

## Relationship between Middle School Students' Innovative Thinking Tendencies and Entrepreneurial Skills

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### ABSTRACT

This study aims to determine the relationship between middle school students' innovative thinking tendencies and entrepreneurial skills and to identify the variables that predict entrepreneurial skill. To this end, the study used the correlational survey method. The study group consists of 274 5th-, 6th-, and 7th-graders studying in 3 middle schools in the central district of Trabzon Province, Turkey, in the 2021-2022 academic year. The study data were collected using the "Innovative Thinking Tendency Scale for Middle School Students" (ITTSMSS) and the "Entrepreneurship Scale for Secondary School Students" (ESSSS). They were subjected to correlation and regression analyses via SPSS 22 statistical analysis program. Through the analysis, the study found a high relationship between middle school students' innovative self-efficacy and self-awareness. It was also determined that innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership predicted the middle school students' entrepreneurial skill levels at significant, positive, and moderate levels. Based on the results, it is recommended to create teaching content and organize teaching activities in which entrepreneurial skill and innovative thinking skill are covered together and aimed to be developed.

**Key words:** Middle School Students, Entrepreneurial Skill, Innovative Thinking Tendency

### INTRODUCTION

With their rising importance for countries, entrepreneurs have gradually become the focal point of many economies in the world (Zhou et al., 2021, p. 1). Increasing economic competition, especially as a result of the development and spread of information technologies, has raised the need for entrepreneurs (Akpınar, 2009, p. 13). For this reason, most countries have started to adopt an entrepreneurial culture in order to increase the number of entrepreneurs and to reveal the entrepreneurial potential of individuals. A rise in the number of entrepreneurs in a country is an indicator of economic development and social welfare. Therefore, the high number of entrepreneurs in a country means stability and hope for the future of that country (Onay & Çavuşoğlu, 2010). An entrepreneur is a person who buys and produces the inputs and services of production to sell for a price that has not yet been determined (Başar & Tosunoğlu, 2006, p.124). Therefore, entrepreneurs identify the needs in the society and turn them into investments. Entrepreneurs have a critical importance in increasing the welfare level of the countries with the investments made. Introducing the new resources and technologies that are used by entrepreneurs while making these investments to the economy has many economic

benefits such as providing new employment opportunities in the country and increasing its production (Dilsiz & Kölük, 2005; Ulucan, 2015). Entrepreneurs also have a substantial role in eliminating and reducing the regional development gap (Özkul & Dulupçu, 2007, p. 74). The more active the entrepreneurs in a city or region, the higher the quality of life of that region (Doğun, 2003, p. 8).

Entrepreneurs provide many benefits for countries, both economically and socially. Entrepreneurs, who are accepted as the pioneers of development and change, constitute the dynamics of the society. They have important duties in putting new resources and technological developments into practice and transforming them into products and services for the benefit of society (Akpınar, 2009, p. 16).

The most important benefit of entrepreneurship is that it gives the individual the opportunity to reveal their potential and to apply it to what they want to do (Başar, 2017, p. 39). This freedom makes them the driving force of the society (Akpınar, 2009, p. 17). Entrepreneurs have many benefits such as creating employment in the global and national context, strengthening inter-sectoral relations, helping to provide a balanced income distribution, and contributing to the country's promotion (Çelik, 2013; Sönmez & Toksoy, 2014). Considering the benefits that entrepreneurs provide

for countries, raising entrepreneurial individuals has become inevitable for countries. In this regard, in order to create an entrepreneurial culture, countries have aimed to identify the entrepreneurs they have and to raise individuals with these characteristics (İn, 2015, p.18). Previous research states that entrepreneurial individuals have some unique skills (Deveci, 2015, p. 18). It is indicated that entrepreneurs mostly have characteristics such as need for success, tendency to take risks, seeing opportunities, emotional intelligence, desire to work, courage, willingness to change, tendency to teamwork, tolerance to uncertainty, self-confidence, locus of control, and persuasiveness (Korkmaz, 2012; Pan & Akay, 2015; Deveci & Çepni, 2015). On the other hand, entrepreneurship is a meta-skill. Entrepreneurial individuals are expected to have 21<sup>st</sup> century skills such as financial literacy, communication, collaboration, problem solving, decision making, creative thinking, innovative thinking, critical thinking, flexibility and adaptability, self-management, leadership, social skills, productivity, and accountability (Partnership for 21<sup>st</sup> Century Skills, 2009; Milli Eğitim Bakanlığı, 2018). Entrepreneurship is basically a matter of innovative thinking. For this reason, innovative thinking is accepted as a critical element in today's economy (Fowlin et al., 2013, p. 324). In this context, the main duty of entrepreneurs is to think innovatively and to put their ideas into practice (Gökbulut-Özdemir, 2012, p. 7). Innovative thinking is defined by Fu (2019) as “the ability to use new knowledge and experience to open up new areas of thinking, that is, pursue the best and the latest knowledge in the field of thinking” (p. 2293). Aras (2009) defines innovative thinking as the process of breaking out of existing patterns, thinking differently from other people, and revealing new and realizable original thoughts (p. 9). Since the purpose of innovation is to develop, promote, and implement new products and ideas, it is closely related to economy (Binkley et al., 2010, p. 17). In the perspective of economy, innovation refers to the process of creating a business idea and transforming this idea into marketing, a new or improved manufacturing system and distribution method, or a new social service (Başar, 2017, p. 14). Thus, innovation is an indispensable element to create a business idea. Creating a business idea and putting it into practice is the job of entrepreneurs. Entrepreneurship is basically a matter of introducing an innovation. Hence, entrepreneurs have been seen as pioneers and implementers of innovation by many researchers (Veeraraghavan, 2009, p. 18). This function has brought the differentiation and change of the needs of countries and societies. This differentiation and change has also affected educational activities, as many fields. As a result, innovative thinking skill and entrepreneurial skill have been added as a component to educational activities.

