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Comparative Investigation of Entrepreneurship and Innovation Perceptions of Preservice Teachers

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Abstract

The aim of this study was to examine the entrepreneurship characteristics and innovation skills of the students studying in the departments of Computer Education and Instructional Technologies and students in other departments in the faculties of education. In this context, the students' perceptions of innovation skills and entrepreneurship were examined with a comparative approach by using a comparative relational screening research model in the study. The sample of the study consisted of 319 students studying at Ahmet Keleşoğlu Faculty of Education in Necmettin Erbakan University. Entrepreneurship and innovation skills scales were used to collect research data. According to the data analysis, there was a significant difference between students' perceptions of entrepreneurship in terms of department and gender. In addition, there are significant differences in terms of innovation skills according to grade levels. Significant correlations were found between students' innovation skills and perceptions of entrepreneurship.

Introduction

Schools, higher education institutions and other vocational education institutions encourage young people to develop a positive basic attitude towards entrepreneurship through the content of the curriculum. In addition, educational institutions can help those who are interested in entrepreneurship and young entrepreneurs in a concrete way by creating business plans for entrepreneurship, providing concrete technical information, practical environments within the university and outside enterprises, organizing competitions, mentoring practices, network support, etc. (Akar & Ustuner, 2019; Lambert, 2009). The quality of education has increased with the spread of entrepreneurship culture in universities.

In particular, university-industry collaborations have enabled students to anticipate the problems they might encounter in their business lives and develop solutions to these problems at a young age. In addition, students have been provided with the opportunity to get a job in enterprises where they have experience after graduation. University-industry collaborations have been effective in creating techno-entrepreneurship in this context (Jones-Evans et al., 1998). Technology entrepreneurship is interpreted by academics and industry professionals as a concept that will provide solutions to social problems in creating the required demands. Another definition of techno-entrepreneurship is "a new business-led style" and the creation of a completely new market with revolutionary breakthroughs in technology, creating high-potential, technology-based, intensive business opportunities. The basic concept is that technology is driven by techno-entrepreneurs (Autio, Jamsek, Soobik, & Olafsson, 2019; Harms & Walsh, 2015).

Entrepreneurship competence is one of the characteristics of entrepreneurship that is necessary to maintain business success by attitudes, beliefs, talent, personality, skills and behavioral tendencies. The key feature of entrepreneurship is that it is a combination of entrepreneurial attitude, entrepreneurial skills and entrepreneurial knowledge (European Comission, 2012). In order to become an entrepreneur and remain an entrepreneur, it is critical to employ dynamism, flexibility and self-regulation capabilities to sense uncertainty and adapt. Entrepreneurship competence requires entrepreneurial knowledge and entrepreneurial motivation. Entrepreneurial knowledge is divided into two as explicit knowledge, which can be conveyed, and implicit knowledge, which means skill and experience that cannot be conveyed. Entrepreneurship motivation is examined under two headings, entrepreneurial attitude and entrepreneurial intention (Markowska, 2011).

On the other hand, the concept of innovation is used more in the sense of novelty in Turkish and in fact, it does not have an exact equivalent in Turkish. When the concept of innovation is used together with the concept of novelty, three different meanings can identify: the process of developing a new product, a new product and the process of using a new product. In general, enterprises use the concept of innovation to search for new ideas, to evaluate new ideas, to use new ideas and realize innovation development stages (Güleş & Bülbül, 2003). It is possible to examine the commercialization stages with a structure with learning-application, abstract-concrete dimensions along with the discovery and learning, idea development, testing and implementation and commercialization realized in the innovation process. These stages and dimensions representing the innovation process are shown in Figure 1.

