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# Entrepreneurship Competencies of School Principals: A Scale Development Study

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## Abstract

This research aims to produce a reliable and valid scale that includes the entrepreneurship competencies of school principals according to the perceptions of teachers working in state-owned schools. First, after the literature review, an item pool consisting of five-point Likert item type and seventy-four items was created, and then the relevant items were presented to eleven experts to determine the content validity. After the expert evaluations, the content validity rates of the relevant items were calculated with the Lawshe technique, the nineteen items below the criterion value were removed from the scale, and a scale draft form consisting of fifty-five items was created. To carry out the EFA of the scale, the first application was performed with 436 teachers working in Çekmeköy district of Istanbul province on an online platform in March-April 2020. In the EFA process carried out in line with the data obtained, observations revealed that the scale had a four-factor structure. Then, the Varimax technique was used to clarify the distribution of scale items to factors, and seventeen items that were found to have a load of .30 and above from more than one factor and that the load difference was less than .100 were removed from the scale. As a result of EFA, a scale consisting of 38 items and subdimensions of "Personal Competencies", "Organizational Competencies", "Relational Competencies", and "Commitment Self-Confidence Competencies" which explain 73.32% of the total variance was obtained. Subsequently, reliability coefficients of the scale (Cronbach's Alpha .98), discrimination indices, item-total – item-residual correlations, and correlations between scale total and subdimensions were calculated. Finally, to carry out the CFA, the second application was carried out online with a sample of 724 teachers in May-June 2020 and the obtained goodness of fit values confirmed the scale model. All these obtained values confirm the valid and reliable structure of the developed scale.

**Keywords:** Entrepreneurship, Entrepreneurship Competencies, School Principals, Scale Development

## Introduction

The concept of entrepreneurship has been defined from various perspectives such as introducing a new invention or producing a new product (Schumpeter, 2011), mobilizing resources and maximizing opportunities (Blake & Mestry, 2014), creating new organizations to pursue opportunities (Bygrave, 1992), determining the unused opportunities (Hitt, Ireland, Camp, & Sexton, 2002), a dynamic vision, the process of change and creation (Kuratko, 2017), and the creation of new enterprises and products (Mazzarol & Reboud, 2017). In this respect, entrepreneurship can be considered as the process of directing existing creative mental processes to innovation and change by the individual, creating new initiatives by creating opportunities and taking risks.

Entrepreneurship is an important element, especially in the economic competition of societies and their emergence as an economic power, therefore, entrepreneurship competencies have attracted attention in recent years (Armuna, Ramos, Juan, Feijóo, & Arenal, 2020). Man, Lau, and Chan (2002) state that entrepreneurship competencies encompass a higher level of competence that includes personal characteristics, skills, and knowledge. According to Man et al. (2002), these competencies are; (1) relationship competencies, (2) opportunity competencies, (3) organizing competencies such as team building or leadership, (4) conceptual competencies such as being proactive or taking risks, (5) strategic competencies including project management, (6) engagement competencies that include the ability to overcome hard work. Mitchelmore and Rowley (2010), on the other hand, proposed a four-category framework for entrepreneurship. These are; (1) entrepreneurial

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competencies, (2) human relations competencies, (3) conceptual competencies, and (4) business and management competencies. Chen, Greene, and Crick (1998) discussed entrepreneurship competencies in the context of self-efficacy and suggested a five-category competency framework. These are; (1) innovation, (2) financial control, (3) management, (4) marketing and (4) risk-taking.

A study was carried out by the European Commission in 2016 to increase the entrepreneurship capacity of European citizens and organizations under the name of "The Entrepreneurship Competence Framework" known as "EntreComp". Fifteen competence elements were determined with this study. These are spotting opportunities, vision, creativity, sustainable and ethical thinking, valuing ideas, self-efficacy and self-awareness , perseverance, motivation and, mobilizing resources, economic-financial literacy, taking the initiative, mobilizing others, management and planning, uncertainty & risk, coping with ambiguity, learning through experience and working with others (Bacigalupo, Kampylis, Punie, Van den Brande, 2016).

The literature on entrepreneurship mostly focuses on the personality, traits, and qualities of an entrepreneur. Accordingly, Van der Kuip (1998) summarized the characteristics of entrepreneurs with elements such as motivation, creativity, need for autonomy, independence, taking risks, taking initiative, thinking about possibilities, self-confidence, setting challenging goals, resilience, internal locus of control, and originality (as cited in Onstenk, 2003). Kets de Vries (1993) and Mintzberg (1990) emphasize that entrepreneurs have the power for independence and success and they have a strong need to maintain control. However, the managerial or organizational roles of entrepreneur individuals also cover an important area in these competencies. These managerial competencies can be evaluated as planning, organization, financial management, leadership, and control and these managerial roles have changed with the age towards new management competencies such as facilitator, enabler, and coordinator, change manager, communicator and negotiator, and internal consultant (Onstenk, 2003).

