

## Identifying the prospective science teachers' understanding towards entrepreneurial skills<sup>1</sup>

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### Abstract

The aim of this study is to examine the prospective science teachers' understanding towards entrepreneurial skills. This study, which 146 prospective science teachers of 3<sup>rd</sup> grade at two state universities in Turkey have participated in, is carried out through the case study method. The data of the research are gathered with "Entrepreneurial Approach Interview Form (EAIF)". The acquired data are analyzed by using the content analysis method. It is observed that the relation between entrepreneurship and economy is particularly explained with several characteristics by about one third of prospective teachers, whereas the vast majority of them are unable to establish this relation or give meaningless replies as a result of the research. However, it is found out that the great majority of the prospective teachers are able to explain upon the opportunities of entrepreneurship on the basis of the cultural structure of society. It is seen that very few prospective teachers emphasize on creativity and innovation important in regarding to using entrepreneurial skill. Nevertheless, it is observed that integration of the prospective teachers' sense of entrepreneurship with technology is inadequate. In addition, it is understood that the vast number of the prospective teachers are incompetent about how they will be able to use the nature and environment when they put their opinions into practice (in the process of business establishment). Moreover, it is revealed that very few candidates are aware of performing the operations such as determining the business idea, making a preliminary assessment of the business idea and questioning the feasibility of the business idea. Furthermore, it is determined that almost all candidates do not have information about the process and content of preparing a business plan. These results show that the prospective science teachers' understanding towards entrepreneurial skill is quite weak.

**Keywords:** Science, the prospective teacher, the entrepreneurship skill.

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## 1. Introduction

In the twenty-first century, national economies have grown substantially through small and medium-sized businesses that offer new products and services. These businesses offer the latest and most effective areas of work to respond to social needs and changes. Moreover, these enterprises will create most of the career opportunities and the main source of new jobs for young people in the near future. Entrepreneurship is the most important skill that encourages individuals to innovation and competitiveness in a global and rapidly changing economy (Aldianto, Anggadwita & Umbara, 2018; Carree & Thurik 2010). Shane and Venkataraman (2001) describes entrepreneurship as identification, evaluation and exploitation of profitable opportunities. In addition, entrepreneurship can be considered as any effort made by an entrepreneur (Hatt, 2018). The tendency of some people to respond to opportunities is defined as an entrepreneurship and this is seen as an important skill (Omer Attali & Yemini, 2016). Today, the characteristics of entrepreneurial individuals are linked to various concepts such as creativity, critical thinking, analytical thinking, interpersonal cooperation, risk-taking, marketing, funding, seeking opportunities, and strategy development (Carvalho & Franco, 2015; Lackeus, 2015).

Recent research strongly emphasizes the role of entrepreneurship on addressing poverty, migration and unemployment issues (Rachana & Vineel, 2019). Since the individuals have the freedom to change, develop, grow and adapt their own conditions and contexts, there are personal freedom and liberal ideals at the core of entrepreneurship (Draycott, Rae & Vause, 2011; Jones & Iredale, 2010). Miller (1983) argues that an entrepreneur has the ability to develop new ideas, combine all available resources, and observe contexts to which he has paid little attention before. An entrepreneur takes risks by taking advantage of all possible opportunities and potential resources in order to increase profits and efficiency, develops creative ideas and dares to implement them (Hamel & Prahalad, 1991). Few people today have enough understanding of entrepreneurship to start a business. There are several difficulties of this skill that the individuals meet with. Therefore, important reforms and policies are needed in education to prepare individuals to cope with these difficulties (Morselli, 2019). Entrepreneurship education shares value creation as a common goal and this aim can have social, cultural or financial content (Lackeus, 2015). Entrepreneurship education encourages students to non-traditional thinking and skill sets so that they can benefit from all socio-economic substructures (Pounder, 2016). One of the aims to increase the number of entrepreneurial individuals through educations is to contribute to breaking the cycle of poverty and culture to trigger socio-economic renewal (Jones & Iredale, 2014). Today, the programs are implemented starting primary school to secondary, high schools and universities in many countries, which aims to help students comprehend some entrepreneurial features such as questioning, problem solving, analytical thinking, creative thinking, being opportunistic, taking personal responsibility, becoming a leader, taking risks, being innovative and cooperative work (Elo & Kurtén, 2020). Moreover, these programs aim to develop the students' potential to uncover business areas that will create economic value on a global scale especially in their own countries in the future. Lackeus (2015) points out that learning activities that can trigger students' entrepreneurial development should include assignments based on economic opportunities. Therefore, effective theoretical and practical content should be prepared in schools to help students gain entrepreneurial skills. There is a need for qualified teachers who understand the concept of entrepreneurship to guide students correctly in the first place. It can be said that as the professional background of teachers is stronger, they will be more effective so as to run entrepreneurship education program (Ruskovaara & Pihkala, 2015). This is because teachers who have gained entrepreneurship features and have known how to use these features in the context of opportunities can only make their students perceive the life skills required in the 21st century.

Today, universities are key instruments in order to found new knowledge economies in the twenty-first century (Blesia, Lek, Ratang & Hutajulu, 2019). Moreover, the universities play important role to raise highly qualified entrepreneurs who will create employment and competitiveness (Ertuna & Gurel 2011;

Galloway & Brown 2002). Nowadays, the most important one of the universities' institutional education goals is to educate entrepreneurial individuals who solve problems among disciplines, think creatively, are innovative and make an initiative (Elo & Kurtén, 2020; Hoppe, 2016). The individuals who should grasp and use these features today are perhaps science teachers. The individuals who have to perceive and use these denoted entrepreneurial features are probably science teachers today. This is because teachers must have new life skills like entrepreneurship in parallel with the scientific and technological developments in the field of science. Contemporary science education consists of the applications that lead to the acquisition of innovative skills such as entrepreneurial thinking, problem solving, and analytical thinking, questioning and creative thinking (Onwuachu & Okoye, 2012). When considered from the pedagogical perspective of entrepreneurship in science, this structure indicates the positive attitudes of teachers towards entrepreneurship, the adoption of student-centered pedagogical actions and authentic learning environments (Peltonen, 2015). In particular, it is very important for the university to comprehend both how prospective science teachers themselves will use the opportunities in the field and which educations will be provided for their students to grow up as entrepreneurial individuals in the future. Achor and Wilfred-Bonse (2013) emphasizes that the students should be given entrepreneurial insight especially through science education. In a similar manner, Deveci and Çepni (2014) note that entrepreneurship education plays an important role in science education due to the fact that it allows individuals to see the various career options that exist in the field of science. The involvement of entrepreneurship into science education programs enables them to create new jobs by instilling the ability of being creative and innovative to the individuals and by using the opportunities in science beyond their chosen career as a profession (Ejilibe, 2012; Ezeudu, Ofoegbu & Anyaegbunnam, 2013; Mbanefo & Eboka, 2017; Moemeke, 2013). When the researches on entrepreneurship in the field of science are examined, it is seen that the students are particularly focused on the development of entrepreneurial skills in professional fields such as engineering, pharmacy and agriculture (Afolabi, Kareem, Okubanjo, Ogunbanjo & Aninkan, 2017; Blimpo & Pugatch, 2019; Heinert & Roberts, 2017; Khorrami, Farhadian & Abbasi, 2018; Nwakaego & Kabiru, 2015). Increasing human capital with a qualified entrepreneurship education in science is a critical factor that drives the economic growth and sustainable development of countries (Afolabi et al., 2017; Olaniyan & Okemakinde, 2008). The need for science teachers who will be seen as a role model in order to raise individuals that can be self-employed in the future and be the source of economic dynamism and who will be able to provide them effective guidance to understand entrepreneurship is increasing day by day. Therefore, the first issue that must be resolved to develop the entrepreneurial skills of the individuals in science is to prepare qualified teachers seen as role models who have the spirit of entrepreneurship and show a tendency to use this. In addition, it seems inevitable for science teachers to open up a socio-economic field both individually and socially by using the characteristics of their field as in many professions in the future. It is wise to focus on the qualifications of prospective science teachers due to these reasons.