While “entrepreneurship” and “innovative thinking/innovativeness” are taught as courses in some faculties at the higher education level in Turkey, such as faculties of education and faculties of economics and administrative sciences, it is given as an elective course at the secondary education level, though it is included as a competency in their curriculum. At the primary education level, entrepreneurship and

innovative thinking are not directly included in the curriculum as a course or subject but are covered as a skill with an interdisciplinary approach.

Entrepreneurship and innovative thinking are included as competences and skills in the curricula of social studies and science courses at the primary education level. Entrepreneurial skill has been included as a basic skill in all curricula that have been implemented since 2005. However, innovative thinking skill has taken its place in the curricula of the relevant courses as a skill and competence as of 2018.

Entrepreneurship and innovative thinking are included as basic skills in the Turkish Social Studies Curriculum. In this regard, there are achievements of these skills at different levels and in different learning areas from the 4<sup>th</sup> to the 7<sup>th</sup> grade. In the Science Curriculum, on the other hand, entrepreneurial skill is included in the special objectives as “to foster career awareness and entrepreneurial skills related to science”. It is also included as one of the “Life Skills”, one of the field-specific skills in the curriculum. In addition, under the title of “Science, Engineering, and Entrepreneurship Practices” in the curriculum, there are statements like “They are asked to create strategies and use promotional tools to market products in order to develop their entrepreneurial skills.”. In the Science Curriculum, innovative thinking skill is included within the scope of “Engineering and Design Skill”, one of the field-specific skills. In this regard, the skill is tried to be given to students at different grade levels with various achievements.

In the Social Studies Curriculum and the Science Curriculum, entrepreneurship is given as “taking initiative and entrepreneurship”, as one of the eight key competences determined in the Turkish Qualifications Framework. This competence is described in the curricula as follows: “It refers to an individual’s skill to put their ideas into action. It includes creativity, innovation, and risk taking, as well as the ability to plan and manage projects in order to achieve goals. This competence supports everyone not only at home and in society, but also in working life so that they can be aware of the contexts and conditions of their work and seize business opportunities, and it provides a basis for more original knowledge and skills needed by those who engage in or contribute to social and commercial activities. It also involves being aware of ethical values and supporting good governance.”

It is clear that the Social Studies Curriculum and the Science Curriculum take entrepreneurship and innovative thinking as a skill, while covering entrepreneurship also as a competence. In the curricula, both skills are tried to be taught/introduced through an interdisciplinary approach.

The literature suggests that innovative thinking is among the characteristics entrepreneurs should have (Korkmaz, 2012; Çetinkaya-Bozkurt & Alparslan, 2013; Edwards-Schachter et al., 2015; Pan & Akay, 2015; Yüksel et al., 2015; Çemrek & Girginer, 2017; Armut, 2018). Previous research also states that there is a relationship between individuals’ innovative thinking skills and entrepreneurial intentions, and that these elements are complementary to each other (Zhao, 2005; Alkan, 2014; Çetin & Taşdemir, 2017). Considering this relationship, analyzing the relationship between individuals’ innovative thinking tendencies and entrepreneurial

characteristics is very important in shaping the educational activities to be carried out in this direction. In this regard, this study aims to determine the relationship between entrepreneurial skills and innovative thinking tendencies of 5th-, 6th-, and 7th-grade middle school students. To this end, answers to the following questions are sought:

1. Is there a significant relationship between middle school students' entrepreneurial skills and innovative thinking tendencies?
2. What variables predict middle school students' entrepreneurial skills?

## METHOD

### Research Design

The study used the correlational survey model. Survey models are a research approach aimed at describing a situation that exists in the past or still, as it exists (Karasar, 1999). In this direction, first, Pearson's correlation coefficients were calculated to examine the relationships between the variables. Then, it was tried to determine whether the middle school students' entrepreneurial skills were predicted by the variable of innovative thinking (innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership). For this purpose, in order to predict the entrepreneurial skill levels of the students, multiple linear regression analysis was conducted with the variables of innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership, which are the sub-dimensions of the Innovative Thinking Tendency Scale for Middle School Students.

### Study Group

The study was conducted in the 2021-2022 academic year. The study group was selected through convenience sampling. The study group consists of 274 5th-, 6th-, and 7th-grade students studying in 3 middle schools in the central district of Trabzon Province, Turkey. The age range of the students in the study group was 10-13 years.

