and guide their students to entrepreneurship. In this context, the importance of a data collection tool that will reveal the entrepreneurial behaviour of students and lay the groundwork for future education or practices is envisaged.

As a result of a detailed literature review, especially since there are many entrepreneurship scales in local literature, there is no entrepreneurship scale in a more privatised current higher education. This situation was seen as a gap to be filled in the field. As a result of the research conducted, it was decided that the scale developed by Schmidt et al. (2018) is suitable for this purpose. In this context, it has been used to study undergraduate students at a public university in Turkey. In light of all these, it is thought that the relevant adaptation scale, whose validity and reliability is verified, will contribute to the literature.

2. Method

This research is a scale adaptation study. In this study, what needs to be done regarding the creation of scales used in research and the necessary validity/reliability conditions are mentioned. A detailed literature research was carried out to serve the purpose, and the theoretical framework of the scale was determined; the information about the research group and the development process of the scale and the steps followed are given below.

2.1. Sample groups

The validity and reliability studies of the scale were carried out with the participation of 185 undergraduate students studying in different departments. A personal information form was created by the authors to determine the demographic characteristics of the participants. Tables 1–3 present the students' demographic data.

- When the gender of the participants was examined, 99 female and 86 male students were identified.
- Participants' ages range from 18 to 26 years. Density was determined to be above 18–20 years.
- When the job of the fathers and mothers of the participants were examined, it was found that the father's job was generally 'worker' and the mother was a 'housewife'. This criterion has been specially evaluated because family-related inherited characteristics also affect the child's entrepreneurial behaviour.

Table 1. Department

Department	f	%
Computer Technology	19	10.2
Programming of Computer	18	9.7
Machine	26	14.0
Electrical	37	20.0
Architectural Restoration	31	16.7
Traditional Crafts	25	13.5
Food Business	16	8.6
Veterinary Medicine	13	7.3
Total	185	100

According to Table 1, the departments of the participants are various and it is seen that the density is in 'Electric department'.

Tables of students' demographic characteristics are below:

Table 2. Socio-economic level

Socio-economic level	f	%
Low	45	24.3
Middle	99	53.5
High	41	22.2
Total	185	100

When the socio-economic levels of the students were examined, it was determined that the highest frequency was in 'middle class'.

Table 3. Living place

Living place	f	%
Province	88	47.5
District	69	37.2
Town	11	5.9
Village	17	9.4
Total	185	100

When the living place of the students was examined, it was determined that the highest frequency was in 'province'.

2.2. Data collection tool

Information about the data collection tool used in the research is given in the following sections.

2.2.1. Students' Entrepreneurial Behaviour: An Eight-Construct scale

The adaptation steps of the scale are presented below.

2.2.2. Introduction of the scale

In this study, an adaptation study of the relevant scale developed by Schmidt et al. (2018) into Turkish was carried out in order to determine students' entrepreneurial behaviour (SEB). The original scale consisted of 40 items and a 5-point Likert scale was used. Consistency coefficient was determined as 'good' ($\alpha = 0.95$) and there was strong correlations between items ($r = 0.86$, $p < 0.00$). The Kaiser–Meyer–Olkin (KMO) test is a measure of how suited the data is for factor analysis. The test measures sampling adequacy for each variable in the model and for the complete model. KMO values between 0.8 and 1 indicate that the sampling is adequate (Sharma, 1996; Tabachnick & Fidell, 2007).

The factor loads of the scale items vary between 0.78 and 0.96. As a result, the scale can be accepted as a strong scale that tests the entrepreneurial behaviour of undergraduate students.

2.2.3. Adaptation of the scale

Permission was obtained from Schmidt, the person who developed the scale, to conduct the adaptation study of the SEB: An Eight-Construct scale. The English form of the scale was translated into Turkish by a language expert who spoke English and Turkish well. The created Turkish form was given to a linguist academician and controlled. According to the feedback received, the Turkish form of the scale was seen to be close to the English form. Then, opinions were received from three field experts, one psychological counsellor and one assessment and evaluation specialist to determine whether the relevant items served the purpose. As a result, the scale was finalised in line with the opinions and suggestions received from the experts.

After all these stages, the original form was applied to students studying in different departments of the Vocational and Technical Sciences High School of Kafkas University and Kars Vocational High School within 4 weeks. Structure validity was examined for the validity of the scale. The reliability study was examined with Cronbach's alpha coefficient and test–retest method.

The scale items' average and standard deviation values obtained as a result of the application to the group of 185 people are given in Table 4.