According to Akyurt (2018), it is very important to encourage university students to gain entrepreneurial skills and to embark upon an enterprise regardless of the discipline, and even to add this course to curriculum in order to contribute to the economics. The prospective teachers' understanding of this skill should be revealed in order to initiate the entrepreneurship education procedure within the scope of a course. This is because the results will direct the content of entrepreneurship education carried out with prospective science teachers. However, it is seen that there is no research that focuses on the entrepreneurial understanding of prospective science teachers both in the world and in Turkey. It is seen that the prospective science teachers struggle to lead their daily life after graduating particularly in Turkey today. Moreover, many prospective science teachers wait to be appointed by the Ministry of Education, experience economic difficulties and largely lose their professional motivation. Therefore, it is quite substantial to determine the prospective teachers' understanding of entrepreneurship in Turkey in terms

of evaluating their potential to open a new business space. Moreover, this study is very valuable in terms of determining the impact of prospective science teachers' university education on their entrepreneurial understanding and their potential to turn this into action in the future. In this context, the study aims to identify the understandings of the entrepreneurial skills of the prospective science teachers, which is one of their life skills. The problem of this study in accordance with this purpose is as follows: What do the third-grade prospective science teachers think about their understanding towards entrepreneurial skills?

### ***1.1. The entrepreneurship education in Turkey and the education of the prospective teachers in this context***

The concept of entrepreneurship has been included in the curriculum as life skills pertaining to the field in the context of science since 2018 in Turkey. The life skills involved in the science curriculum include skills such as analytical thinking, decision-making, creativity, entrepreneurship, communication and teamwork in relation to accessing scientific knowledge in the field and using scientific knowledge. Entrepreneurship competence in the curriculum expresses the ability of the individual to turn his thoughts into action [Ministry of National Education (MNE), (2018)]. Moreover, this competence not only includes creativity, innovation, taking risks but scheming and project management skill in order to achieve goals as well. In addition, this competence supports everyone not only at home and in society, but also in business life so that they can be aware of the context and conditions of their work and can take career opportunities; this is also the basis of the more unique knowledge and skills that people who engage or contribute to the commercial activities. It is aimed to provide this skill to students within the scope of science, engineering and entrepreneurship applications on the basis of units in the curriculum. For this purpose, students are expected to define a need or problem from daily life related to the issues discussed in the units in the first place. The problem is intended to improve the tools, objects, or systems used or encountered in daily life. In addition, problems should be addressed within the scope of material, time and cost criteria. Students are asked to create strategies and use promotional tools to market the product in order to develop entrepreneurial skills. The teacher plays a role in being promoter and leader, whereas the student plays a part in researching, questioning, explaining, discussing and turning the source of knowledge into a product upon performing these applications to develop entrepreneurship. The role of teachers is to make the students reach the level of ultimate thinking, product development, invention and innovation in this context. The teacher plays a role of a leader who shares the value, importance of science and the responsibility and excitement of reaching the scientific information with his students. The teacher encourages the students to improve their spirit, sense of research and their style of scientific thought and enables them to adopt universal moral values, national and cultural values and ethical principles within the applications.

The ability of science in providing input to the economy is deemed important in the science curriculum in Turkey. Each unit, subject and learning outcome have adopted an approach pursuing the production of technologies to fulfill the daily life needs in this context. The entrepreneurial skill is particularly defined as the most important role of the individuals who should have this ability to meet the changing needs of the societies in the field of science. Today, the countries compete with each other on preparing their citizens who will create value in their economy in the future. The acquisition of entrepreneurial skill through the various educations stands out compared to other fields of skills in many countries in this context. Moreover, the further researches are needed to make understand the special entrepreneurial processes in the field such as defining the opportunities, identifying the essential resources, drawing a business plan, to setting up and managing a business. The individuals understanding the entrepreneurial skills in the field of science and realizing that they can use it effectively will get an opportunity to make initiatives and to mobilize their potential to create means of livelihood in this field. Individuals who have gained the ability to use entrepreneurship in science will find the opportunity to add value to their lives, develop material culture and thus serve economic life. Entrepreneurship practices are integrated with science courses in parallel with each unit within the framework of this approach in the science curriculum (MNE, 2018).

Entrepreneurship cannot be taught as a traditional academic subject. In other words, it must have a strong connection between practice and real life (Sorensen & Davidsen, 2017). According to Gibbe (2005), pedagogy applied to entrepreneurship education should be based on the active role of learners in learning and thereby non-traditional teaching methods. McIntyre and Roche (1999) define entrepreneurship education as the process of providing individuals with the necessary concepts and skills to provide the opportunities ignored by others and to have the insight and self-confidence when the others hesitate. On the other hand, the basic structure of the education system is still based on the subject, so it is still important to obtain the topic information. Furthermore, science teachers largely spend their energies on properly teaching subject area. Therefore, there is a need to investigate how the effort to develop entrepreneurial skills and competencies can be achieved within the current educational structure (Elo & Kurten, 2020).