### Data Collection Tools

In the research, data were collected by using Innovative Thinking Tendency Scale for Middle School Students and Entrepreneurship Scale for Secondary School Students. Although the two scales are for students from the same level (middle school), the second scale name includes "secondary school" as a choice in the translation of the scale name into English by the developers of the scale. Both "middle school" and "secondary school" are used as translations of "ortaokul", meaning "middle school" in Turkish.

### *Innovative thinking tendency scale for middle school students*

The "Innovative Thinking Tendency Scale for Middle School Students" (ITTSMSS), developed by Deveci and

Kavak (2020), was used to determine students' innovative thinking tendencies. It is a 5-point Likert-type scale composed of 5 factors and 25 items. Its sub-dimensions are innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership. The exploratory factor analysis showed the factor loadings of the scale to range between .30 and .83. The factor loadings of factor 1 were in the range of .30-.79, those of factor 2 in the range of .62-.78, those of factor 3 in the range of .53-.83, those of factor 4 in the range of .65-.76, and those of factor 5 in the range of .69-.77.

The reliability calculation for the sub-dimensions yielded the results of .91 for factor 1, .81 for factor 2, .82 for factor 3, .70 for factor 4, and .62 for factor 5. The KMO value of the scale was .93, and the Bartlett's test result was 13469.38. The total Cronbach's alpha coefficient of the scale was found to be .91. The percentage of total variance explained by the scale was calculated as 54.5.

The reliability values of the scale were re-calculated for the present study. Through the analysis, the Cronbach's alpha coefficients of the sub-dimensions of the scale were determined as follows: .88 for factor 1, .87 for factor 2, .86 for factor 3, .75 for factor 4, and .76 for factor 5. The total Cronbach's alpha coefficient of the scale was found to be .94. Accordingly, it can be said that the scale is highly reliable.

### *Entrepreneurship scale for secondary school students*

To determine the students' entrepreneurship levels, the study employed the "Entrepreneurship Scale for Secondary School Students" (ESSSS), developed by Eroğlu et al. (2020). It is a 4-point Likert-type scale composed of 3 factors and 31 items. Its sub-dimensions are self-awareness, risk taking, and evaluating opportunities. The exploratory factor analysis showed the factor loadings of the scale to range between .42 and .79. The factor loadings of factor 1 were in the range of .45-.69, those of factor 2 in the range of .42-.79, and those of factor 3 in the range of .44-.64. The reliability calculation for the sub-dimensions yielded the results of .88 for self-awareness, .88 for risk taking, and .76 for evaluating opportunities. The KMO value of the scale was .890, and the Bartlett's test result was 4.395. The total Cronbach's alpha coefficient of the scale was found to be .90. The total variance explained by the scale was calculated as 32.54 percent.

The reliability values of the scale were re-calculated for the present study. Through the analysis, the Cronbach's alpha coefficients of the sub-dimensions of the scale were determined as follows: .89 for factor 1, .85 for factor 2, and .75 for factor 3. The total Cronbach's alpha coefficient of the scale was found to be .93. Thus, it can be said that the scale is highly reliable.

### *Demographic information form*

The demographic characteristics of the students in the study group are given in Table 1.

**Table 1.** Demographic characteristics of the study group

Demographic Characteristics		<i>f</i>	%
Gender	Female	125	45.6
	Male	149	54.4
Grade Level	5 <sup>th</sup> grade	89	32.5
	6 <sup>th</sup> grade	71	25.9
	7 <sup>th</sup> grade	114	41.6

### Data Analysis

First, the distribution of the data was examined. The analysis showed a normal distribution of the data. Thus, Pearson's correlation coefficient was calculated to determine the relationship between the variables.

Then, to predict the middle school students' entrepreneurial skills, multiple linear regression analysis was conducted with the sub-dimensions of ITTSMSS, i.e., innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership.

## RESULTS

### Descriptive Statistics and Correlations

Table 2 presents the arithmetic mean and standard deviation values for the sub-dimensions of ITTSMSS (innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, innovative group leadership) and the sub-dimensions of ESSSS (self-awareness, risk taking, evaluating opportunities).

As shown in Table 2, the mean values for the sub-dimensions of ITTSMSS were found as follows: innovative self-efficacy ( $M=3.85$ ), openness to innovation ( $M=3.79$ ), innovative problem solving ( $M=3.52$ ), innovative perseverance ( $M=3.52$ ), and innovative group leadership ( $M=3.2$ ). The mean values were above the midpoint (3) of the 5-point Likert-type scale. The mean values for the sub-dimensions of ESSSS were found as follows: self-awareness ( $M=3.09$ ), risk taking ( $M=3.84$ ), and evaluating opportunities ( $M=2.94$ ). The mean values were above the midpoint (2) of the 4-point Likert-type scale.

Pearson's correlation coefficients were calculated to examine the relationships of the variables with each other. Correlation values are given in Table 3.

