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Developing an Entrepreneurship Scale for 5th Grade Students

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Abstract: The aim of this study is to develop an Entrepreneurship Scale to measure the entrepreneurial skills of 5th grade students and to conduct the reliability and validity of the scale. This research is a descriptive survey method. The pilot application was made with 432 students in Amasya City in Turkey. SPSS 23 and LISREL 8.80 programs were used to analyze the data. Exploratory and confirmatory factor analysis was performed to construct the validity. As a result of exploratory factor analysis, a 4-factor structure emerged on the scale. Confirmatory factor analysis confirmed the structure, and it was determined that the developed model was in compliance with the criteria in the literature. These sub-factors were identified as meaningful in terms of self-confidence, need for success, personal benefit and leadership and responsibility. The Cronbach Alpha internal consistency coefficient of the scale was determined as 0.77. At the end of the research, a reliable and valid measurement scale about entrepreneurship was developed for the 5th grade students.

Keywords: *Entrepreneurship, entrepreneurship scale, developing scale, 5th grade students.*

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Introduction

The rapid changes in science and technology, the changing needs of society and the individual expectancy differentiate the skills of the individuals. Entrepreneurship, written and verbal communication, adaptation to change, problem solving, access to information and analysis and critical thinking skills are expressed as the skills of the 21st century (Wagner, 2008). One of these skills in education has been the entrepreneurship skill in recent years (Deveci, 2018). If students in schools can be trained as an entrepreneur individual, these students can cope with future educational problems (Yalcin, 2018). One of the most important goals of education is to provide students with the knowledge and skills they have learned in schools. Trilling and Fadel (2009) stated that this case will be seen as a big problem when the students do not use the skills in their life that they acquired at school. According to Hynes and Richardson (2007), they emphasized that the student who has an entrepreneurial feature should be able to test his academic knowledge in the real world and to switch from classroom learning to experiential learning. Therefore, the fact that the students have entrepreneurial skills that make it easier to transfer the information has been one of the important features requested from the students in recent years.

Entrepreneurship is a process where opportunities are evaluated (Dundar & Agca, 2007). An entrepreneur is an individual who can self-manage, manage goals and time well, work independently or in a team and use lifelong learning (Kylonen, 2012; Trilling & Fadel, 2009). According to Ince et al. (2015), the characteristics of an entrepreneurial individual include self-confidence, tolerance to uncertainty, innovation, the need to achieve success and taking risks. According to Mueller and Thomas (2001), an individual with entrepreneurial skill is open to innovation, creative and locus of control. It is necessary for students to get an education on entrepreneurship to improve their self-confidence and need to success (Lebusa, 2011). It is claimed that there has been a positive relationship between entrepreneurship and self-confidence (Jones & English, 2004). In the basis of entrepreneurship lies self-confidence (Heckman, Jora Stixrud, & Urzua, 2006). Asoni (2011) stated that self-confidence has control the cognitive skills on entrepreneurship. With the help of entrepreneurship education, the self-confidence of the students improves, and they can take responsibility at any case they encounter during their life (Vallaster, Kraus, Kailer, Baldwin, & 2019). The other important concept for entrepreneurship is personal benefit. An individual with entrepreneurship features should benefit from the opportunities that he encounters and provides personal benefit for himself (Kaygin & Guven, 2013). In such a way, that person can become a leader both for himself and for the society that he lives in. In other words, entrepreneurship leaders knows themselves and the society that they live in quiet well and find new opportunities for the society that creates new values (Esmer & Dayi, 2017). There are two basic approaches to learn how to be

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entrepreneurs. One of them is learning by doing from the experiences in real life (Politis, 2005), and the other is teaching forms derived from the classroom debate (Chang & Rieple, 2013). Therefore, entrepreneurship is one of the important features that should be taught and taught rather than genes from the family (Henry, Hill, & Leitch, 2005).

There have seen some researches in the literature about developing an entrepreneurship scale at secondary school level. Deveci (2018), has given an entrepreneurship scale which he developed by himself to 966 secondary school students. At the end of the data analysis, this entrepreneurship scale has consisted of four dimensions such as "taking risk", "need of success", "team work" and, "effective communication". Ilhan and Cetin (2013) developed a risk focused entrepreneurship scale for secondary school students consisting the dimensions such as '' prefer hard tasks'', ''negative trend after failure'' and, ''healing trend after failure''. In the entrepreneurship scale that Ince, Erdem, Deniz and Baglar (2015) developed, they determined the entrepreneurship skills of the university students. The sub-factors of this scale are ''technical skills'', ''administrative skills'', and ''personal skills''. Yalcin-Incik and Uzun (2017) developed an "entrepreneurship perception scale" to determine entrepreneurship skills of the university students. The sub-factors of this scale are ''planning'', ''focus of control'', "self- confidence", "communication", "motivation", and "self-discipline". When the literature investigated, there are many scales developed to measure the entrepreneurship skills of the university students. Thus, it was needed to develop new scales to determine the entrepreneurship skills and to develop these skills at the age 11-12 in which the personality of an individual occurs.

Entrepreneurship skills are included among the life skills that should be given to students in the Science Education Curriculum (MoE, 2018a), Mathematics Course Curriculum (MoE, 2018c), and Turkish Language Teaching Curriculum (MoE, 2018b). Especially in the Science Education Curriculum "In the scope of Science, Engineering and Entrepreneurship Practices, students are expected to define a need or problem from the daily life related to the subjects discussed in the units and this problem is intended to be used to develop the tools, objects or systems that are used or encountered in daily life" (MoE, 2018a). In this context, acquired entrepreneurship skills have been associated with the achievements of each unit in the Science Teaching Program. Furthermore, ''Science, Engineering and Entrepreneurship practices '' was added into the curriculum 9 hours for 4th grade and 12 hours for 5, 6, 7, and 8th grades. Therefore, it is necessary for teachers to prepare learning-teaching environments that develop entrepreneurship skills in students and to have a supportive attitude to support these skills in school (Eraslan, 2011). It is important to ensure that students acquire attitudes, knowledge and skills related to entrepreneurship at an early age (Bartulovic & Novosel, 2014). Especially, it is stated that 11-12 age periods are a critical period for students to gain entrepreneurship skills (Hassi, 2016). It is possible that these characteristics can be increased in many areas in following years by increasing the number of students (Obschonka, Silbereisen, Schmitt-Rodermund, & Stuetzer, 2011). In this context, there is a need for a valid and reliable measurement tool in determining the entrepreneurial characteristics of 5th grade students who are in the 11-12 age groups. Science course is an important subject in the curriculum for the secondary school students to motivate their entrepreneurship skills (Bartulovic & Novosel, 2014; Ezeudu, Ofoegbu, & Anyaegbunnam, 2013). When the literature about entrepreneurship was searched, there have been seen some positive proofs about the benefits of entrepreneurship on students, but there has not been seen a scale to determine the entrepreneurship skills of them. It can be said that better valid and reliable evaluations can be performed to determine the entrepreneurship skills of the secondary school students with the measurement tools developed. When literature investigated, although there have met some evidence that entrepreneurship education have some positive effects on secondary school students, there has seen no concrete measurement scale about poly-dimensional entrepreneurship scale for 5th grade students at the age of 11-12 which determine their entrepreneurship skills. This research is aimed to eliminate the lack in literature. Thus, this research is important. The aim of this study is to develop the Entrepreneurship Scale to measure the entrepreneurial skills of 5th grade students and to conduct the reliability and validity of the scale.