Teachers need to be trained on strategies to transfer these skills to students with the introduction of innovative skills into the science curriculum. The spirit of entrepreneurship emerges in the early years of life. Therefore, students can be greatly encouraged by teachers who can guide this skill correctly and help spread innovative thinking (Mbanefo & Eboka, 2017; Peltonen, 2015). Especially, it should be ensured that prospective science teachers perceive entrepreneurship in the university. The prospective science teacher's education on entrepreneurial skills should have two contents. The first is to teach prospective teachers how to transform their knowledge of science into an economic value in order to create a new business for them. Secondly, it should include pedagogical structures that will give the students how to gain entrepreneurial skills in the field of science in the future. Prospective teachers should focus on becoming practical about entrepreneurial skills and ensure the integration of theory and practice into these educations. Moreover, these entrepreneurial programs should create conditions for prospective teachers through various channels to experience entrepreneurship from the real world (Higgins, Refai & Keita, 2018; Warhuus, Tanggaard, Robinson & Erno, 2017). In addition, it is essential that prospective teachers be connected to social channels, which include a large number of successful entrepreneurial examples out of campus (Cao & Lei, 2010; Pounder, 2016; Weiming, Chunyan & Xiaohua, 2016). The prospective teacher not only conceives developing and managing entrepreneurial skills but also creates her spirit of entrepreneurship with these applications (Zhaoxin & Zhiqiang, 2013). It is recommended that learning be realized through entrepreneurial procedures in entrepreneurship education (Birdthistle, Hynes & Fleming, 2007; Fiet, 2000, 2001; Richardson & Hynes, 2008). In addition, it is vital that prospective science teachers should also be supported theoretically in terms of entrepreneurial skills.

Solomon (2007) argues that entrepreneurs who serve as coaches or consultants should have a lot of characteristics such as visiting the classes of entrepreneurship and inspiring prospective teachers through stories and making practical advice. Entrepreneurship educations should not only make prospective teachers feel the importance of developing valuable skills (problem solving, analytical thinking, teamwork, creativity) but require them to learn to start up their own business as well (Fejes, Nylund & Wallin, 2019). Most of the research on entrepreneurial education agrees that it is often categorized into four courses: "About", "For", "Through" and "Embedded" (Gibb, 2002; Pittaway & Cope, 2007; Pittaway & Edwards, 2012). Theory and content about entrepreneurship are often taught in the courses of "About". Traditional teaching methods are used in such entrepreneurship courses and these courses have a desire to raise awareness or share information (Pittaway & Hannon, 2008). It is intended that the individuals deal with concrete entrepreneurial tasks in the courses of "For". Moreover, these courses include tasks, activities and projects that will enable individuals to gain skills on entrepreneurship (Solomon, Duffy & Tarabishy, 2002). These courses are experiential and subject to questioning. It also aims to prepare for the future entrepreneurial efforts of individuals (Gibb, 2002). The courses of "Through" involve individuals performing the actions of an entrepreneur through the initiation of an enterprise. The individuals run "real" companies or consult in the context of entrepreneurship in these courses (Gibb, 2002; Pittaway &

Cope, 2007; Solomon et al., 2002). The last approach called “Embedded” includes the incorporation of the courses that focus on other disciplines or topics into the education (Handscombe, Rodriguez-Falcon & Patterso, 2008; Kuratko, 2005). It is emphasized that the individuals’ entrepreneurial potential distinguish in the courses called “through”. This is because this type of course allows individuals to imitate and simulate what entrepreneurs do (Robinson, Neergaard, Tanggaard & Krueger, 2016). However, these types of courses note that entrepreneurial learning is a practical process that develops through experiencing the knowledge, reflection, thinking and movement (Politis, 2005). It is widely accepted at the European level that entrepreneurship education should be added to the curriculum at all educational levels as both business oriented and non-business studies (European Commission, 2008, 2012, 2013). It is requested that entrepreneurial culture be given in schools starting from childhood and be continued until the individual gets into the labor market. From this point of view, the teachers of today and the future have very important tasks in the formation of this climate (Pan & Akay, 2015). In this context, prospective science teachers should make the most effective use of all defined course types in order to become entrepreneurs in the future and to provide their students with entrepreneurial skills. Furthermore, as Rae (2000) points out, all prospective science teachers should create stories about “who they may be”, “who they want to be”, and should work to develop their “entrepreneurial identities”.

## **2. Method**

The case study method is used to examine the prospective science teachers’ approach towards entrepreneurial skills in this study. The case study is a qualitative research method in which the researcher elaborates on one or more situations. The environment in which the situation exists is often emphasized in the case studies (Christensen, Johnson & Turner, 2014). However, it should be made clear whether the researcher intends to understand an individual event only or intends to understand something more general than a special situation in the case studies. In this context, the tendency of prospective science teachers’ entrepreneurial skills is found out at two different state universities and a number of theoretical explanations are developed. Therefore, this study is a general case study that aims to focus on a general situation rather than a specialized case.

### **2.1. Participants**

146 prospective teachers studying in third grade science teaching program at two state universities in Black Sea Region and Eastern Anatolia Region of Turkey participate in this case study. 36 male and 44 female prospective science teachers from the university in Black Sea Region and 23 male and 43 female prospective science teachers from the university in Eastern Anatolia Region participate in the study. This sample include the prospective science teachers who also participate in the pilot scheme of TUBİTAK project carried out by the researchers. The concept of entrepreneurship has been included in the science curriculum in Turkey since 2018. Within this period, science teachers are expected to have a perspective to integrate entrepreneurial skills in their courses. Therefore, the prospective science teachers need to determine their current situation and eliminate their deficiencies so that their students can use and develop their entrepreneurial skills in their courses and they can improve their own entrepreneurial potential in the future. Considering current science teacher foundation programs, it can be said that the studies for determining the entrepreneurial skills of the prospective teachers in the third and fourth grades and eliminating their deficiencies are more prioritized than other grade levels. However, it is understood that the participation of the fourth-grade prospective science teachers in these applications will be rather weak due to their appointment and exam anxiety. Thus, prospective science teachers studying in only the third grade of both universities are selected for this study in regard to the purposeful sampling.

## 2.2. Data collection tools and process

Considering the research objectives, a structured interview form is prepared for prospective teachers. The evaluation of the entrepreneurial skill with traditional methods is not often seen as an appropriate approach. Komarkova, Conrads and Collado (2015) draws attention to the fact that it may be more appropriate to evaluate individuals with various methods such as formative and summarizing methods, self-evaluation and project studies. In addition, the use of written business plans in the evaluation of individuals' entrepreneurial understandings is seen as one of the most valuable methods (QAA, 2012). However, when the relevant literature is examined, it is observed that a clear methodology on how to evaluate the entrepreneurial skills of teachers, teacher candidates and students in the field of science is not defined. For this purpose, a measurement tool is planned to be developed in order to fulfil this need in the literature. In this context, the focus is only on how to evaluate entrepreneurial approaches of prospective science teachers. A prospective science teacher must first know what the entrepreneurial skill is and have some characteristics related to this skill in order for that the teacher makes the secondary school students to improve their entrepreneurial skills. From this point of view, "*Entrepreneurial Approach Interview Form (EAIF)*" has been applied as a data collection tool for prospective science teachers. This form consists of 12 open-ended questions. These questions have been developed by a trainer and validated by a trainer and a science teacher together. The information about the studies on the validity and reliability of the questions in the interview form is shown in Table 1.