Table 4. SEB: an eight-construct scale items' average and standard deviation values

Items	X	SD
M1.	3.21	1.06
M2.	2.98	.805
M3.	2.97	1.21
M4.	3.01	1.35

M5.	3.21	1.08
M6.	3.80	.975
M7.	3.43	.899
M8.	3.14	1.22
M9.	2.45	.987
M10.	3.94	1.16
M11.	3.84	1.01
M12.	3.22	.989
M13.	2.84	1.05
M14.	4.24	1.12
M15.	3.42	1.24
M16.	4.23	1.04
M17.	3.99	.928
M18.	3.02	.889
M19.	3.98	1.17
M20.	4.01	1.01
M21.	3.65	1.22
M22.	3.88	.999
M23.	3.67	1.15
M24.	3.80	1.05
M25.	4.20	.807
M26.	3.09	1.29
M27.	3.26	.857
M28.	4.26	.921
M29.	3.84	1.08

M30.	3.36	.934
M31.	2.99	.776
M32.	2.88	.922
M33.	3.02	1.21
M34.	4.32	.990
M35.	4.82	1.13
M36.	3.03	.907
M37.	2.67	1.04
M38.	3.01	.855
M39.	3.36	.901
M40.	3.04	1.29
General Average	3.47	1.04

The average for the 40 items ranged from 4.82 to 2.45. Since the overall average of all items for the questionnaire is 3.47, it is revealed that the students generally 'agree' to the items related to entrepreneurial behaviour. The highest average item is M34: 'To be successful in life, it is necessary to run some risks'; the lowest average item is M9: 'I face the difficult situations of my daily activities as personal challenges'. Risk factors in entrepreneurship are listed as economic risk, social risk and career risk (Timuroglu & Cakir 2014; Yurtkoru et al., 2014). According to all these results, it is understood that the entrepreneurial behaviours of the students participating in the research are high.

3. Findings

3.1. Validity processes

Appearance, scope and structure validity were examined as validity study of Students Entrepreneurial Behaviour: An Eight-Construct scale. For appearance and content validity, one language specialist, three field specialists, one psychological counsellor and one assessment and evaluation specialist were consulted.

Exploratory factor analysis (EFA) was carried out for construct validity. According to the results of the EFA, a seven-dimensional scale consisting of 40 items explaining 89.62% of the total variance was obtained. According to the results obtained; the scale item with an eigenvalue greater than 1 was not detected so no item was removed from the original scale. The explained variance is 89.62%; this rate is

quite enough. The explained variance rate above 30% is considered sufficient in test development studies in behavioural and social sciences (Buyukozturk, 2018; Tabachnick & Fidell, 2007).

3.2. Exploratory factor analysis (EFA) Processes

The data obtained from the scale is normally distributed; 'principal component analysis' was used while carrying out factor analysis. This analysis calculates on total variance. Therefore, the specific variance observed in the variable itself on the factors and the error variance defined as the inexplicable part of the data set are also taken into account (Bandalos & Finney, 2010; Gorsuch, 1990; Schumacker & Lomax, 2010).

In order to carry out EFA, the KMO test, which tests the adequacy of the sample, was first looked at. The KMO value was found as 0.95. As this value is greater than 0.70, it is concluded that factor analysis can be made on these data (Buyukozturk, 2018; Hutcheson & Sofroniou, 1999). Secondly, by looking at Bartlett's Sphericity test ($\chi^2 = 5267.741$ $p = 0.000$), it has been determined that the data obtained differ significantly and are suitable for factor analysis. The KMO and Bartlett tests show that the data are suitable for factor analysis.

While determining the items to be included in the test as a result of the EFA carried out for the construct validity of the scale, it was noted that the factors forming the scale items were 1 and above, and the load values of the items were 0.30 and above. In addition, attention was paid to whether the items were included in a single factor or if there were at least a 0.10 difference between the factors in two factors (Buyukozturk, 2018). The results obtained from the EFA show that the scale has a six-dimensional structure. These dimensions are shown in Figure 1 on the scree plot chart.

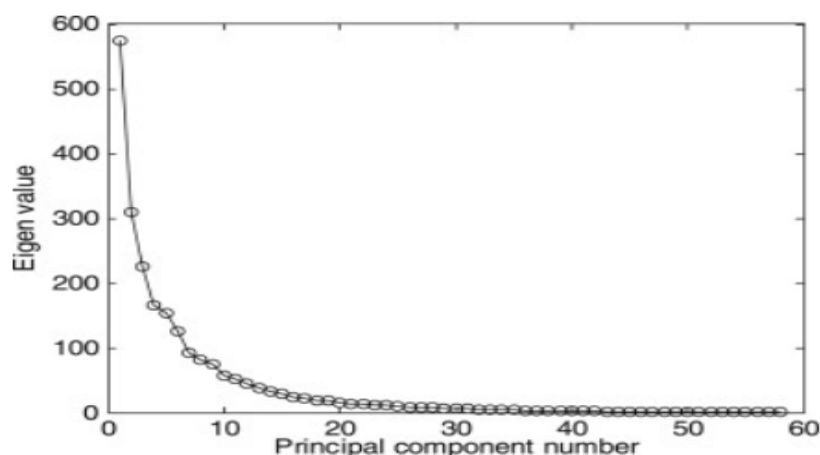


Figure 1. Eigenvalue factor number chart of the scale

The load values and the common factor variance in the factors with the items are shown in Table 5.