Methodology

This study is a scale development study. This section contains information about the research model, sample group, development and analysis stages of the entrepreneurship scale.

Research Model

This research was conducted with a descriptive survey model. In the descriptive survey model, it is aimed to reveal the current situation about the subject and the individual that becomes the subject of the research (Karasar, 2006).

Sample

The pre-pilot application of the scale was carried out with 16 students in 5th grade in a secondary school in Amasya. Total 432 5th grade students participated in the research. The necessary number for the validity of any research is at least 384 for the sampling size (Sekeran, 1992). Maximum variety sampling method was used to determine the sample of the research. The purpose here is to involve as many schools as possible into the research to provide the maximum variety (Yildirim & Simsek, 2013). Thus, the schools are categorized in three groups such as schools in the city center, towns, and villages. The location of the schools and the number of the students are given in Table 1.

Table 1. The location of the schools and student numbers

School Code	City Center / Town / Village	Students Numbers
A	City Center	82
B	City Center	78
C	Town	84
D	Town	96
E	Village	92
Total		**432**

Development Process of Data Collection Tool

Before the development of the Entrepreneurship Scale, related literature was reviewed. As a result of the literature review, researches about entrepreneurship were examined, and a number of studies were used in the preparation of the scale items (Ates, 2013; Bilge & Bal, 2012; Deveci, 2018; Ezeudu, Ofoegbu, & Anyaegbunnam, 2013; Hassi, 2016; Karakoyun, 2011; Obschonka et al., 2011; Pamuk, 2013; Wagner, 2008; Yalcin, 2018; Yilmaz & Sunbul, 2009; Zengin, 2008). These studies about entrepreneurship were investigated in detail. No item was used in its original form as these researches were carried on at different grade levels. The scale items in these researches were examined to get some knowledge. How the statements about entrepreneurship used were examined. No items were used as in its origin, but the mentioned research was used as reference. With the literature review, the items in the scale were prepared according to the characteristics that should be found in entrepreneurial individuals. Necessary materials were prepared considering the levels of the students in the sample. The items in the scale have always been prepared as a 3-point grading scale which are always, sometimes, and never. At first, pre-pilot application was made at 5th grade students in 16 secondary schools. With this application, the students' comprehension to the scale, the spelling and spelling errors were determined, and the deficiencies required during the application were noted. After the pre-pilot application, the main pilot application was started. For this application, 438 students developed a draft scale form. After the pilot application, 6 students were found to have incomplete coding. As a result, the responses of 432 students to the draft scale form were evaluated.

Validity and reliability studies of the scale were performed after the pilot application. Content validity and construction validity were examined for validity. For the validity of the content, expert opinion was consulted, and exploratory factor analysis was carried out to construct validity and then confirmatory factor analysis was performed. After the validity studies, the reliability of the scale was examined. In order to determine the reliability of the scale, Cronbach Alpha reliability coefficient was calculated.

Data Analysis

In the analysis of the data, SPSS 23 program was used for exploratory factor analysis and LISREL 8.80 program for confirmatory factor analysis. The positive items in the scale were scored as “never” 1, “sometimes” 2, and “always” 3. The negative items were scored as “always” 1, “sometimes” 2 and “never” 3. 14 items in the scale were scored as reverse.

For factor analysis, it is stated that 50 is very weak, 100 is weak, 200 is medium, 300 is good and 500 is very good for factor size (Cokluk, Sekercioglu, & Buyukozturk, 2012). Therefore, it is seen that the sample volume is large enough for factor analysis. The scale developed after data analysis is included in Appendix 1 and Appendix 2.

The results of the analysis that the skewness value was 0,14 and the kurtosis value was -0,749 were determined as a result. The fact that the skewness and kurtosis values are close to 0 between +1 and -1 can be shown as evidence that the data show normal distribution (Tabachnick & Fidell, 2013). In this context, it has been found that the data are normally distributed as a result of the analysis carried out. Descriptive statistics values about the scale are given in Table 2.

Table 2. The descriptive statistics values of the scale items

Item No	N	Minimum	Maximum	Sum	Mean	Std. Deviation
1	432	1,00	3,00	1075,00	2,4884	0,66385
2	432	1,00	3,00	984,00	2,2778	0,78066
3	432	1,00	3,00	1080,00	2,5000	0,69469
4	432	1,00	4,00	1085,00	2,5116	0,71436
5	432	1,00	3,00	1066,00	2,4676	0,74862
6	432	1,00	3,00	957,00	2,2153	0,80454
7	432	1,00	3,00	981,00	2,2708	0,79633
8	432	1,00	3,00	1078,00	2,4954	0,72090
9	432	,00	3,00	877,00	2,0301	0,83792
10	432	1,00	3,00	989,00	2,2894	0,78977
11	432	1,00	3,00	878,00	2,0324	0,82528
12	432	1,00	3,00	850,00	1,9676	0,77601
13	432	1,00	3,00	940,00	2,1759	0,81834
14	432	1,00	3,00	982,00	2,2731	0,77335
15	432	1,00	3,00	899,00	2,0810	0,81768
16	432	1,00	3,00	920,00	2,1296	0,81849
17	432	1,00	3,00	734,00	1,6991	0,79277
18	432	1,00	3,00	978,00	2,2639	0,79721
19	432	1,00	3,00	977,00	2,2616	0,79067
20	432	1,00	3,00	1016,00	2,3519	0,76240
21	432	1,00	3,00	1054,00	2,4398	0,73120
22	432	1,00	3,00	967,00	2,2384	0,78330
23	432	1,00	3,00	956,00	2,2130	0,78028
24	432	1,00	3,00	880,00	2,0370	0,76980
25	432	1,00	3,00	975,00	2,2569	0,81243
26	432	1,00	3,00	1004,00	2,3241	0,82960
27	432	1,00	3,00	922,00	2,1343	0,79764
28	432	1,00	3,00	936,00	2,1667	0,81460
29	432	1,00	3,00	973,00	2,2523	0,80816
30	432	1,00	3,00	919,00	2,1273	0,82027
31	432	1,00	3,00	900,00	2,0833	0,83291
32	432	1,00	3,00	720,00	1,6667	0,81460
33	432	1,00	3,00	758,00	1,7546	0,73049

Findings

In this section, findings of validity and reliability studies related to 'Entrepreneurship Scale' developed for 5th grade students in secondary school are included.