**Table 1.** The study on the validity and reliability of the "EAIF" questions

Before Validity Study	After Validity Study	After reliability study
1. What are the economic, social and cultural foundations of entrepreneurship?	1. What are the economic, social and cultural foundations of entrepreneurship? Discuss through examples.	1. What are the economic foundations of entrepreneurship? Discuss over an example. 2. What are the social foundations of entrepreneurship? Discuss over an example. 3. What are the cultural foundations of entrepreneurship? Discuss over an example.
2. What is the importance of being creative upon starting an enterprise?	2. What is the importance of being creative upon starting an enterprise? Discuss over an example.	4. What is the importance of being creative upon starting an enterprise? Discuss over an example.
3. What is the importance of using technology upon starting an enterprise?	3. What is the importance of using technology upon starting an enterprise? Discuss over an example.	5. What is the importance of using technology upon starting an enterprise? Discuss over an example.
4. How should be acted with the nature in the process of starting up a business?	4. How should be acted with the nature in the process of starting up a business? Discuss over an example.	6. How should be acted with the nature in the process of starting up a business? Discuss over an example.

5. a- How should an entrepreneur act upon making a new business decision?	7. How should an entrepreneur act upon making a new business decision? Discuss over an example.	7. How should an entrepreneur act upon making a new business decision? Discuss over an example.
b-What are the obstacles and incentives in the business you will set up upon making a new business decision?	8. What are the obstacles and incentives in the business you will set up upon making a new business decision?	8. What are the obstacles in the business you will set up upon making a new business decision? 9. What are the incentives in the business you will set up upon making a new business decision?
6. You want to start up a new business. Prepare a business plan.	9. You want to start up a new business. Prepare a business plan.	10- You want to start up a new business. You will prepare a business plan. Please briefly describe the sections that should be in the business plans accordingly.
7. What is the importance of design in an enterprise?	10. What is the importance of product design in an enterprise? Discuss over an example.	11- What is the importance of product design in an enterprise? Discuss over an example.
8. What are the significant features while purchasing an active business?	11. What are the significant features while purchasing an active business? Discuss over an example.	12- What are the significant features while purchasing an active business? Discuss over an example.

After the validity study, "EAIF" has been applied to the senior prospective science teachers and related revisions have been made and the test has been made ready for implementation.

"Entrepreneurial Approach Interview Form (EAIF)" was applied by researchers to prospective science teachers who participated in the study from both universities at the end of the spring semester in 2017-2018 academic year. Before the collection of the data, the purpose and importance of the study are explained to the participants and the necessary explanations are made to the participants about the permissions for the implementation of the necessary "Ethics Committee Approval Notification Certificate" and "EAIF". In addition, some explanations are made in the context of entrepreneurial skills and science curriculum before the implementation of the interview form. The syllabus of the prospective teachers is examined by the researchers and the most appropriate time periods are determined for the collection of the data in order to prevent the disruption of the education especially during the implementation of the interview form. A researcher at both universities has carried out this data collection process. Both researchers have collected the data within the same week. Since the number of questions in the interview



form is excessive and the answers should be detailed by the participants, the first six questions are applied to the participants between 10:00-12:00 in the morning and the following six questions between 14:00-16:00 in the afternoon after a break within the appointed week. During the implementation of the interview forms, researchers from both universities receive support from the faculty members of the department in order to ensure the reliability of the data. In this context, participants at both universities are divided into two groups and are provided to fill out these forms in two separate classrooms that are appropriate.

### 2.3. Data analysis

The acquired data through EAIF is subject to content analysis. The data acquired from each question are coded cooperatively by the researchers. The data obtained from the questions consist of the other codes according to the content of the questions, no answer and meaningless reply. The examples about the answers of the prospective teachers towards some codes are included at the bottom of the tables obtained from open-ended questions. Unlike other questions, the 10<sup>th</sup> question has been analyzed using requested business plan titles (URL 1) when supported by KOSGEB. The acquired data are made up of the categories called no-answer and the names of the business plan sections. The prospective teachers are coded as S1 ...S146 and the sample responses of them are presented in the section of results.

### 3. Results

The results obtained from the analysis of the collected data aimed at determining the third grade prospective science teachers' understanding towards the entrepreneurial skills are presented. The data acquired from the third grade prospective science teachers' answers to the questions about "What are the economic foundations of entrepreneurship? Discuss over an example." are shown in the following table.

**Table 2.** The results obtained from the 1<sup>st</sup> question in EAIF

Codes	f
Meaningless reply	89
Accelerating economic growth	26
Increasing diversity or quality through competition	13
Providing employment	9
Raising the level of prosperity	7
No answer	6
Making profit	5
Putting new product on a market	5
Increasing the use of domestic raw materials in production	1

\*Multiple codes are obtained from the prospective teachers' answers.

When Table 2 is examined, it is concluded that the 3<sup>rd</sup> grade prospective science teachers try to define the economic foundations of the entrepreneurship as "accelerating economic growth" ( $f = 26$ ), "increasing diversity or quality through competition" ( $f = 13$ ), "providing employment" ( $f = 9$ ). Most of the prospective science teachers define the economic foundations of entrepreneurial skills as in the code "meaningless reply" ( $f=89$ ). The replies of S68 and S46 are as follows.

Para

**Figure 1.** The 1<sup>st</sup> question replied by S68 in the code called meaningless reply

Girisimcilik sermaye kulbonok yapilari istiri. Kisi sermaye elle isteklerinin dolayli risk olur. Bu da ilke ekonomisine katkı saglatken, yeni is donetleri olusturur.

**Figure 2.** The 1<sup>st</sup> question replied by S46 in the code called accelerating the economic growth and providing employment

The data acquired from the third grade prospective science teachers' answers to the questions about "What are the social foundations of entrepreneurship? Discuss over an example." are shown in Table 3.

**Table 3.** The results obtained from the 2<sup>nd</sup> question in EAIF

Codes	f
Meaningless reply	128
No answer	7
Gaining prestige in society	4
Solving unemployment problem	3
Boosting people's self-confidence	2
Propensity for social problems / providing intercommunal cooperation	2

When Table 3 is analyzed, it is seen that very few of the prospective science teachers make definitions for social foundations of the entrepreneurship such as "gaining prestige in the society" ( $f=4$ ), "solving the unemployment problem" ( $f=3$ ), "boosting people's self-confidence" ( $f=2$ ), "propensity for social problems/providing intercommunal cooperation" ( $f=2$ ). It is understood that the most of the candidates give "meaningless reply". The answer of S13 is demonstrated in Figure 3.