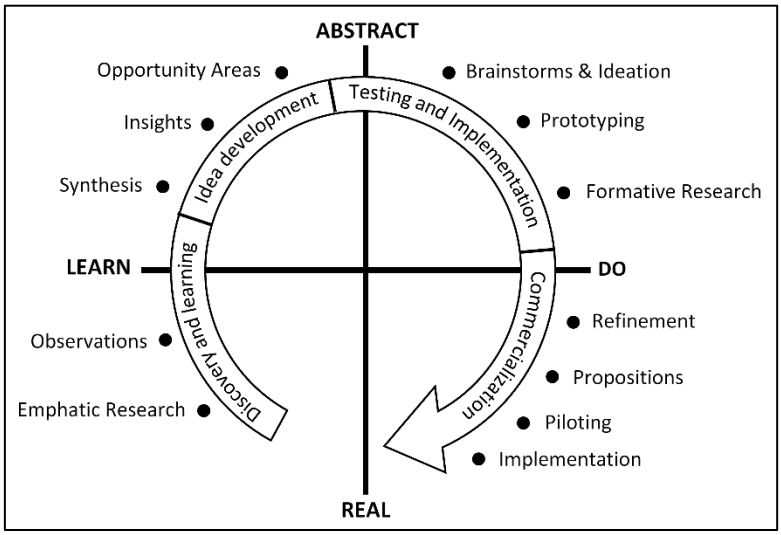

Figure 1. Stages representing the innovation process
(Source: https://www.flickr.com/photos/reloade/3971680221. Accessed: 15.04.2019)

The concept of "innovation" within the scope of globalization has emerged as an important concept in terms of nations' developing development policies and producing new strategies. In developed and developing countries, the transfer of information and technology between various institutions and organizations, especially universities, has led to the preparation of new action plans in order to gain a competitive advantage in international market (Jofre, 2012). Issues such as the impact of information generated on economic growth and the role of university technology centers in growth have been proven in various researches.

According to Schumpeter, innovation is the area of interest in combining and defining resources in a different way by blending them with new ideas and considerations. There are five basic forms of innovation (Schumpeter, 1978):

a) the development of new products with new consumer goods,
b) the use of new production methods with new techniques in production,
c) the development of new marketing techniques and the discovery of new markets,
d) creation of new resources for raw materials; and
e) the development of new methods and techniques in the organizational context, the emergence of new forms of industrial organizations, changes in working conditions.

The development and change of universities take place in relation to the transformations experienced by societies. Therefore, students, who are the most important stakeholders of universities, are expected to have innovative, entrepreneurial and versatile knowledge, attitudes and skills in order to keep up with the requirements of the age. It can be argued that competition increasing with globalization leads to serious transformations especially in socio-economic and cultural fields with the effect of digitalization. Professional life is also influenced by these transformations. Thus, new professions are emerging and the competencies expected of individuals are diversified. It is vital for universities to see, direct and manage these changes. Therefore, in the study, entrepreneurship and innovation skills of students studying in CEIT and other departments of education faculties were examined.

In this context, the following questions were addressed in the research:

- Do entrepreneurship and innovation skills of students at CEIT department and at other departments differ significantly?

- Do entrepreneurship and innovation skills of students at faculty of education differ significantly according to gender?
- Do entrepreneurship and innovation skills of students at faculty of education vary according to their grade levels?
- Do entrepreneurship and innovation skills of students at faculty of education differ depending on how successful they feel?

Method

In the study, the relationship between entrepreneurship characteristics and innovation skills of students at CEIT and other departments were analyzed in terms of demographic and school factors, and comparative relational screening model was used. Causal relationships between independent variables and dependent variables are tried to be determined by a comparative approach in the comparative relational screening model. However, the researcher does not have complete control over the independent variable(s) in the process of detecting the relationship (Williams, 2007).

This model was used in research to compare the entrepreneurship characteristics and innovation skills of students at faculty of education according to department, gender, grade levels and success factors. In this study, the level of entrepreneurship characteristics of university students predicting their innovation skills was examined. In addition, the level of predicting innovation skills of entrepreneurship characteristics of university students was examined within the scope of this model.