Validity Studies

For the validity studies of the scale, the validity of the content was examined at the first step. For the content validity, the expert opinion has been taken. For the construction validity of the scale, exploratory factor analysis and confirmatory factor analysis were performed.

Content Validity

To determine whether the prepared scale items cover the relevant subject, one faculty member of the educational sciences, and two science education scientists/experts have been consulted. In addition, to make the scale more understandable, one Turkish teacher's opinion has been taken. After the validity of the content, it was stated that the question roots of twelve items should be reviewed again and two items should be changed completely as a result of expert opinion. After the necessary changes made in the items of the scale, total 33 items were prepared to construct the validity.

Construction Validity

To determine the validity construction of the entrepreneurship scale, the suitability of the data set for factor analysis was determined. Kaiser-Meyer-Olkin (KMO) Sample Proficiency Test and Bartlett Sphericity Test results were examined. KMO value after analysis was found as 0,877. The result of Bartlett Sphericity Test was significant (χ^2 = 10939,486; p <0,01). When KMO was found to be higher than 0,60 (856), and the Bartlett test wass meaningful, this data shows that factor analysis can be done (Comrey & Lee, 2013). KMO value is recommended to be risen to 0,80

(Cokluk, Sekercioglu, & Buyukozturk, 2012; Durmus, Yurtkoru, & Cinko, 2011; Sencan, 2005). According to these results, a prerequisite to determine the validity of the scale was provided.

Exploratory Factor Analysis

Exploratory factor analysis was performed to find the factor considering the relationships between the variables (Buyukozturk, 2014). Varimax approach was used for exploratory factor analysis. Varimax (vertical rotation) approach is recommended in the development of a measurement tool that covers the most data with less substance in scale development studies (Can, 2014). In factor analysis, the factors with an initial eigenvalue 1 and greater than 1 are considered as important factors (Cokluk, Sekercioglu, & Buyukozturk, 2012). Accordingly, factor structures and explained variance values of Entrepreneurship Scale are given in Table 3.

Table 3. Factor structures of entrepreneurship scale and explained total variance

	Initial Eigenvalues		
Component	**Total**	**Explained Variance %**	**Cumulative %**
Factor 1	7,075	21,441	21,441
Factor 2	6,386	19,351	40,792
Factor 3	4,248	12,874	53,666
Factor 4	3,079	9,330	62,996
Factor 5	1,087	3,293	66,289

When Table 3 examined, it is seen that scale items are greater than 1, and initial eigenvalues are grouped in five factors. The cumulative variance that five factors explain is 66,289 %. Rotated Component Matrix results are presented in Table 3, which makes it easier to explain the substances contained in the factors mentioned in Table 4.

Table 4. Rotated component matrix' results of factor analysis of entrepreneurship scale

	Factors				
Scale Items	**1. Factor**	**2. Factor**	**3. Factor**	**4. Factor**	**5. Factor**
M1	**0,834**				-0,149
M4	**0,793**				
M3	**0,781**				-0,195
M5	**0,774**				
M21	**0,762**				
M10	**0,737**				
M20	**0,735**				
M8	**0,722**				
M14	**0,712**				0,193
M31	**0,664**	-0,129			**0,489***
M28	**0,642**	-0,124	-0,116		**0,469***
M30		**0,864**			
M16		**0,863**			
M26		**0,821**			-0,293
M25		**0,819**			-0,222
M13		**0,816**			
M12		**0,744**	-0,166	-0,114	0,150
M11		**0,739**	-0,143		
M9		**0,735**	-0,135		
M32	-0,240	**-0,520**	0,298		**0,419***
M7			**0,870**		
M19		-0,116	**0,866**		
M6		-0,119	**0,863**		
M22		-0,126	**0,847**		
M18			**0,842**	0,100	
M23		-0,144	**0,841**		
M29			**0,814**		
M24				**0,801**	
M27				**0,799**	-0,232
M2	0,141	0,133	0,149	**0,779**	-0,225
M33		-0,160		**0,726**	0,316
M15			0,179	**0,695**	
M17		-0,268		**0,684**	0,293

**High value substances in two different factors (Binary items)*

When Table 4 is examined, it is determined that what items of the scale gathered under which factors. Accordingly, items 28, 31 and 32 were found to have a high value more than one factor. The factor of the items was minimized and the item 32 (0,520-0,419) was eliminated from the scale. When the results of repetitive factor rotation were examined, it was determined that item 31 had a higher value than two factors. Furthermore, factor analysis was performed by eliminating the 31th item from the scale. After the factor analysis, it was not found that any substance had a higher value than two factors. Factor structures and the explained variance values of the factor analysis as a result of re-analysis of two items are given in Table 5.

Table 5. Factor structures of entrepreneurship scale as a result of item removal and explained total variance

Component	Initial Eigenvalues		
	Total	Explained Variance %	Cumulative %
Factor 1	6,746	21,761	21,761
Factor 2	5,886	18,986	40,747
Factor 3	4,181	13,486	54,233
Factor 4	3,070	9,904	64,138

According to Table 5, it was determined that the scale was reduced to four factors as a result of the elimination of the item. Another method that can determine the relationship between items and determine the number of factors is the slope accumulation graph (Cokluk, Sekercioglu, & Buyukozturk, 2012). According to this graph, the gap between two points is a factor. Figure 1 shows the slope deposition graph after elimination.