- Toplumda yer edinmeyi  
- Sosyal zindini belli edebilir olmayi

**Figure 3.** The 2<sup>nd</sup> question replied by S13 in the code called gaining prestige in the society

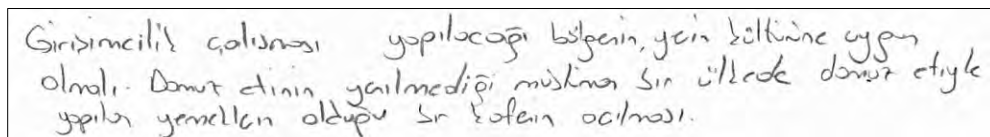
The results obtained from the 3<sup>rd</sup> question about "What are the cultural foundations of entrepreneurship? Discuss over an example." are shown in Table 4.

**Table 4.** The results obtained from the 3<sup>rd</sup> question in EAIF

Codes	f
Affection of entrepreneurial preferences	65
Effective in recognizing, carrying cultural values	25
No answer	17
Compliance with the customs, manners and traditions in society	15
Meaningless reply	14
Entrepreneurship tendency (in terms of family structure – child rearing)	8
Not harming cultural values (protect )	8
Attitude to the environment	3
Ensuring the development of culture	2

\* Multiple codes are obtained from the prospective teachers' answers.

When Table 4 is examined, it is seen that the prospective science teachers define the cultural foundations of entrepreneurship as “affection of entrepreneurial preferences” ( $f=65$ ), “Effective in Recognizing, Carrying Cultural Values” ( $f=25$ ), “compliance with the customs, manners and traditions in society” ( $f=15$ ). The answer given by S50 is as follows.



Girişimciliğin yapılması yapılacak işlerin, yerin költürüne uygun olmalı. Dönüş etinin yapılmadığı mümkün. Sınır ülkede dönüş etiykle yapılır yerelden olduğu için költürün yapılması.

**Figure 4.** The answer of S50 to the 3<sup>rd</sup> question as affection of entrepreneurial preferences

The results obtained from question about “What is the importance of being creative upon starting an enterprise?” Discuss over an example.” in EAIF are shown in Table 5.

**Table 5.** The results obtained from the 5<sup>th</sup> question in EAIF

Codes	f
Creating a competitive environment	63
Meaningless reply	51
Introducing different and various products	26
Making a gain (profit)	7
Sustaining economic growth	6
Improving quality	5
No answer	2
Cost reduction	2
Improving productivity	1

When Table 5 is examined, the candidates emphasize the approaches about the importance of being creative while starting an enterprise like “creating a competitive environment” ( $f=63$ , 43%), “introducing different and various products” ( $f=26$ , 17%). The answer of S56 is as follows.

Önemi çoktur yaratıcı fikirler ortaya  
atarak diğerlerinden öne geçmesine  
yardımcı olur

**Figure 5.** The 4<sup>th</sup> question replied by S56 in the code called creating a competitive environment

The results obtained from the 5<sup>th</sup> question about “What is the importance of using technology upon starting an enterprise? Discuss over an example” in the test are indicated in Table 6.

**Table 6.** The results obtained from the 5<sup>th</sup> question in EAIF

Codes	f
Meaningless reply	78
Provides accessibility and diversity for the customers	31
Provides convenience in production (in terms of machines, tools)	22
Enables more products in a short time	14
Provides efficiency in production	13
No answer	3
Enables technology to be transformed into economic value (commercialization)	1
Provides superiority in a competitive environment	1

\* Multiple codes are obtained from the prospective teachers’ answers.

When Table 6 is examined, it seen that the 78 of the prospective science teachers answer in the code called *meaningless reply*. The answer given by S38 is demonstrated in Figure 6.

Teknoloji her alanda olduğu gibi gelişimdede önemli. Herşi alanda ne yapılmı  
nasıl yapılmı ben daha farklı ne yaparım gibi sorular cevap bulmak  
girişimimizi daha etkili yapabilirsiniz.

**Figure 6.** The answer of S38 to the 5<sup>th</sup> question in the code called meaningless reply

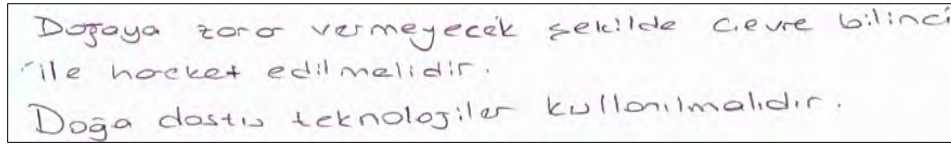
The results obtained from the third-grade prospective science teachers’ replies to the question “How should be acted with the nature in the process of starting up a business? Discuss over an example” are presented in Table 7.

**Table 7.** The results obtained from the 6<sup>th</sup> question in EAIF

Codes	f
Meaningless reply	105
Natural Raw materials and resources should be used consciously	15
Minimizing effects of harmful outcomes	9
No answer	8
Making an initiative on recycling	5
No use of products that will harm natural structure	5
Eco-friendly technologies should be used	3

\* Multiple codes are obtained from the prospective teachers' answers.

When the results obtained from the 6<sup>th</sup> question in EAIF are analyzed, very few of the candidates reply the question about how should be acted with the nature in the process of starting up a business as "natural raw materials and resources should be used consciously ( $f=15$ ), " minimizing effects of harmful outcomes ( $f=9$ ). The answer of S47 to the related question is as follows.



Dogaya zarar vermeyecek şekilde çevre bilinci ile hareket edilmelidir.  
Doga dostu teknolojiler kullanılmalıdır.

**Figure 7.** The answer of S47 to the 6<sup>th</sup> question as minimizing effects of harmful outcomes and eco-friendly technologies should be used

The data acquired from the candidates' answers to the question about "How should an entrepreneur act upon making a new business decision? Discuss over an example" are demonstrated in the following table.

**Table 8.** The results obtained from the 7<sup>th</sup> question in EAIF

Codes	f
Meaningless reply	60
To make a preliminary assessment of the business idea	32
To do feasibility research on business idea	30
To Determine a successful business idea	19
To Have motivation	16
To Prepare a business plan	15
To Set up a business	9
To Prepare a work program	8
No answer	1

When Table 8 is examined, it is seen that the candidates answer the related question mostly as “to make a preliminary assessment of the business idea” (f=32) and “to do feasibility research on business idea” (f=30). The answer of S17 to the 7<sup>th</sup> question is as follows.

İlk olarak motivasyonu seçilmiştir. Daha sonra iş fikrini belirlemek ve buna uygun bir çalışma programı hatırlanmıştır. Programın ardından ön değerlendirme yapıp bu konuyla ilgili araştırma yapması gerekir. Araştırma sürecinde önünü hatırlanmıştır.

**Figure 8.** The answer of S17 to the 7<sup>th</sup> question as having motivation, determining a successful business idea, preparing a work programme, preliminary assessment- feasibility of business idea

The results obtained from the 8<sup>th</sup> question in the test about “What are the obstacles in the business you will set up while making a new business decision?” are as follows.