When the correlation coefficients between the sub-dimensions of ITTSMSS (innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, innovative group leadership) and those of ESSSS (self-awareness, risk taking, evaluating opportunities) were examined, the highest relationship was seen to be between innovative self-efficacy and self-awareness, and it was a high, positive, and significant one ( $r=.72$ ;  $p<.01$ ). On the other hand, there were moderate, positive, and significant relationships between openness to innovation and self-awareness ( $r=.671$ ;  $p<.01$ ), between innovative problem solving and evaluating opportunities ( $r=.659$ ;  $p<.01$ ), and between innovative problem solving and self-awareness ( $r=.655$ ;  $p<.01$ ).

**Table 2.** Descriptive statistics

Variables	<i>M</i>	<i>SD</i>
1. Innovative self-efficacy	3.85	0.91
2. Openness to innovation	3.79	0.98
3. Innovative problem solving	3.52	1.03
4. Innovative perseverance	3.52	1.07
5. Innovative group leadership	3.21	1.12
6. Self-awareness	3.09	0.59
7. Risk taking	3.84	0.64
8. Evaluating opportunities	2.94	0.61

The weakest relationships were found between openness to innovation and risk taking ( $r=.453$ ;  $p<.01$ ), between innovative perseverance and risk taking ( $r=.457$ ;  $p<.01$ ), and between innovative group leadership and risk taking ( $r=.459$ ;  $p<.01$ ), which were moderate, positive, and significant ones. No negative relationships were found between the variables.

### Multiple Linear Regression Analysis

The study employed the SPSS 22 analysis program to determine how much the students' innovative thinking tendencies predicted their entrepreneurial skills. Multiple regression analysis was conducted to identify the extent to which the variables of innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership, as the sub-dimensions of ITTSMSS, explained the middle school students' entrepreneurial skills. In the regression analysis, while entrepreneurial skill was taken as the dependent variable, innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership, which were thought to have an effect on entrepreneurial skill, were taken as independent variables.

Based on the results in Table 4, significant relationships were detected between the students' entrepreneurial skills and the predictor variables of innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership ( $R=.799$ ;  $R^2=.64$ ) ( $F_{(5-268)}=94.78$   $P<0.05$ ).

The data indicated that innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership significantly predicted the students' entrepreneurial skills. The  $R^2$  value shows that 64% of the entrepreneurial skill ( $R^2=.64$ ) is predicted by these independent variables.

Based on the standardized regression coefficients, the order of importance of the predictor variables relative to entrepreneurial skill is as follows: innovative self-efficacy ( $\beta=.275$ ), innovative group leadership ( $\beta=.213$ ), innovative problem solving ( $\beta=.204$ ), openness to innovation ( $\beta=.171$ ), innovative perseverance ( $\beta=.121$ ). Hence, it can be said that students with innovative self-efficacy are more prone to entrepreneurship.

Significance tests of the regression coefficients indicate that the variables of innovative self-efficacy ( $p<.05$ ),

**Table 3.** Correlations

Variables	1	2	3	4	5	6	7	8
1. Innovative self-efficacy	1	0.711	0.706	0.577	0.446	0.72	0.482	0.654
2. Openness to innovation		1	0.704**	0.521**	0.414**	0.671**	0.453**	0.617**
3. Innovative problem solving			1	0.666**	0.435**	0.655**	0.519**	0.659
4. Innovative perseverance				1	0.459**	0.563**	0.457**	0.577**
5. Innovative group leadership					1	0.482**	0.459**	0.519
6. Self-awareness						1	0.606**	0.728
7. Risk taking							1	0.588
8. Evaluating opportunities								1

\*p&lt;.05; \*\*p&lt;.01

**Table 4.** Variables predicting entrepreneurial skill according to multiple linear regression analysis

Variable	B	Standard Error	$\beta$	t	p	Dual r	Partial r
(Constant)	1.08	0.092		11.779	0.000		
Innovative self-efficacy	0.162	0.035	0.275	4.676	0.000	0.705	0.275
Openness to innovation	0.094	0.031	0.171	2.986	0.003	0.662	0.179
Innovative problem solving	0.106	0.032	0.204	3.279	0.001	0.692	0.196
Innovative perseverance	0.06	0.026	0.121	2.346	0.02	0.603	0.142
Innovative group leadership	0.102	0.021	0.213	4.968	0.000	0.551	0.29

R=0.799 R<sup>2</sup>=0.639F<sub>(5-268)</sub> =94.78, p<0.05

openness to innovation (p<.05), innovative problem solving (p<.05), innovative group leadership (p<.05), and innovative perseverance (p<.05) are significant predictors of entrepreneurial skill.

The relationships between the predictor variables and entrepreneurial skill are as follows: a high, positive relationship between entrepreneurial skill and innovative self-efficacy ( $r=.705$ ) [ $(r=.275)$  when the effect of other variables is controlled], a moderate, positive relationship between entrepreneurial skill and innovative problem solving ( $r=.692$ ) [ $(r=.196)$  when the effect of other variables is controlled], a moderate, positive relationship between entrepreneurial skill and openness to innovation ( $r=.662$ ) [ $(r=.179)$  when the effect of other variables is controlled], a moderate, positive relationship between entrepreneurial skill and innovative perseverance ( $r=.603$ ) [ $(r=.142)$  when the effect of other variables is controlled], and a moderate, positive relationship between entrepreneurial skill and innovative group leadership ( $r=.551$ ) [ $(r=.29)$  when the effect of other variables is controlled].

## DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between the middle school students' innovative thinking tendencies and entrepreneurial skills. To this end, the sub-dimensions of ITTSMSS, i.e., innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership, were taken as predictor variables.

The middle school students were seen to have high mean values in the self-awareness and risk-taking sub-dimensions of ESSSS and a moderate one in its evaluating opportunities sub-dimension. In addition to its coverage as a skill in the Turkish Social Studies Curriculum and Science Curriculum (2018), entrepreneurship is also described as a competency. In the description of this competence in the curricula, it is stated that it involves the ability to plan and manage projects in order to achieve goals, besides the ability to transform one's ideas into action, creativity, innovation, and risk taking. In addition, it is noted that this competence supports everyone not only at home and in society, but also in working life so that they can be aware of the contexts and conditions of their work and seize business opportunities. According to Yurtseven (2020), entrepreneurship at the primary education level involves skills that can be developed in the school environment, such as having the desire to succeed, producing different ideas, taking risks in reaching goals, and being determined, rather than commercial entrepreneurship. The fact that the students were found to have high levels in the sub-dimensions of ESSSS also shows that the curriculum achieved its purpose on this matter. This result of the study is consistent with the results of Deveci (2018), aiming to determine the science-based entrepreneurial skills of middle school students. Deveci (2018) found the middle school students to have a high-risk taking tendency within the scope of the risk-taking sub-dimension of the science-based entrepreneurship scale for middle school students Toker (2022), investigating the entrepreneurial skills of secondary school students based on various variables, found the students' risk tendency average, as a sub-dimension of the

entrepreneurship potential inventory to be high according to each variable. In addition, Avcı Daş et al. (2022), examining the entrepreneurial skills of 8<sup>th</sup> grade students, found high averages for all variables in the risk-taking sub-dimension of the science-based entrepreneurship scale for secondary school students. This result of the study suggests that the students have the characteristics of risk taking, self-awareness and evaluating opportunities, which are among the characteristics of entrepreneurial individuals, that is, they have acquired these skills.

The students were also determined to have high averages in the sub-dimensions of ITTSMSS, that is innovative self-efficacy, openness to innovation, innovative problem solving, innovative perseverance, and innovative group leadership. The results obtained in the innovative problem-solving sub-dimension are similar to those of Aras (2020), who, aiming to determine middle school students' innovative thinking levels, found them to have high innovative thinking levels in the problem-solving sub-dimension. Gök (2021), who explored the reflections of science-based entrepreneurship education modules on students' innovative thinking tendencies, detected that the students achieved high mean scores in all sub-dimensions of the ITTSMSS in both pre- and post-test administrations of the scale. In Gedik's (2022) study, students expressed their desire to design new products. Having a desire to produce new ideas and products and design a product is a dimension of openness to innovation. In the present study, the students were seen to have a high average in the openness to innovation sub-dimension of ITTSMSS. Therefore, it can be stated that the results of the study are similar to those of Gedik (2022). The mean scores achieved by the students in the sub-dimensions of ITTSMSS suggest, in general, that the students participating in the study have the characteristics of innovative individuals, they are open to producing different ideas, their imagination is sufficient to innovate, they are curious, self-confident, and persevering. This also implies that the relevant curricula provide students with these characteristics to a considerable extent.

The correlation coefficients of the students indicated that the highest relationship was between the innovative self-efficacy sub-dimension of ITTSMSS and the self-awareness sub-dimension of ESSSS, and the relationships between the other sub-dimensions of the scales were moderate. Innovative self-efficacy, which is a sub-dimension of ITTSMSS, refers to having the competence and skill to make an innovation, having enough imagination to design something new, self-confidence in any situation. Self-awareness, which is a sub-dimension of ESSSS, includes characteristics such as motivating oneself to be successful, approaching new information with interest, loving imagining, having high self-confidence, and believing in oneself in decision making. The high level of relationship between innovative self-efficacy and self-awareness found based on the data obtained from the middle school students may result from that the two dimensions have similar characteristics that are complementary to each other.

Another result of the study is that the predictors of innovative self-efficacy, openness to innovation, innovative

problem solving, innovative perseverance, and innovative group leadership predicted the students' entrepreneurial skill levels at significant, positive, and moderate levels. Entrepreneurship is a multidimensional skill based on many features such as self-confidence, desire to be successful, problem solving, loving risk taking, evaluating opportunities, determination, creativity, innovation, perseverance, and leadership (Avcı, 2018; Yurtseven, 2020, Toker, 2022). Innovative self-efficacy comes first as a predictor of entrepreneurial skill level. This suggests that students with high innovative self-efficacy have higher entrepreneurial skill levels. Innovative self-efficacy refers to characteristics such as having sufficient knowledge and skills to innovate, defending one's ideas about innovations, having enough imagination to design something new, being motivated to come up with something new, and self-confidence in any situation (Deveci & Kavak, 2020). People with a high level of entrepreneurship generally have high achievement and high self-efficacy (Florian, Karri & Rossiter, 2007 cited in Yurtseven, 2020). This clearly reveals the relationship between innovative self-efficacy and entrepreneurial skill and also supports the results of the present study.