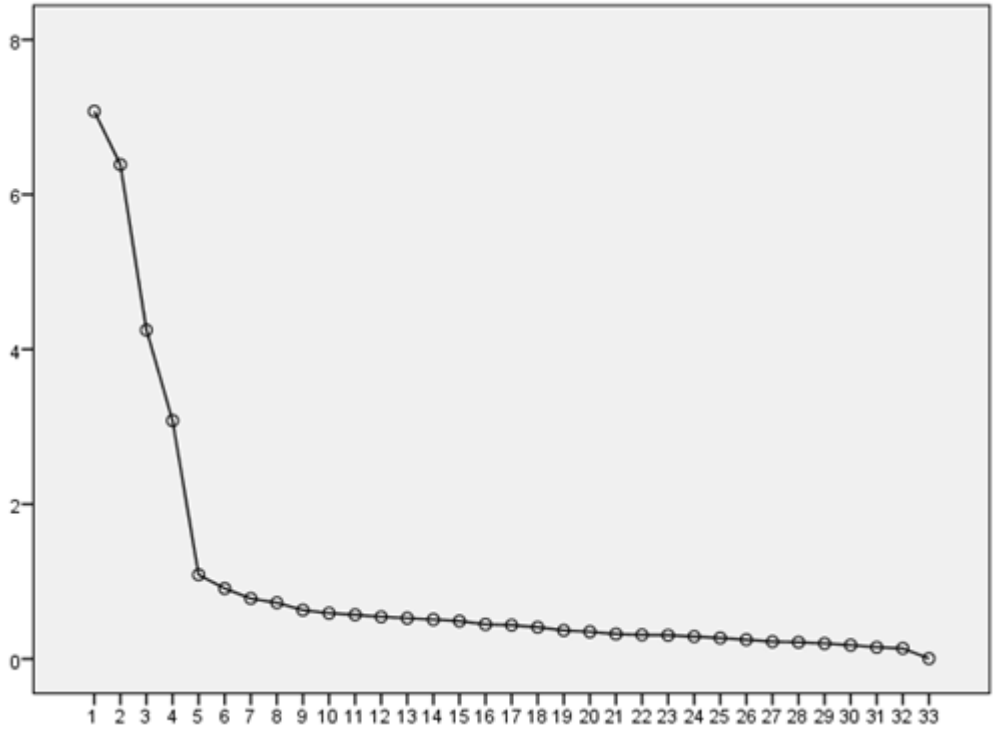

Figure 1. Scree plot of the factor number of entrepreneurship scale

When Figure 1 is examined, after the 5th point, the slope depicts parallelism and it becomes plateau. The contributions of the factors after that point to the variance are both small and similar. In the final case, the number of factors is decided as four. Factor rotation results after substance elimination are presented in Table 6.

Table 6. 'Rotated component matrix' results of factor analysis of entrepreneurship scale as a result of item removal

Scale Items	Factors			
	1. Factor	2. Factor	3. Factor	4. Factor
M1	**0,836**			
M4	**0,796**			
M3	**0,782**			
M5	**0,773**			
M21	**0,764**			
M20	**0,745**			
M10	**0,742**			
M8	**0,725**			
M14	**0,712**	-0,124		
M28	**0,643**	-0,188	-0,133	
M30		**0,860**		
M16		**0,860**		
M26		**0,853**		
M25		**0,843**		
M13		**0,820**		
M11		**0,726**	-0,151	
M9		**0,720**	-0,143	
M12		**0,716**	-0,177	-0,118
M19		-0,106	**0,870**	
M7			**0,869**	
M6		-0,124	**0,861**	
M22		-0,123	**0,846**	
M23		-0,139	**0,842**	
M18			**0,841**	0,101
M29			**0,815**	
M24				**0,803**
M27				**0,800**
M2	0,137	0,163	0,161	**0,778**
M33		-0,195		**0,727**
M15			0,176	**0,694**
M17		-0,303		**0,685**

These factors are named considering the aims of the items under each factor and examining the literature on entrepreneurship. Related to these aims, four factors are named as Self-Trust (1, 3, 4, 5, 8, 10, 14, 20, 21, 28), Leadership and Responsibility (2, 15, 17, 24, 27, 33), Personal Benefit (6, 7, 18, 19, 22, 23, 29) and Need for Success (9, 11, 12, 13, 16, 25, 26, 30).

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was performed to evaluate and check the validity construction of the factor structure after the exploratory factor analysis (Kline, 2005). The t values were checked first in confirmatory factor analysis. If t value exceeds 1,96, it is significant at 0,05 level (Cokluk, Sekercioglu, & Buyukozturk, 2012). Then, the factors and the t values of the items due to this are presented in Figure 2.