**Table 9.** The results obtained from the 8<sup>th</sup> question in EAIF

Codes	f
Not having sufficient financial resources and capital	76
Perspective of social environment	23
Environmental conditions (geographical conditions)	8
Fierce competition	5
Staff	5
Access to the customer	5
Workplace	5
Time	4
Lack of knowledge and experience	4
Harming nature	3
Cultural differences	3
Family pressure	2
Employee satisfaction	2
Fail to profit	2
Negative profit	2
Promotion	2
Bureaucratic procedures (certificate, etc.)	2
National economy	2
High interest rate	1
Not to obtain the desired result	1
The excessive numbers of partners	1
Planlessness	1

Psychological breakdown	1
Production issues	1
Tool-appliance- machine	1

The candidates state that the code called "*not having sufficient financial resources and capital*" ( $f=76$ ) is the leading obstacles in the business you will set up while making a new business decision.

The results obtained from the 9<sup>th</sup> question in the test about "What are the incentives in the business you will set up while making a new business decision?" are as in Table 10.

**Table 10.** The results obtained from the 9<sup>th</sup> question in EAIF

Codes	f	
No answer	68	
Meaningless reply	26	
Financial resources (sponsor)	15	
Loans provided by banks to entrepreneurs	11	
Strong motivation	9	
Promotion	3	
	The ones only write governmental incentives	14
	KOSGEB	2
	Support for woman entrepreneurs	1
Government support	Support for young entrepreneurs	2
	Animal support	1
	Tax exemption	1
	R&D works	1
EU (European) support		1
Feeling of prosperousness		1

\* Multiple codes are obtained from the prospective teachers' answers.

When Table 10 is examined, it is seen that very few of the candidates mention "*loans provided by the banks to entrepreneurs*" ( $f=11$ ) and "*government support*" ( $f=22$ ) about the provided incentives in the business they will set up.

The results obtained from the question about "You want to start up a new business. You will prepare a business plan. Please briefly describe the sections that should be in the business plans accordingly." are shown in Table 11.

**Table 11.** The results obtained from the 11<sup>th</sup> question in EAIF

Section	Codes	f
1. General information	1.1. Information about Entrepreneur	-
	No Answer	146
	1.2. Business Idea	69
	No Answer	77
2. Information related to entrepreneur /partner and business	2.1. Why You Set Up a Business With a Partner Or Alone and The Importance of Your Partners To Succeed If Any	-
	No Answer	146
	2.2. Business Idea And Why To Choose	22
	No Answer	124
	2.3. Mission and Vision of Business	3
	No Answer	143
	2.4. Short-Term Goals (1 <sup>st</sup> Year )	-
	No Answer	146
	2.5. Medium and Long-Term Goals ( 2 <sup>nd</sup> year and Above)	6
	No Answer	140
3. Market knowledge and marketing plan	3.1. Market Size, Targeted Market Share	-
	No Answer	146
	3.2. Market Profile	22
	No Answer	124
	3.3. Competitor Analysis	5
	No Answer	141
	3.4. Production/Marketing/ Sales Targets	-
	No Answer	146
	3.5. Sectoral Developments, Assessment about Opportunity and Threats	2
	No Answer	144
	3.6. Predictions for Unexpected Situations	5
	No Answer	141
	3.7. A Product /Service Promotion	-
	No Answer	146
	3.8. How to Create product/service price	4
No Answer	142	
3.9. Site Selection and Its Reason	64	
		714



	No Answer	82
	3.10. Access Channels to Customer	21
	No Answer	125
	3.11. A Product/ Service Promotion Plan	17
	No Answer	129
4. Production / service plan	4.1. The Stages of Production / Service Delivery Process	1
	No Answer	145
	4.2. Workflow Diagram	-
	No Answer	146
	4.3. Standards, Documents, Licenses and Permissions Required in the Production/Service Delivery Process	8
	No Answer	138
5. Management plan	5.1. Organizational Chart	-
	No Answer	146
	5.2. Qualification, Duties and Responsibilities of the Staff	18
	No Answer	128
6. Financial plan	6.1. Initial Costs and Other Initial Expenses	41
	No Answer	105
	6.2. Operating Expenses	4
	No Answer	142
	6.3. Cash Projections	11
	No Answer	135
	6.4. Breakeven Point	9
	No Answer	137
6.5. Funding from Equity and/or Other Sources	16	
	No Answer	130
	Meaningless reply	9

\* Multiple codes are obtained from the prospective teachers' answers.

When Table 11 is analyzed, it is understood that most of the third-grade prospective science teachers do not mention the necessary sections in order to prepare a business plan.

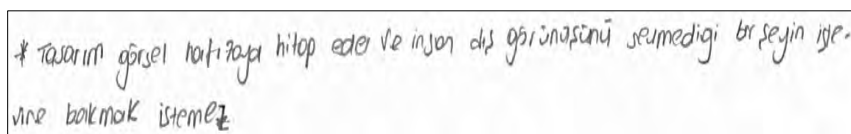
The results obtained from the question 11<sup>th</sup> about "What is the importance of the product design? Discuss over an example" are shown in Table 12.

**Table 12.** The results obtained from the 11<sup>th</sup> question in EAIF

Codes	f
Attract attention – arouse curiosity	61
Meaningless reply	53
Directing creativity by making a difference	14
No answer	12
To make the customer’s choice easy with a good design	10
Giving an idea to the consumer about the company with products, logos and packagings	8
Getting the competitive edge with difference	7
Customer satisfaction	6
Increasing revenue	3
Increasing demand	3
Increasing sales	1
Enabling consumers to choose	1

\* Multiple codes are obtained from the prospective teachers’ answers.

When Table 12 is examined, it is seen that the third-grade prospective science teachers mostly answers the related question as “*attract attention–arouse curiosity*” ( $f=61$ ) “*meaningless reply*” ( $f=53$ ). The answer of S27 to the 11<sup>th</sup> question in EAIF is as follows.



\* Tasarım görsel katkıya sahip eder ve insan dış görünüşünü sevmeyi ister.  
Vene bakmak isteriz.

**Figure 9.** The answer of S27 to the 11<sup>th</sup> question as attract attention–arouse curiosity

The results obtained from the last question about “What are the significant features while purchasing an active business? Discuss over an example.” are presented in Table 13.

**Table 13.** The results obtained from the 12<sup>th</sup> question in EAIF

Codes	f
Transportation –location	72
Income–expense ratio	50
Customer satisfaction	28
The reason why it is sold	25
The probability of development	17
The status of meeting expectations	15
The design of workplace	14
No answer	13

Meaningless reply	12
Being an environmentalist	7
Recognition	6
Suitability for the work	6
Having a different side from other businesses	6
Number of workers-properties-working system-fee	5
Equipment of the business (tools-equipment-hardware)	4
Legal obligations	4
Workforce –size	4
Size of the workplace	3
Challenges	3
The lease of the business	3
Cleaning	3
Objectives and goals	2
Health-safety measures	2
Competitor analysis	2
Socio-economic status of the business location	1
Should be technological	1
Change status of environmental reconstruction	1
Economic value of the product	1
Turnover	1
Market share	1

\* Multiple codes are obtained from the prospective teachers' answers.