A leader is a person who has the knowledge, experience, and abilities that will be needed to gather a group of people around certain goals and to mobilize those people in order to achieve these goals (Bay & Akpınar, 2017). The study found that innovative group leadership comes second as a predictor of entrepreneurial skill level. Among the innovative group leadership characteristics are meeting with friends to produce new projects, being asked for ideas in group work, seeing oneself as a leader in the group of friends (Deveci & Kavak, 2020). Based on the literature review, Güven (2010) noted that entrepreneurial individuals hold characteristics such as leadership, participation in group work, persuading others, taking responsibility, etc. This supports the result of the study on this matter.

One of the sub-dimensions of ITTSMSS is openness to innovation. Openness to innovation can be described as producing new products and ideas, looking for new and useful ways of doing something, believing that innovations are beneficial, and welcoming innovation (Deveci & Kavak, 2020). The study found openness to innovation as another sub-dimension predicting entrepreneurship. The people who enable the world to develop and turn into a modern structure are seen to be individuals who research, question, think creatively, have self-confidence, curiosity, and a sense of discovery, act independently, and are open to innovations (Eroğlu & Deveci, 2021). This is an important point revealing the relationship between innovative thinking and entrepreneurship. In their study with social studies teachers aimed at introducing entrepreneurial skill to students in social studies lessons, Eroğlu and Deveci (2021) determined that teachers referred to openness to innovation and keeping up with innovations when describing entrepreneurial skill.

Problem solving is to bring different and new solutions to the rules learned through previous experiences in order to find a solution to a problem (Korkut, 2002). Innovation is one of the main features of entrepreneurship (Alkan, 2014),

and it also includes problem solving (Avcı, 2018). Innovative problem solving, one of the sub-dimensions of ITTSMSS, is characterized as enjoying problem solving, trying to find a solution to a problem, seeking different solutions to the problem, and struggling until the problem is solved (Deveci & Kavak, 2020). Based on the answers given by the middle school students, the study determined innovative problem solving as one of the predictors of entrepreneurial skill. Avcı (2018) states that many definitions of entrepreneurship in the literature mention similar things and that entrepreneurship is principally based on the concepts of problem solving and evaluating opportunities. Aras (2020), describing entrepreneurship as a social and cultural phenomenon, states that there are different entrepreneurial characteristics in societies with different socio-cultural features and that in studies conducted in Turkey, entrepreneurial characteristics are associated with risk taking, self-confidence, need for success, ability to solve problems easily, good communication, etc. Above statements in previous studies are consistent with the results of the present study. Entrepreneurship, in essence, aims to develop what exists in line with needs rather than making new inventions. The basis of this process is to be innovative, to discover, and to have self-confidence, as well as to be able to solve problems and produce solutions to problems, besides many other characteristics. This perspective shows the relationship between problem solving and entrepreneurship much more clearly.

The study found innovative perseverance, one of the sub-dimensions of ITTSMSS, as another predictor of the entrepreneurial skill levels of the middle school students. Innovative perseverance refers to being persistent and patient, not giving up when faced with any difficulties (Deveci & Kavak, 2020). In the study of Eroğlu and Deveci (2021) taking the opinions of teachers on the introduction of entrepreneurial skill in social studies lessons, the teachers indicated it as one of the most important characteristics of entrepreneurship: "...entrepreneurs are patient people who turn crises into opportunities". Börü (2006) also revealed that students expressed entrepreneurship with sentences about determination and perseverance, besides many other features. Likewise, Yurtseven (2020) notes that among the characteristics to be possessed by entrepreneurs are perseverance and determination.

Globalizing, changing, and developing world conditions increase the need for individuals who can solve problems, question, have self-confidence, have a leadership spirit, have developed self-awareness, are determined and open to innovation. Educational activities have a very important place in introducing these characteristics. For this reason, it is aimed to provide students with many skills through educational activities. Among these skills are innovative thinking and entrepreneurship. Although innovative thinking skill and entrepreneurial skill are two independent skills, the former is also seen as a component of the latter in the literature. In this regard, the study aimed to reveal the relationship between these two skills, depending on the literature. Based on the results obtained to this end, the following recommendations are made:

- The middle school students were determined to have high mean values in the self-awareness and risk-taking sub-dimensions of ESSSS and a moderate one in its evaluating opportunities sub-dimension. Thus, to improve middle school students' ability to evaluate opportunities, it is necessary to prepare teaching content and organize teaching activities accordingly.
- Moderate relationships were found between the sub-dimensions of entrepreneurial and innovative thinking skills. For this reason, to develop entrepreneurial and innovative thinking skills together, it is recommended to create teaching content and organize teaching activities that combine these two skills within the scope of relevant courses.
- This study was conducted using quantitative methodology. In order to obtain in-depth information on the subject, future studies can be conducted with mixed method or qualitative method.
- Within the scope of this study, innovative thinking and entrepreneurial skills were realized without making a distinction between social studies and science courses. Future studies can be conducted separately for social studies and science courses.