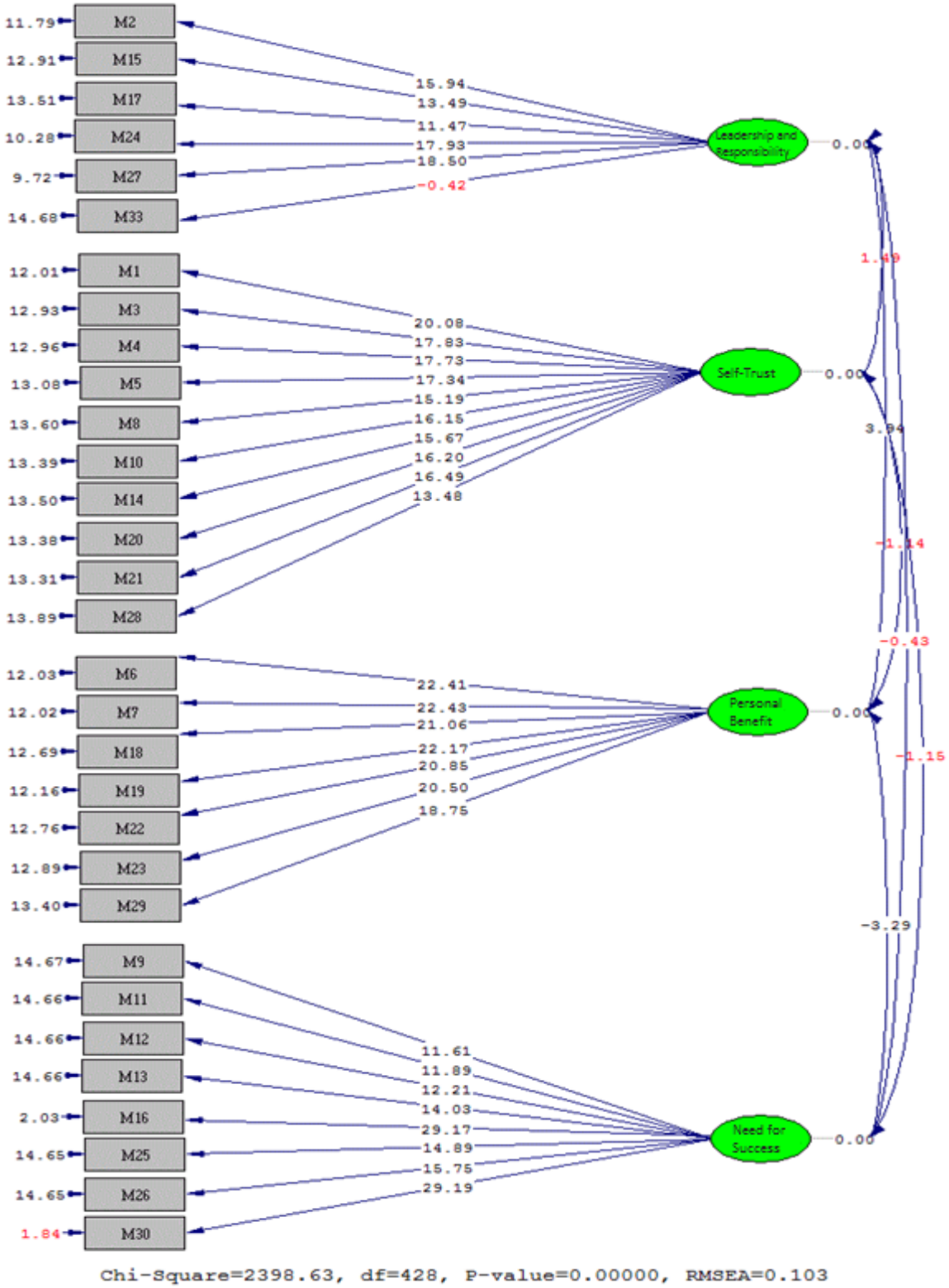

Figure 2. Path graph of the confirmatory factory analysis of the observed variables' levels of explanation ratios of hidden variables for four factor model of entrepreneurship scale

When Figure 2 was examined, it was determined that the values of 30 (1,84) and 33 (-0,42) items did not exceed 0,05 because they did not exceed 1,96. These items must be eliminated from the scale. First, 33 items with a lower t value were eliminated from the scale and re-confirmatory factor analysis was performed. However, it was observed that item 30 had a t value below 1,96. Therefore, item 30 was re-passed from the scale and confirmatory factor analysis was repeated.

Furthermore, the ratio of Chi-Square (Chi-Square Fit Test) value to df (degrees of freedom) was determined as 5,60. If this ratio is under 3, it means a perfect compliance. If it is lower than 5, it corresponds to moderate compliance (Kline,

2005; Thompson, 2004). In this respect, the compliance of the scale is weak, and it is necessary to eliminate the items that weaken the compliance from the test. The results of confirmatory factor analysis showing the t values made with the elimination of two items that distort the harmony are given in Figure 3.

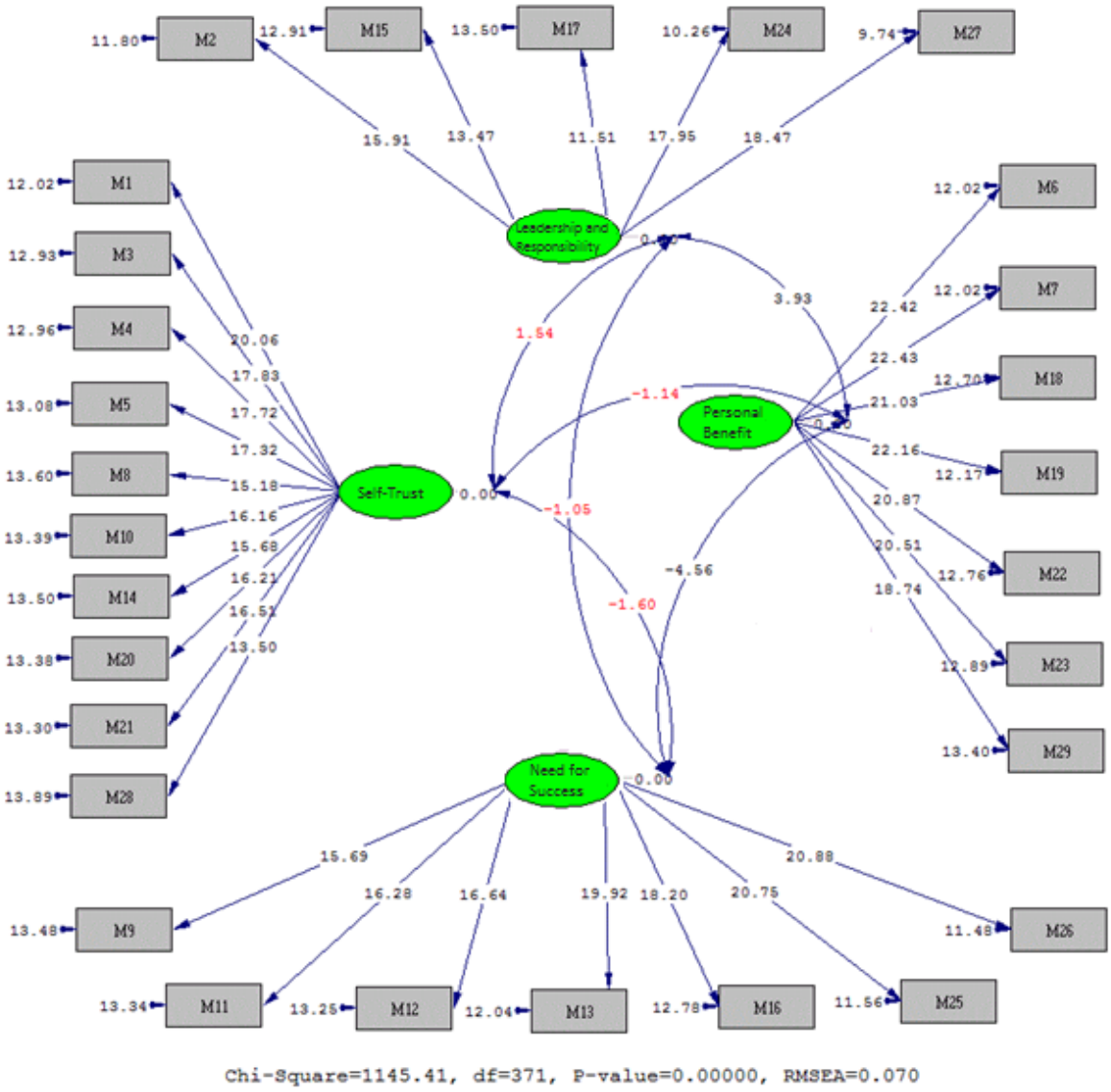

Figure 3. Observed variables of latent variables for four-factor model of entrepreneurship scale as a result of matter discard

When Figure 3 examined, it was determined that the values of 29 items did not exceed 0,05 as they did not exceed 1,96. In addition, according to the standardized solutions in Figure 4, when the error variances of the items were examined, it was observed that these values were not very close to 0 and 1. It is desirable that the error variables are not too high or too low (Cokluk, Sekercioglu, & Buyukozturk, 2012).