Study Group

In this research, the higher education institution to be evaluated is Necmettin Erbakan University. The population includes students who are studying in departments (CEIT, Primary School Teaching, Social Sciences Teaching, Science Teaching, Elementary Mathematics Education Programs) of Ahmet Keleşoğlu Faculty of Education in Necmettin Erbakan University. In this context cluster sampling technique, one of the probability sampling methods, was used in accordance with the aims of the study. According to Karasar (2005) sample units include element groups or clusters (schools, faculties, departments, etc.) in cluster sampling. The researcher has the flexibility to increase the sample size using this technique. The reason for choosing this sampling technique is that it is distributed in clusters in terms of variables investigated in the target population (university students). Therefore, the research was conducted on 319 undergraduate students studying in related departments of Ahmet Keleşoğlu Faculty of Education in Necmettin Erbakan University. 39.2% of the students participating in the research are students in CEIT department and 61.4% are in other departments. When gender factor is examined, we found that 60.2% is female and 39.8% is male.

Data Collection Tools

In this study where the entrepreneurship and innovation skills of education faculty students were examined, data collection processes were carried out systematically, and personal information form, entrepreneurship and individual innovation scales were used.

Entrepreneurship Scale

Entrepreneurship Scale developed by Yılmaz and Sünbül (2009) was used to determine the entrepreneurship characteristics students at CEIT and other department in line with the general purpose of the study. There are 36 items on the entrepreneurship scale. The five-point Likert scale items are scored as strongly disagree (1), disagree (2), undecided (3), agree (4) and strongly agree (5). The construct validity of the scale was examined by factor analysis. Scale items were observed to be collected in a single dimension. One-dimensional scale was reported to explain 47.3% of the total variance. Cronbach Alpha internal consistency coefficient calculated to determine the reliability of the scale was reported as 0.90 (Sünbül & Yılmaz, 2008; Yılmaz & Sünbül, 2009). The internal consistency coefficient of the scale was calculated as 0.92 in the study.

Individual Innovation Scale

For the purpose of the study, the Individual Innovation Scale, developed by Hurt, Joseph and Cook (1977) and adapted to Turkish by Sarıoğlu (2014), was used to determine the perceptions of the students of the department of business administration towards innovation skills. Each expression in the scale is scored as strongly disagree (1), disagree (2), undecided (3), agree (4) and strongly agree (5). Cronbach's alpha internal consistency coefficient of the original scale was reported as 0.89. The scores obtained from the scale items are evaluated by summing them in order to reveal the general level of innovation of the individuals.

The structure of the Turkish version of the scale was examined by factor analysis. As a result of factor analysis, 2 items were removed from the scale. The Turkish version of the scale consists of 18 items. The 18-item scale explained 49.33% of the total variance. In order to determine the reliability of the scale, Cronbach alpha internal consistency coefficient was calculated and internal consistency coefficient was reported as 0.77. Similar method was used in this study. Cronbach Alpha internal consistency coefficient of the scale was calculated as 0.91. Cronbach Alpha internal consistency coefficient is expected to be 0.7 and above. Coefficients lower than this value indicate that the reliability of the scale is low (Tavşancıl, 2005). The internal consistency coefficient obtained in this study showed that the reliability of the scale due to internal consistency was high.

Findings

When the table (see Table 1) is examined, it could be seen that the scores obtained from the innovation scale do not differ according to the departments, but the scores obtained from the entrepreneurship scale show a significant difference between the students ($p<0.05$). It was found that the perceptions of entrepreneurship of the students at CEIT department were significantly higher than the students of other departments.

Table 1. Comparison of Entrepreneurship and Innovation Skills Scale scores of students at CEIT and other departments

		N	Mean	Std. Dev.	t	p
Innovation	CEIT Department	125	76.83	7.97	1.37	0.17
	Other Departments	196	75.61	7.67		
Entrepreneurship	CEIT Department	125	165.18	16.83	10.04	0.00
	Other Departments	196	146.03	16.56		

When Table 2 is examined, it is seen that the scores obtained from the innovation scale do not show a significant difference according to the gender of the students ($p>0.05$). It was determined that male and female students who participated in the study had a similar level of individual perception of innovation. However when the table is examined, it is seen that the scores obtained from the entrepreneurship scale show a significant difference according to the gender of the students ($p <0.05$). It was determined that entrepreneurship perceptions of male students were significantly higher than female students' perceptions of entrepreneurship.