## REFERENCES

- Akpınar, S. (2009). *Girişimciliğin temel bilgileri [Basics of entrepreneurship]*. Umuttepe.
- Alkan, M. (2014). *Girişimcilerin girişimcilik, inovasyon yapma, inovatif düşünce ve inovatif girişimcilik düzeylerinin incelenmesi [Investigation of entrepreneurship, innovation, innovative thinking and innovative entrepreneurship levels of entrepreneurs]* [Unpublished master's thesis]. Hasan Kalyoncu University.
- Aras, B. (2020). *Investigation of secondary school student's innovative thinking levels in terms of various variables (Afyonkarahisar sampling)* [Unpublished master's thesis]. Afyon Kocatepe University.
- Armut, B. (2018). *Investigation of in terms various variabilities of entrepreneurship levels of social studies teacher candidates* [Unpublished master's thesis]. Amasya University.
- Avcı Daş, S. F., Ezberci Çevik, E. & Büyük, U. (2022). Investigation of entrepreneurship skill levels of 8<sup>th</sup> grade students. *Pearson Journal of Social Sciences & Humanities*, 7(21), 134-147. <https://doi.org/10.46872/pj.589>
- Avcı, Ö. (2018). *The effect of differential teaching applications on students' entrepreneurship skills and academic success* [Unpublished master's thesis]. Kırıkkale University.
- Başar, E. (2017). *Ortaöğretim girişimcilik ders kitabı [Secondary school entrepreneurship textbook]*. Sistem Ofset.
- Başar, M., & Tosunoğlu, B. T. (2006). Değer yaratımında iç girişimciliğin değişen boyutu: Bilgi girişimcilerinin rolü [Changing dimension of intrapreneurship in value creation: The role of knowledge entrepreneurs]. *Çanakkale Onsekiz Mart University Journal of Entrepreneurship and Development*, 1(1), 123-134.