When Table 13 is analyzed, it is pointed out that the third-grade prospective science teachers mention to observe "transportation-location" ( $f=72$ ) and "income-expense ratio" ( $f=50$ ) of the business while purchasing an active business in recent years. The answer of S50 to the last question in EAIF is as follows.

— Neden satıyor?  
 — Cevredeki insanların mekan ile ilgili düşünceleri.  
 — Bulunduğu konum işlek mi?  
 — Gelecekte nasıl işler, işlevi düşer mi?

**Figure 10.** The answer of S50 to the 12<sup>th</sup> question as "the reason why it is sold", "transportation – location", "the probability of development", "customer satisfaction"

The findings obtained from the data collection tool are tried to be interpreted in the discussion section.

#### 4. Discussion

It is vital that our prospective science teachers, who are future teachers, have this skill in order to make our students gain entrepreneurial skills, which is one of the life skills. It is necessary not only to make the secondary school students acquire entrepreneurial skills but also individually to meet our

economic needs, to pursue our dreams and to contribute to the economy of our country. From this point of view, it is aimed to reveal the understanding of the entrepreneurial skills of prospective science teachers.

There are a number of characteristics of entrepreneurial skills that we have or want to develop through education. These characteristics are the economic, social and cultural foundations of entrepreneurship (Gontareva et al., 2018; Krasniqi, 2018; Madgerova & Kyurova, 2019). Revealing the connection of entrepreneurship with these characteristics allows us to identify the needs and problems of the region we live in, to recognize and identify business opportunities more quickly (Espinoza, Mardones, Sáez & Catalán, 2019). We usually make an initiative on basic needs such as increasing our level of prosperity (Chen & Peng, 2017), meeting our needs economically (Saunoris & Sajny, 2017), providing job opportunities (Magaji, 2019; Shafiu, Manaf & Muslim, 2020), and as consequently, we contribute to economic development (Hamdan, 2019; Nissan, Martín, & Picazo, 2011; Urbano, Aparicio & Audretsch, 2019a). These inputs and outputs form the economic foundations of entrepreneurship (Nieto & Mateo, 2020; Urbano, Aparicio, & Audretsch, 2019b). A third of the candidates participating in the research explain the relationship between entrepreneurship and the economy with a few features and the majority gives meaningless answer (Table 2). This may be seen as an indication that their understanding of entrepreneurial skills is not sufficient. Social foundations of entrepreneurship includes increasing the level of prosperity in society (Alam, Shahriar, Said & Elahi, 2018; Yilmaz & Yilmaz, 2019) and the distribution of equal welfare among members of society (Cumming, Johan & Uzuegbunam, 2020). The reason why almost all of the third grade prospective science teachers do not emphasize these features (Table 3) may be due to their low understanding of entrepreneurial skills or having lack of theoretical knowledge about the relation between entrepreneurship and social factors. The characteristics such as cultural presuppositions, value and norm systems, and gender culture and family concepts are among the cultural foundations of entrepreneurship (Hechavarría et al., 2017; Aytac, 2006). The cultural structure of the society is one of the most important factors affecting business opportunities (Baser & Buber, 2012). The opportunities of culture serve as a leading function for entrepreneurship keep up with the trends such as appropriate behavior measures, autonomy, initiative, innovativeness, being pro-change, etc... Moreover, it can be said that the notion of cultural difference directly affects the openness or closeness to entrepreneurial identity/personality structures (Aytac, 2006). The emphasis the candidates lay on the majority of these characteristics (Table 4) may mean that they will define business ideas and opportunities by considering cultural foundations while making an initiative. The candidates who cannot explain the relation of entrepreneurship with economic and social factors, emphasizes its relation with cultural values, therefore it can be seen as an indication the prospective science teachers give due importance to cultural values.

The more different and original the solution you decide after revealing the needs of the community, the easier it is for the business you will establish to survive (Chaudhary, 2019; Saebi, Foss & Linder, 2019). This shows how creative thinking skill, which is another life skill, is both an effective skill on entrepreneurial skill (Kunicina, Bilic, Zabasta, Caiko & Ribickis, 2019) and another skill that we should acquire as an individual. An entrepreneur is a person who innovates (Roberts, Murray & Kim, 2015; Si, Ahlstrom, Wei & Cullen, 2020). Therefore, the role of creative thinking is very important for the use of this skill. This is because innovations attract attention (Prabhu, 2019), it provides customer potential (Liu, Hu, Zhang & Carrick, 2019) and increases its market share (Sergi, Popkova, Bogoviz & Ragulina, 2019). As a result, you gain economically. According to Guney (2015), the reason why 90% of the small and medium-sized enterprises which are opened in our country every year are closed within a year is due to the inability to carry out creative thinking and entrepreneurial skills together. When the answers about the impact of creative thinking on using entrepreneurial skills (Table 5) are examined, it is seen that very few

candidates emphasize the concept of innovation. It can be seen as a sign that candidates are insufficient to learn about the importance of creativity in the use of entrepreneurial skills on the basis of these results.

Utilizing technology affects entrepreneurship positively in terms of many factors. It is seen that the codes of these factors emerge from the responses of the candidates, but the frequency values of the resulting codes are very low. Utilizing technology while making an initiative means more added value for that country (Tutar, Altinkaynak & Terzi, 2017). It is noteworthy that there is no opinion on this issue. This can be seen as an indication that prospective science teachers have insufficient knowledge about the purposes for which they should use technology while making an initiative. It may also be due to the lack of any business ideas in their minds. The absence of a business idea can be considered as an indication that entrepreneurial tendencies are low.

The fact that the majority of third-grade prospective science teachers cannot explain how to act with nature in the process of starting up a business (Table 7) can be seen as one of the main results which show that their understanding of entrepreneurial skills is low. This is because, there are acquirements related to the environmental problems and solutions, the relationship between human and environment in the 5<sup>th</sup> grade "Human and Environment" section in the science curriculum in 2018. Environmental problems and solutions are discussed in the 8<sup>th</sup> grade "Energy Conversions and Environmental Science" section in a similar way. Furthermore, the acquirements like "F.8.6.4.2. *Designs projects for the efficient use of resources.*" (MEB, 2018) can also provide business ideas that can reveal entrepreneurial skills. Therefore, the majority of prospective science teachers may not be able to explain how they should act with nature in the process of starting a business due to their low understanding of this skill.