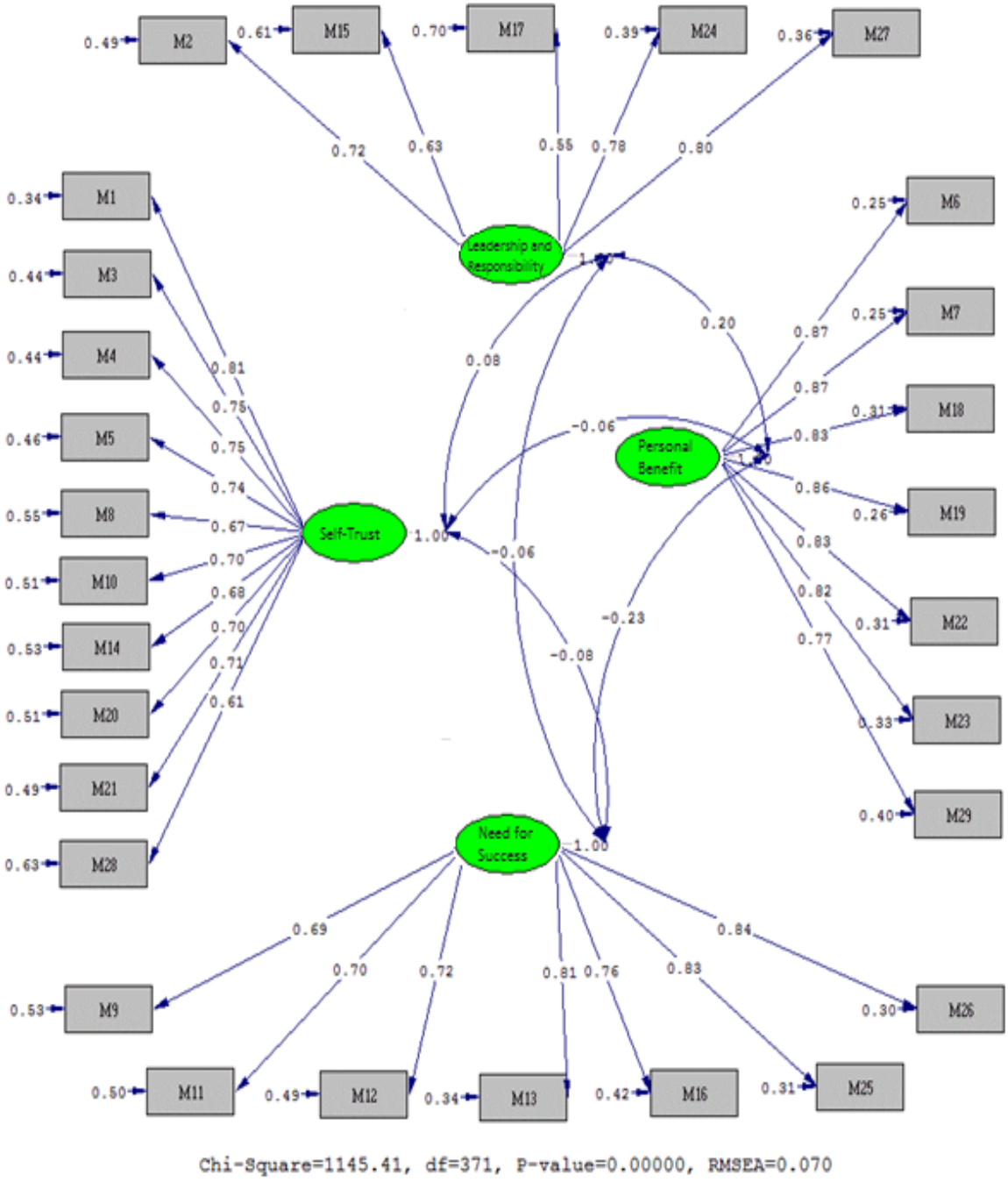

Figure 4. Investigation of error variances of items

As a result of the confirmatory factor analysis performed after the discard of the item, Chi-Square value df ratio was found as 3,08 (1145,41/371). Therefore, it was very close to perfect compliance. In addition, for the confirmatory factor analysis, the fit indices values of the scale developed according to the accepted fit indices values in the literature are presented in Table 7.

Table 7. Confirmatory factor analysis fit indices for entrepreneurship scale

Fit Indices	Model's Fit Indices Values	Criteria
Chi Square/df	3,08	Chi Square/df≤3 perfect fit (Kline, 2005); Chi Square/df≤5 intermediate fit (Meyers, Gamst & Guarino, 2006)
RMSEA	0,07	RMSEA≤0,08 (Cokluk, Sekercioglu & Buyukozturk, 2012)
GFI	0,85	GFI ≥ 0,85 (Frias & Dixon, 2005)
AGFI	0,82	AGFI ≥ 0,80 (Frias & Dixon, 2005)
CFI	0,95	CFI ≥ 0,90 (Sumer, 2000)
NFI	0,92	NFI ≥ 0,90 (Sumer, 2000)
RMR	0,035	RMR≤0,08 (Brown, 2006)

When Table 7 is examined, it is determined that the Entrepreneurship Scale model fit indices are in compliance with the fit indices in the literature. Therefore, these results indicate that the Entrepreneurship Scale has a construction validity.

Reliability Studies

As a result of validity studies, a total of four items were discarded from the test. In this section, the reliability analysis results of the scale are included. First of all, an item analysis process was carried out showing whether the items of the entrepreneurship scale were consistent within themselves. Item analysis values of the items of the scale is given in Table 8.