Table 2. Comparison of Entrepreneurship and Innovation Skills Scale scores of students at faculty of education by gender

		N	Mean	Std. Dev.	t	p
Innovation	Male	129	75.90	7.78	-.35	.72
	Female	192	76.21	7.82		
Entrepreneurship	Male	129	157.28	18.21	2.95	.00
	Female	192	150.94	19.28		

When Table 3 is examined, it is seen that the scores obtained from the individual innovation scale show a significant difference according to the students' grade levels ($p<0.05$). In the study, 3rd and 4th year students' perceptions of individual innovation were found to be significantly higher than 1st and 2nd grades. However, when the table is examined, it is seen that the scores obtained from the entrepreneurship scale do not show a significant difference according to the students' grade levels ($p>0.05$).

Table 3. Comparison of Entrepreneurship and Innovation Skills Scale scores of students at faculty of education according to grade levels

	Grade Level	N	Mean	Std. Dev.	F	p	Tukey HSD
Innovation	1	94	74.77	7.86	5.122	0.002	4-1;4-2 3-1;3-2
	2	77	74.45	7.41			
	3	81	76.95	7.20			
	4	69	78.70	8.13			
Entrepreneurship	1	94	152.78	17.85	0.204	0.893	
	2	77	153.65	24.93			
	3	81	152.91	16.92			
	4	69	154.96	15.61			

When Table 4 is examined, it is seen that the scores obtained from the individual innovation scale do not show a significant difference according to the students' feeling of success ($p < 0.05$). However, it is seen that the scores obtained from the entrepreneurship scale show a significant difference according to the students' feeling of success ($p < 0.05$). According to further analysis, the perceptions of entrepreneurship of students who consider themselves successful and partially successful were found to be significantly higher than students who described themselves as not successful.

Table 4. Comparison of Entrepreneurship and Innovation Skills Scale scores of students of faculty of education according to the feeling of success

		N	Mean	Std. Dev.	F	p	Tukey HSD
Innovation	Not Successful	126	76.70	7.54	2.355	.097	
	Partially Successful	145	76.30	8.14			
	Successful	50	73.94	7.16			
Entrepreneurship	Not Successful	126	160.42	13.73	69.656	.000	3-1; 2-1
	Partially Successful	145	155.73	15.76			
	Successful	50	129.52	21.05			

Table 5 shows the correlation coefficients calculated between the individual innovation and entrepreneurship perceptions of the students of the faculty of education. A correlation coefficient of 0.20 was calculated between the level of individual innovation and entrepreneurship perception. According to this finding, a significant positive correlation was found between students' individual innovation level and entrepreneurship perception.

Table 5. The relationship between scores of students regarding entrepreneurship and innovation skills

		Innovation	Entrepreneurship
Innovation	Pearson Correlation	1	.202**
	Sig. (2-tailed)		.000
	N	321	321
Entrepreneurship	Pearson Correlation	.202**	1
	Sig. (2-tailed)	.000	
	N	321	321

**. Correlation is significant at the 0.01 level (2-tailed).

When Table 6 is examined, it is understood that the regression model developed to test the effect of entrepreneurship perceptions of university students on innovation skills was found to be statistically significant ($R=0.202$; $R^2=0.041$; $p<0.001$). The perception of entrepreneurship explains about 4.1% of the total variance in innovation skills. This finding shows that entrepreneurship perception has a partial effect on innovation ability.

Tablo 6. Level of entrepreneurship characteristics of students of faculty of education predicting innovation skills

R	R^2	F	p	B	p
.202	.041	13.567	.000	.083	.000

Results and Discussion

In the study, the relationship between entrepreneurship characteristics and innovation skills of students at CEIT and other departments of the faculty of education was examined in terms of demographic and school factors, and significant differences were found in terms of variables. According to the findings of the research, entrepreneurship perceptions of university students show significant differences according to their gender. However, there is no significant difference in terms of innovation skills. According to further analysis, it is seen that male students have higher level of entrepreneurship perception than females. In the literature, some of the studies on entrepreneurship, which is expressed as an individual feature, did not find significant differences according to gender (Sünbül & Yılmaz, 2008) and in some studies, it was found that men exhibited more innovative and entrepreneurial behaviors than women (Arı, 1989). According to Goffe and Scase (1992), there are differences in male and female entrepreneurship depending on cultural and occupational factors. The entrepreneurial competence of men has been found to be high in many male-dominated sectors. However, it has been observed that the findings on gender entrepreneurship relationship show a great variety in the literature.