An entrepreneur must follow the basic steps of the process of starting a business upon making a new business decision. These steps can be listed as having motivation, developing a successful business idea, preparing a work program, making a preliminary assessment of the business idea, researching the feasibility of the business idea, preparing a business plan (Guney, 2015; Li, Qian, Chen & Zhang, 2019; Teasdale, Steiner & Roy, 2020). Few of the science teacher candidates emphasize these processes. In addition, one of the most important elements of a new business is a good management team (Boone, Lokshin, Guenter & Belderbos, 2019; Gauthier, Cohen & Meyer, 2019; Guney, 2015). It is seen that the candidates have never responded according to this code. Entrepreneurs are also expected to be realistic while starting a new business (Guney, 2015). This is because it is very difficult to participate in the market of that business idea in an environment where there is competition (Guney, 2015; Presutti & Odorici, 2019). It is significant that few of the candidates respond in the code for conducting a feasibility study of the business idea (Table 8). These results can be seen as an indication that prospective science teachers do not have knowledge of what processes they should plan carefully when they start a new business, and that they should learn about the basic steps of the process of starting a business when they want to become an entrepreneur.

The obstacles and incentives in the business you will establish upon making a business decision are affected by many variables. Family, culture, education, religion and economy and geography are the leading variables that affect entrepreneurship (Basar, 2017; Guney, 2015; Karadal, 2016; Molina, 2020; Poblete, Sena & De Arroyabe, 2019; Tutar, Altinkaynak & Terzi, 2017; Valliere, 2019). These variables affect the spirit of motivation and entrepreneurship that affect individuals' initiatives (Basar, 2017; Soomro, Shah & Mangi, 2019) may positively or negatively impact (Murnieks, Klotz & Shepherd, 2020). Half of the candidates see the lack of capital as the most prominent obstacle rather than such effects while making a business decision (Table 9). Lack of capital is an obstacle (Boudreaux & Nikolaev, 2018; Hidayat & Wibowo, 2019; Zana & Barnard, 2019) but has an overriding role compared to other variables. This is because KOSGEB, banks, ministries, TUBITAK, UNICEF, and ISKUR provide financial support for different business ideas in terms of capital. When the table 9 and 10 are examined, the fact that half of

the candidates give meaningless replies and no answers shows that they have no idea about the obstacles and incentives in the business they will set up. However, the fact that they see the basic variable required to undertake venture as capital, but they do not have enough knowledge at the point of obtaining capital can be considered as an indication that entrepreneurial tendencies of candidates may be negatively affected.

When the results related to the sections required in the business plans are examined (Table 11), it is seen that third-grade prospective science teachers do have no knowledge on designing a business plan since they do not answer about it. When Table 11 is analyzed, it is seen that the business plan sections on which the candidates mostly emphasize while answering the related question are business idea, the reason why to choose the business idea, market profile, the choice of location and its reason, access to the customer, product- service promotion plan, the qualification, duty and responsibilities of staff and financial planning. The business plan has an important role in sustaining and improving the business as it includes all the processes related the business you will initiate (Kahn & Baum, 2020; McKenzie & Sansone, 2019). Giving the responsibility to prepare business plans to someone else is not the right step to run the business successfully, but entrepreneurs can receive training or assistance from experts. When the answers are examined, it is seen that almost all the candidates do not have information on preparing a business plan. This can ultimately be seen as a situation that will negatively affect a candidate's tendency to initiate. The education variable is one of the most important factors affecting the upbringing of entrepreneurs and the culture of entrepreneurship (Ahmed, Rehman & Sergi, 2019; Doua, Zhu, Zhang & Wang, 2019; Guney, 2015; Nowiriski, Haddoud, Lancaric, Egerova & Czegledi, 2019; Lajqi, Shiroka-Pula & Krasniqi, 2019). If the candidate has the necessary motivation and entrepreneurial spirit, he may tend to design a business plan and initiate after some training.

While an initiative depends on product design, creative thinking and innovation, these three features are integrated (Vijayalakshmi, 2019). This is because the more different your product is from the other products, the more it attracts attention and provides you the opportunity to be superior in the competition process (Val, Gonzalez, Lauroba & Beitia, 2019). Increasing competition also increases the importance of design in products (Yu, Yuizono & Kim, 2019). Nearly half of the prospective science teachers do not either give meaningless replies or no answer. The others have explained the product design on its place in entrepreneurship within the framework of many codes (Table 12). According to these results, most of the prospective teachers do not have sufficient knowledge about product design while making an initiative and this may be due to the fact that they have not been trained on the subject in the educational processes until now. Therefore, it can be said that candidates need entrepreneurship training on the subject.

Third-grade prospective science teachers state most of the features that should be considered upon purchasing an active business. However, when the frequency values of the obtained codes are examined (Table 13), it is seen that the values of each code are low. It is seen that there is no response from the candidates on the status of the stocks and the tax debt of business sold. It is noteworthy that the candidates respond mostly according to the location of the business and the income and expenditure accounts. This situation can be seen as an indication that candidates' understanding of entrepreneurship skills is low.

## **5. Conclusion**

It is determined that candidates cannot explain the economic and social foundations of entrepreneurship within the scope of this study, in which the entrepreneurial understandings of third-grade prospective science teachers is tried to be revealed. However, when they will show tendency to entrepreneurship, it emerges that the majority of candidates will take into account the cultural values. Almost half of the candidates have not stated how important it is to be creative and product design in an

initiative. More than half of the candidates are found to have knowledge about the importance of using technology and how to act with nature while making an initiative. It turns out that a few of the candidates are aware of the need to perform a business idea, how to make a preliminary assessment of the business idea and feasibility study of how the business idea will act. While the majority of candidates can predict the obstacles they will face upon setting up a business, they are unaware of the incentives they can achieve. It is found out that nearly all of the prospective science teachers have no knowledge about the process and content of the work plan preparation process, which is the backbone of business starting process. It is revealed that the candidates mostly pay attention to the business idea and the selection of the workplace location in the process of setting up a business. If the candidates want to purchase an active business, they will be able to search for income status, customer satisfaction and the reason why the business is sold instead of business itself. When the results obtained from the entrepreneurship test in general are examined, it is found that the prospective science teachers' understanding of entrepreneurial skills is low.

## 6. Suggestions

The low understanding of the entrepreneurial skills of prospective science teachers may be due to the lack of education on this skill. Therefore, it may be suggested that candidates be subjected to an entrepreneurship training that will enable them to become successful entrepreneurs and provide added value to the country. Considering that a science teacher who does not possess the features for this skill cannot make secondary school students acquire this skill within the context of life skills, it can be suggested that the entrepreneurship and economics course, which is included as an elective course in the current science education undergraduate course content, is a compulsory course. However, it is recommended by other researchers to follow and examine the entrepreneurial understanding of prospective science teachers in all periods from their beginning of the program to their graduation. This is because, determining to what extent the competencies required by this skill are acquired at each stage and eliminating the deficiencies will directly affect the prospective teachers' potential for producing input to the economy by using science knowledge in the future both for them and their students. In addition, it will be beneficial to develop applications loaded with socio-scientific values in order to increase the future entrepreneurial awareness of prospective science teachers by other researchers.

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