- Bay, M., & Akpınar, S. (2017). Implementation on leadership styles and entrepreneurship features. *Journal of International Social Research*, 10(52), 964-923.
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., & Rumble, M. (2010). *Draft white paper 1: Defining 21<sup>st</sup> century skill*. [https://www.academia.edu/63101546/Draft\\_White\\_Paper\\_1\\_Defining\\_21st\\_Century\\_Skills](https://www.academia.edu/63101546/Draft_White_Paper_1_Defining_21st_Century_Skills).
- Börü, D. (2006). *Girişimcilik eğilimi: Marmara Üniversitesi işletme bölümü öğrencileri üzerine bir araştırma* [Entrepreneurship tendency: A research on Marmara University business department students]. Marmara University.
- Çelik, M. (2013). *The relationship between primary school principals' transformational leadership and entrepreneurship skills according to teachers' perceptions (The sample of Bağcılar ve Bakırköy districts)* [Unpublished master's thesis]. Sakarya University.
- Çemrek, F., & Girginer, N. (2017, July 25-27). *Entrepreneurship trends in university students: The case study of Eskişehir Osmangazi University* [Paper presentation]. Econ World, Paris, France. [https://paris2017.econworld.org/papers/Cemrek\\_Girginer\\_Enterpreneurship.pdf](https://paris2017.econworld.org/papers/Cemrek_Girginer_Enterpreneurship.pdf).
- Çetinkaya-Bozkurt, Ö., & Alparslan, A. M. (2013). Characteristics must be included entrepreneurs and entrepreneurship education: Opinions of entrepreneurs and students, *Journal of Entrepreneurship and Development*, 8(1), 7-28.
- Çetin, O., & Taşdemir, Ö. (2017). The impact of entrepreneurial capacity and personal innovativeness on entrepreneurial intention. *Social Sciences Research Journal*, 6(3), 76-87.
- Deveci, H. (2015). *Çocuklara girişimcilik kazandırmada sosyal bilgilerin rolü: Bir araştırma örneği* [The role of social studies in gaining entrepreneurship to children: A research example]. Pegem.
- Deveci, İ. & Kavak, S. (2020). Innovativeness perceptions and innovative thinking tendencies of middle school students: an exploratory sequential design. *Journal of Qualitative Research in Education*, 8(1), 346-378. <https://doi.org/10.14689/issn.2148-2624.1.8c.1s.15m>
- Deveci, İ. (2018). Investigation of science-based entrepreneurial tendencies of middle school students. *Journal of Science, Mathematics, Entrepreneurship and Technology Education*, 1(1), 19-47.
- Dilsiz, İ., & Köllük, N. (2005). *Meslek yüksek okulları için girişimcilik* [Entrepreneurship for vocational schools]. Detay
- Dolgun, U. (2003). *Girişimcilik* [Entrepreneurship]. Alfa
- Edwards-Schachter, M., García-Granero A., Sánchez-Barioluengo, M., Quesada-Pineda, H. & Amara, N. (2015). Disentangling competences: Interrelationships on creativity, innovation and entrepreneurship. *Thinking Skills and Creativity*, 16, 27-39.
- Eroğlu, S., & Deveci, H. (2021). Entrepreneurship levels of middle school students and teacher opinions about gaining entrepreneurship skills in social studies lesson. *Trakya Journal of Education*, 11(3), 1190-1211. <https://doi.org/10.24315/tred.784710>
- Eroğlu, S., Deveci, H. & Bayır, Ö. G. (2020). Development of entrepreneurship scale for secondary school students. *Cumhuriyet International Journal of Education*, 9(4), 1204-1224. <https://doi.org/10.30703/cije.696086>
- Fowlin, J., Amelink, C. & Scales, C. (2013). Educational affordances that support development of innovative thinking skills in large classes. *International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2013)*.
- Fu, Y. (2019). Training on innovative thinking ability in college English teaching under information technology environment. *3<sup>rd</sup> International Conference on Economics, Management Engineering and Education Technology (ICEMEEET 2019)*. <https://doi.org/10.25236/icemeeet.2019.457>
- Gedik, R. (2022). *Examination of innovative thinking skills of secondary school students* [Unpublished master's thesis]. Akdeniz University.
- Gök, S. B. (2021). *Reflections of the science-based enterprise training modules integrated with 5e learning cycle on the seven grade students' the innovative thinking tendencies*. (Unpublished master's thesis). Kahramanmaraş Sütçü İmam University.
- Gökbulut-Özdemir, Ö. (2012). Economic development and entrepreneurship: The role of innovative entrepreneurship on new value creation. *e-Journal of New World Sciences Academy NWSA-Social Sciences*, 7(1), 1-18.
- Güven, S. (2010). An analysis of life science course curricula from the perspective of the entrepreneurship characteristics. *Education Sciences*, 5(1), 49-57.
- İn, N. (2015). *Content analysis of entrepreneurship skills in the 4<sup>th</sup> and 5<sup>th</sup> grade social sciences coursebooks written between 1968 and 2012* [Unpublished master's thesis]. Gazi University.
- Karasar, N. (1999). Bilimsel araştırma yöntemi. [Scientific Research Methods]. Nobel
- Korkmaz, O. (2012). A research on determining the entrepreneurial inclination of university students: Bülent Ecevit University example. *Afyon Kocatepe University Journal of Economics and Administrative Sciences*, 16(2), 209-226.
- Korkut, F. (2002). Problem solving skills of high school students. *Hacettepe University Journal of Education*, 23(23), 177-184.
- Millî Eğitim Bakanlığı. (2018). *Sosyal bilgiler Dersi Öğretim Programı (İlkokul ve ortaokul 4, 5, 6 ve 7. sınıflar)* [Social Studies Curriculum (Primary and secondary school 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> grades)]. On September 30 retrieved from <https://ttkb.meb.gov.tr>.
- Onay, M. & Çavuşoğlu, S. (2010). Factors effecting entrepreneurship qualities in companies: Entrepreneurship. *Journal of Management and Economics*, 17(1), 47-67.
- Özkul, G., & Dulupçu, M. A. (2007). The effect of personal development onto entrepreneur types: An investigation in Antalya-Isparta provinces. *Çanakkale Onsekiz Mart University Journal of Entrepreneurship and Development*, 2(2), 67-92.



- Pan, V. L., & Akay, C. (2015). Examining teacher candidates' entrepreneurship levels in terms of various variables. *NWSA Education Sciences, 10*(2), 125-138.
- Partnership For 21<sup>st</sup> Century Skills, (P21). (2009). *Framework for 21<sup>st</sup> century learning*. On October 4 retrieved from <https://files.eric.ed.gov/fulltext/ED519462.pdf>
- Sönmez, A., & Toksoy, A. (2014). Entrepreneurship in Turkey and an analysis on Turkish entrepreneur profile. *Journal of Management and Economics, 21*(2), 41-58.
- Toker, H. (2022). *Examination of entrepreneurship abilities of high school students in terms of some variables*. (Unpublished master's thesis), Bozok University.
- Ulucan, S. (2015). *Analysis of entrepreneurial tendency and the factors affecting entrepreneurial tendency: Research on 3<sup>rd</sup> and 4<sup>th</sup> class high school students at secondary education* [Unpublished master's thesis]. Gazi University.
- Veeraraghavan, V. (2009). Entrepreneurship and innovation. *Asia-Pacific Business Review, 5*(1), 14-20.
- Yüksel, H., Cevher, E., & Yüksel, M. (2015). A research on the inclinations of entrepreneurship and entrepreneurship personality characteristics of students. *Çankırı Karatekin University Journal of the Faculty of Economics and Administrative Sciences, 5*(1), 143-156.
- Yurtseven, R. (2020). Entrepreneurship education in primary school: Purpose, content and teaching process. *International Journal of Science and Education, 3*(2), 135-153. <https://doi.org/10.47477/ubed.836675>
- Zhou, Y., Li, H., & Shahzad, F. (2021). Does college education promote entrepreneurship education in China? *SAGE, 11*(3), 1-10. <https://doi.org/10.1177/21582440211031616>