Another finding of the study was that the scores obtained from the entrepreneurship scale differed to the branch of university students. According to the findings of the study, the scores of the students studying in the CEIT department were significantly higher than the students studying in the other departments. However, no significant difference was found in the innovation skills of the students according to their branches. Similarly, the studies conducted by Rosenbusch, Brinckmann and Bausch (2011) and Matejun (2016) are in line with the findings of this study.

In this respect, the research findings of Rosenbusch, Brinckmann and Bausch (2011) and Matejun (2016) are similar to those of the thesis. Technology susceptibility, interests and applications are important in the creation of innovation potential and entrepreneurship competence of individuals in any field or sector. According to these researchers, the ability to adapt to technological innovations in producing unique performances of entrepreneurship in the sectors and to apply current and technological changes in the field of business provides important advantages to the entrepreneur (Matejun, 2016; Rosenbusch, Brinckmann and Bausch, 2011). Therefore, individuals participating in systematic and programmed trainings on technology show higher entrepreneurial characteristics.

Another finding of the study is that there are significant differences in innovation skills according to grade levels of students. In the study, the innovation skills of 3rd and 4th year students were found to be significantly higher than the 1st and 2nd year students. However, the scores obtained from the entrepreneurship scale did not show a significant difference according to the students' grade levels. These findings are similar to those of McKeon et al. (2004), Mustar (2009) and Neck and Greene (2011). Innovation skills are based on learning experiences in general (Daher, Baya'a, & Anabousy, 2018; McKeon et al. 2004; Walters, Green, Goldsby, & Parker, 2018). Therefore, students with a higher-class level provide more experiences both in their fields and in their innovative learning processes in life and thus show higher innovation tendencies.

The last finding of the study is related to the relationships between the Innovation Skills of Entrepreneurship Characteristics of students at Faculty of Education. In the study, a significant positive correlation was found between students' level of individual innovation and entrepreneurship perception. In addition, it was/ is found that entrepreneurship perception predicted innovation skill significantly. This finding is similar to the results of the studies conducted by Marion, Dunlap and Friar, (2012) and Newman et al. (2019). According to Marion, Dunlap and Friar (2012), the high impact of entrepreneurial personality traits can be mentioned in innovation competencies, especially in the act of showing innovation in a new job. There is a strong relationship between the student's entrepreneurial personality traits, current entrepreneurial intentions, perceived innovation abilities and personal initiatives. According to Newman et al. (2017), entrepreneurial personality traits exhibit a positive effect on entrepreneurial intentions and innovation skills, while timid and passive tendencies lead to indecisiveness in terms of entrepreneurial intentions and innovation skills, and thus indirectly affect their competence negatively in this regard.

Conclusions

According to the literature, entrepreneurship can be improved in school experiences and learning processes. In this respect, entrepreneurship courses can be included in the curricula of institutions that train teachers and school administrators. Action research can be conducted to reveal the place of entrepreneurship of graduate

teacher candidates working in different educational institutions in the corporate culture. In addition, longitudinal studies can be carried out for the development and quality of entrepreneurship among education employees.

In the case of university entrepreneurship, it is observed that universities are mostly evaluated and examined through academicians. Many studies have been conducted on the relationship between demographic characteristics and entrepreneurship tendencies of academicians. However, how the entrepreneurship conditions and activities of the universities affect the students has not been examined from a holistic point of view. In this context, the extent to which the university responds to the needs of students in terms of entrepreneurship and innovation can be investigated. In this regard, perceptions of academicians and students regarding innovative and entrepreneurial university conditions can also be investigated in many ways.

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