Table 8. Item analysis results

Item No	Corrected Item-Total Correlation	t values
1	0,522	-7,792
2	0,617	-13,443
3	0,453	-6,996
4	0,553	-9,265
5	0,527	-8,072
6	0,434	-8,716
7	0,480	-10,124
8	0,538	-9,006
9	0,292	-6,029
10	0,447	-6,767
11	0,234	-5,041
12	0,209	-4,222
13	0,463	-8,848
14	0,389	-5,390
15	0,520	-9,664
16	0,453	-10,005
17	0,103	-2,725
18	0,476	-9,446
19	0,451	-9,169
20	0,423	-6,261
21	0,564	-9,251
22	0,455	-9,374
23	0,397	-8,108
24	0,413	-8,122
25	0,449	-9,120
26	0,511	-10,638
27	0,418	-8,146
28	0,303	-4,352
29	0,467	-9,650

After the exploratory factor analysis and confirmatory factor analysis factor analyses, Corrected Item-Total Correlation and t values were given in Table 8. Corrected Item-Total Correlation value is at the lowest level in item 17 (0,103), and the highest in item 2 (0,617). The highest t values given in Table 8 is in item 2 and the lowest is in item 17.

Cronbach Alpha reliability coefficient was calculated to determine the reliability of the Entrepreneurship Scale after validity studies. The Cronbach Alpha coefficient is often used when the answers are derived from the rating scale

(Buyukozturk, Cakmak, Akgun, Karadeniz, & Demirel, 2010). After the reliability analysis, the Cronbach Alpha reliability coefficient of the scale was determined as 0,77.

Some values related to the validity and reliability analysis of the sub-factors of Entrepreneurship Scale are given in Table 9.

Table 9. Results of factor and reliability analysis of entrepreneurship scale

Factor Name	Scale Items	Factor Weights After Rotation	Explanation of Factor (%)	Reliability
Self-confidence	1	0,836	21,761	0,91
	3	0,782		
	4	0,796		
	5	0,773		
	8	0,725		
	10	0,742		
	14	0,712		
	20	0,745		
	21	0,764		
	28	0,643		
Need for Success	9	0,720	18,986	0,91
	11	0,726		
	12	0,716		
	13	0,820		
	16	0,860		
	25	0,843		
	26	0,853		
Personal Benefit	6	0,861	13,486	0,94
	7	0,869		
	18	0,841		
	19	0,870		
	22	0,846		
	23	0,842		
	29	0,815		
Leadership and Responsibility	2	0,778	9,904	0,82
	15	0,694		
	17	0,685		
	24	0,803		
	27	0,800		
Total			64,138	0,77
Kaiser Meyer Olkin Scale Validity				0,877
Bartlett Sphericality Testing Chi Square				10939,486
P value				0,000

When Table 9 is examined, factors determined for Entrepreneurship Scale items, percentages of variance explanation for these factors, reliability values related to each of the factors, KMO and Bartlett test results are summarized.

Discussion

In this study, it was aimed to develop a valid and reliable measurement tool to determine the entrepreneurship skills of 5th grade students. The Entrepreneurship Scale developed for the purpose had 33 items before the pilot application, and 4 items were eliminated after the pilot application. Finally 29 items were determined. To determine the validity of the scale, content validity and construct validity were examined. Exploratory and confirmatory factor analysis were performed to construct the validity. As a result of exploratory factor analysis, it was determined that the scale had five factors and two items in the scale received high values on more than one factor. After these two items were eliminated, it was determined that the scale reduced to four factors. After rotated factor analysis, it was seen that factor loads of the items were found higher than 0,643. In the exploratory factor analysis, that the factor load value is 0,45 or above is considered a good criterion (Bayram, 2012). Therefore, it can be said that the factor loads of the items are large enough. The variance rate explained in the analysis after the elimination of the item was found as 64,138. According to Tavsancil (2010), the variance rates explained in multi-factorial structures are enough as they are over 40%. In this context, it can be said that in Entrepreneurship Scale has adequate variance ratio.

As a result of exploratory factor analysis, a structure with 4 sub-factors emerged in the scale. These sub-factors were named as 'self-confidence', 'need for success', 'personal benefit' and 'leadership and responsibility'. It is stated that it is necessary to determine and to develop the self-confidence of the students for the entrepreneurship education (Heckman, Jora Stixrud, & Urzua, 2006). It is also stated that students should develop entrepreneurship skills to provide personal benefits for themselves (Kaygin & Guven, 2013). Esmer and Dayi (2017) stated that one of the important factors that determine the entrepreneurship features of the individuals is to take responsibility and to have leadership characters. Deveci (2018) has developed four factors to measure the entrepreneurial skills of secondary school students and he has named them as risk taking, success need, team work and effective communication. It is seen that the factor ''need to succeed'' corresponds 'need for success' factor of this study. It is stated that the entrepreneurship characteristics of individuals with high sense of achievement are higher (Ozden, Temurlenk, & Basar, 2008). On the other hand, self-reliant individuals are said to have higher entrepreneurial characteristics because they think that the results of the events have emerged with their own abilities (Iscan & Kaygin, 2011). In this context, it can be said that the 'self-confidence' factor, one of the sub-factors of the scale, is one of the important characteristics of entrepreneurship. Entrepreneurship skills of individuals who take responsibility and work as leaders in their jobs are better than the others (Ahmetoglu, Leutner, & Premuzic, 2011). Therefore, the 'leadership and responsibility' sub-factor related to entrepreneurial skills supports the findings of the study. Muftuoglu, Tamer and Durukan (2004) stated in their study that the entrepreneurial individuals consider their own benefits at first, which supports the 'personal benefit' factor of this research.

Conclusions

Confirmatory factor analysis was performed to confirm the construct validity of the factor structure after the exploratory factor analysis. With the analysis, it was found out that there was no meaningful value at 0,05 level as the t values of the two items in the scale did not exceed 1,96. In confirmatory factor analysis, it is necessary that the values of t are higher than 1,96 (Cokluk et al., 2012). When these two items were eliminated, and re-confirmatory factor analysis was performed, it was determined that all t values of the items exceeded 1,96. In addition, the results of the confirmatory factor analysis revealed that the chi-square/df, RMSEA, GFI, AGFI, CFI, NFI, and RMR fit indices values are in accordance with the criteria specified in the literature. Therefore, it was determined that the remaining 29 items were verified by confirmatory factor analysis and made ready for reliability analysis.