Table 5. Exploratory factor analysis results

Component	Sum of Subtraction of Loads								
	Initial eigenvalues			Square			Rotational Total of Loads Square		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
	17.412	43.530	43.530	17.42	43.530	43.530	16.54	42.453	41.904
	6.047	15.188	58.648	6.047	15.188	58.648	6.009	13.982	56.897
	4.505	11.263	69.911	4.505	11.263	69.911	4.303	10.103	68.900
	3.308	8.270	78.182	3.308	8.270	78.182	3.201	7.230	76.109
	2.104	5.259	83.441	2.104	5.259	83.441	2.018	5.102	81.954
	1.288	3.221	86.661	1.288	3.221	86.661	1.208	3.009	82.990
	1.183	2.959	89.620	1.183	2.959	89.620	1.083	2.675	89.620

When Table 9 is examined, it is seen that the scale consists of a seven-factor structure. It explains 89.62% of the total variance. These results show that the scale explains social entrepreneurship competency features well. The scale included a total of 40 statements. For Turkish adaptation study, the dimensions are seeing opportunities and building ideas (5), stability (6), social features (5), creativity skills (6), being planned (6), risking for success (5) and having leadership properties (7).

3.3. Reliability process

In order to determine the reliability of the research, the internal consistency coefficient of the six-factor structure of the scale, which was determined by Cronbach's alpha, was found to be 0.95. As a result of the analysis on the sub-dimensions of the scale, the following internal consistency coefficients were calculated with Cronbach's alpha: seeing opportunities and building ideas dimension 0.91; stability 0.89; social features 0.88; creativity skills 0.92; being planned 0.81; risking for success 0.86; and having leadership properties 0.81. According to many researchers, the reliability increases when the number of coefficients approaches 1 (Sekaran, 2003). Fraenkel and Wallen's (2006) reliability coefficient states that if it is less than 0.60, the scale is very weak, with 0.60. They indicated that it is good to be between 0.70 and within the acceptable limits or above 0.80. Accordingly, it can be said that the reliability coefficients of each of the related dimensions of the scale are good.

4. Discussion, Conclusion and Suggestions

EFA was carried out for the construct validity of the scale. According to the results of EFA, a seven-dimensional scale consisting of 30 items explaining 89.62% of the total variance was obtained. According to the results obtained, the scale item with an eigenvalue greater than 1 was not detected, so no item was removed from the original scale. The explained variance rate above 30% is considered sufficient in test development studies in behavioural and social sciences (Buyukozturk, 2018; Creswell, 2013).

In order to carry out exploratory factor analysis, the KMO test, which tests the adequacy of the sample, was first looked at. The KMO value was found as 0.95. As this value is greater than 0.70, it is concluded that factor analysis can be made on these data (Buyukozturk, 2018; Hutcheson & Sofroniou, 1999). Secondly, by looking at Bartlett's Sphericity test ($\chi^2 = 5267.741$ $p = 0.000$), it has been determined that the data obtained differ significantly and are suitable for factor analysis. The KMO and Bartlett tests show that the data are suitable for factor analysis.

The results obtained from EFA show that the scale has a six-dimensional structure. These dimensions are seeing opportunities and building ideas dimension (5) 0.91; stability (6) 0.89; social features (5) 0.88; creativity skills (6) 0.92; being planned (6) 0.81; risking for success (5) 0.86 and having leadership properties (7) 0.81.

When similar studies in the literature are examined, it can be seen that Liguori et al. (2019) examined entrepreneurship as a career choice in their studies with regard to intentions, attitudes and outcome expectations. The study was carried out with 320 undergraduate students. As a result, an entrepreneurial intention model is presented. Hisrich (2020), in his study, gave information about the processes, elements and activities required for a university to successfully create new entrepreneurship ventures. According to Tunio (2020), universities are institutions that serve to encourage the awareness and use of academic entrepreneurship in low-income countries as an opportunity for individuals and the society at large. In this context, the entrepreneurial ecosystem has been ingrained with the mutual support of educational institutions, mobile operators, supporting networks and other government organisations (Tunio, 2020). Moradi et al. made a qualitative study in the academic entrepreneurship ecosystem field, and as a result, the main institutional factors of the academic entrepreneurship ecosystem at these levels are in the national level, good governmental, political, economic, cultural, judicial and legislative institutions, in the industry level, industry, market institution and facilitating organisations, and in the organisational level, management, technology, culture, regulation and finance

institution. Palalic et al. (2020) examined entrepreneurship in terms of gender, and as a result, overall, female respondents scored better in entrepreneurial dimensions than males.

In light of all these data, the reliability and validity of the relevant scale were tested. This adapted scale is a good test for testing SEB. As a research proposal, the scale can be applied to different sample groups, thus different results can be obtained, which would shed light on future researches.

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