The Cronbach Alpha internal consistency coefficient of the scale was determined as 0,77. When the reliability values of the sub-factors were examined, it was determined that the self-confidence sub-factor was 0,91, the sub-factor of need for success was 0,91, the personal benefit sub-factor was 0,94 and the Cronbach Alpha internal consistency coefficient of the leadership and responsibility sub-factor was 0,82.

The limitation of this research is that the entrepreneurship scale was developed for the 5th grade students. It is suggested that the scale items should be improved if used for the upper grades. The items of the scale were developed for the young age groups (11-12 years old). It is important that the validity and reliability studies should be done if the scale is used for the upper age groups by improving the items of the scale.

According to these results, a valid and reliable 'Entrepreneurship Scale' data collection tool with four factors was developed to measure the entrepreneurship skills of 5th grade students.

Suggestions

Based on the results of the research, the following suggestions can be presented:

- The developed Entrepreneurship Scale can be used by teachers to determine students' entrepreneurial skills.
- The developed scale can be used by the researchers to guess the entrepreneurial skills of the students in terms of different variables.
- The developed scale can be applied in the researches done in the future and comparisons can be made on students at different levels of secondary school.

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APPENDIX-1 Entrepreneurship Scale for 5th Grade Students

Dear students,
Below are some sentences for you to answer. This is not an exam. There is no right or wrong answer. Just check the section that best suits you. Please answer all questions.

Thank you for your help.

No	Items	Always	Sometimes	Never
01	I'm afraid to speak up in a lesson.			
02	I prefer to sit in the back row at school.			
03	I don't want the teacher to put me on the board even though I know the answer.			
04	I feel scared that I will warn her/him if my teacher types something wrong on the blackboard.			
05	I can't ask for money from my father for pen when my pen is lost.			
06	I don't hesitate to ask back when I give my friend something to borrow.			
07	I tell my teacher when I feel sick in class.			
08	When I could not do my homework, I could tell the reason to my teacher.			
09	I don't hesitate to do experiment in science laboratories.			
10	On special occasion program, I'm afraid to read the text before the audience.			
11	When I prepare a project from any course, I do not hesitate to tell my friends in the course.			
12	I get excited when presenting my project at science fairs in school.			
13	I go to my teacher at break-time and ask him questions I don't understand easily.			
14	I don't want my teacher to tell my score when he/she is reading our test-results in the classroom.			
15	I don't hesitate to play with them when they call me from different classes.			
16	When I make an experiment in science class, I tell this experiment to the whole class.			
17	I make friends with people I don't know.			
18	I would not hesitate to give back what I bought.			
19	I am surprised when I go to a place I cannot ask where people go where I am.			
20	I can't talk to anyone familiar if I walk on the road.			
21	When we go on a trip to school, I ask my teacher about the new places.			
22	I can't ask for the same meal a second time after eating a favorite meal in a guest house.			
23	I can't say no to anyone, I can't break anybody.			
24	I always want to be a leader in any job I do with my friends.			
25	I would like to take part in a group for a project.			
26	I would like to participate in this game when my teacher wants to play an educational game.			
27	I want to be a class president.			
28	I do not hesitate to enter the school principal's office and get permission.			
29	I cannot tell anyone who is passing behind me when I am in the lunch line.			
30	When I discover a product at school, I don't hesitate to tell everyone.			
31	I'm afraid of doing it wrong.			
32	When I'm done with an item that's mine, I sell it to my friends.			
33	When I buy something with my friends, I'II collect the money.			

APPENDIX-2 Entrepreneurship Scale for 5th Grade Students (Turkish)

Soru No	Girisimcilik ile ilgili maddeler	Her zaman	Bazen	Hicbir zaman
01	Derste parmak kaldirmaktan cekinirim.			
02	Okulda arka siralara oturmayi tercih ederim.			
03	Soruyu bildigim halde ogretmenin beni tahtaya kaldirmasini istemem.			
04	Ogretmenim tahtaya yanlis bir sey yazsa onu uyarmaktan korkarim.			
05	Kalemim kayboldugunda babamdan kalem parasi isteyemem.			
06	Arkadasima odunc bir sey verdigimde geri istemekten-cekinmem.			
07	Derste rahatsizlandigimda ogretmenime bu durumu soylerim.			
08	Odevimi yapamadigimda bunun sebebini ogretmenime soylerim.			
09	Fen laboratuvarlarinda deney yapmaktan cekinmem.			
10	Ozel bir programda seyircilerin karsisina cikarak bir yazi okumaktan korkarim.			
11	Herhangi bir dersten proje hazirladigimda bunu derste arkadaslarima anlatmaktan cekinmem.			
12	Okulda yapilan bilim fuarlarinda projemi sunarken-heyecanlanirim.			
13	Anlamadigim sorulari teneffuste ogretmenimin yanina gidip rahatlikla ona soruyu sorarim.			
14	Ogretmenim yazililari okurken benim notumu sinifa soylemesini istemem.			
15	Farkli siniflardan beni oynamaya cagirdiklarinda onlarla oyun oynamaktan cekinmem.			
16	Fen dersinde bir deney yaptigimda bu deneyi tum sinifa anlatirim.			
17	Tanimadigim insanlarla arkadas olurum.			
18	Satin aldigim seyleri geri vermekten cekinmem.			
19	Bir yere giderken adresi sasirdigimda insanlara gidecegim yerin ne tarafta oldugunu soramam.			
20	Yolda yururken tanidik birisi yanimdan gecse onunla konusamam.			
21	Okulca bir geziye gittigimizde yeni gordugum yerlerle ilgili ogretmenime sorular sorarim.			
22	Misafirlikte sevdigim bir yemekten bir kez yedikten sonra ikinci kez ayni yemekten isteyemem.			
23	Hic kimseye hayir diyemem, kimseyi kiramam.			
24	Arkadaslarima beraber yaptigim herhangi bir iste her zaman lider olmak isterim.			
25	Derste bir proje icin grup olusturuldugunda o grupta yer almak isterim.			
26	Derste ogretmenim egitici bir oyun oynatmak istediginde bu oyuna katilmak isterim.			
27	Sinif baskani olmak isterim.			
28	Okul mudurunun odasina girip izin almaktan cekinmem.			
29	Yemek sirasinda onume gecen birisine arkaya gecmesi gerektigini soyleyemem.			
30	Okulda bir urun ortaya koydugumda bunu herkese anlatmaktan cekinmem.			
31	Yanlis yapmaktan korkarim.			
32	Benim olan bir esyayi isim bittiginde arkadaslarima satarim.			
33	Arkadaslarimla beraber bir sey satin alacagimiz zaman paralari ben toplarim.			