Entrepreneurship competence is an integrated skill related to performing entrepreneurial activities adequately and solving entrepreneurship problems. A competent entrepreneur can use his/her knowledge, attitude, and skills to cope with difficulties (such as tasks, dilemmas, problems, and contradictions arising from the intense competition or changing demands of customers) (Onstenk, 2003). In this sense, Dornelas (2008) formulated elements such as a vision of the future, consistent decision, search for opportunity, dynamism and determination, devotion, passion and optimism, independence, good relations, leadership, organization, knowledge, planning, acceptance of calculated risks and creating value for society as the most important characteristics of entrepreneurs.

Minello et al. (2014) listed entrepreneurship competencies as relationship, opportunity, conceptual, strategic and commitment, administrative (managerial) competencies in the literature. However, McClelland (1961) described the characteristics of entrepreneurs as the need for high success and reasonable risk-taking; J.A. Timmons expressed as commitment and determination, taking responsibility, constantly seeking opportunity, high self-confidence, creativity and flexibility in problem-solving, high energy, long-term perspective and being future-oriented, learning and not being afraid of failure, visionary leadership (as cited in Zimmerer & Scarborough, 1996); Bhatt (2016) indicated as the need for success, spontaneous action, desire to take risks, self-confidence, creativity and innovation, commitment, openness to new ideas, effective time management, leadership and decision-making ability, and desire for independence.

Kuratko and Hodgetts (1998) identified seventeen entrepreneurial characteristics that are likely to be present among entrepreneurs as well as related to the entrepreneurial process. These are commitment, moving on to achieve success, perseverance and determination, opportunity orientation, internal locus of control, persistent problem solving, failure tolerance, calculated risk-taking, innovation and creativity, self-confidence and optimism, initiative and responsibility, team building, uncertainty tolerance, seeking feedback, high energy, integrity and reliability, independence and vision.

Lackeus (2015) defined the knowledge, skills, and attitudes that motivate entrepreneurs towards entrepreneurship and increase their willingness in the process of creating a new value. According to Lackeus (2015), while the elements such as the knowledge possessed and presented about entrepreneurship elements such as mental models that include information about how to do things without risk, resources and probability models, opportunities, value creation, finance, idea generation, marketing, technology, accounting, risk and others and insight including personal compliance knowledge by being an entrepreneur or entrepreneurial constitute the knowledge dimension, factors such as marketing, interpersonal relationships, fundraising, learning, opportunity, and strategic skills constitute the skill dimension, and entrepreneurial passion, self-efficacy, entrepreneurial identity, proactivity, innovativeness, uncertainty tolerance, and perseverance constitute the attitude dimension. Dollinger (2008) made a classification of entrepreneurship as the creation of a new enterprise, individual, environmental, opportunity analysis, and organizational dimensions.

An important field of application of the talent and skill areas of entrepreneurship is educational organizations. In this direction, Abbas (2014) states that entrepreneurship competencies in educational organizations contain two meanings and applications. These are (1) to strive to apply entrepreneurial values in the management of educational organizations and (2) to transform the potential of an educational organizations into economic activities in obtaining benefits that can be used to develop and advance the educational organizations. Mulyasa (2005) states that to create an effective, generative, independent, and developed school, school principals should have ten key competencies to achieve success in leadership processes. These are (1) having a vision, (2) setting an example, (3) responsibility, (4) developing teachers and staff, (5) providing the best service, (6) encouraging a sense of unity and togetherness, (7) managing by prioritizing applications (8) focusing on students, (9) setting leadership style, and (10) utilizing power and expertise to strengthen schools (Abbas, 2014; Mulyasa, 2005, as cited in Syapriyuda & Santosa, 2020). These competence components also constitute important talent and skill gains for school leaders in guiding the entrepreneurship process in schools.

Having entrepreneurial competencies in an educational context, school leadership includes expectations and goals that are integrated into the school's mission, vision, strategic plan and goals by the school's abilities, conditions, and supporting factors. In the context of institutional innovation, entrepreneur principals can develop and implement new ideas that lead to critical change and development in schools. Thus, they also ensure the development of creative and innovative attitudes put forward by teachers and other employees in the process (Wibowo & Saptono, 2018; Pihie, Asimiran, & Bagheri, 2014; Ruskovaara, Pihkala, Rytkölä, & Seikkula-Leino, 2011).

According to Yemini, Addi-Raccah, and Katarivas (2014), the entrepreneurship of school principals is guided by certain visions and values that are important to them and adopted by school employees. In this sense, the success of school principals in entrepreneurship activities depends mostly on the fact that school principals gain the commitment of school personnel to their visions. According to Yemini et al. (2014), entrepreneur school principals are not affected by monetary or financial constraints to realize their entrepreneurial visions, they are not afraid to start a new project even if no funds are provided, in other words, they feel ready to take risks and are self-confident. Alfirevic, Vican, Pavicic, and Petkovic (2018) stated that school principals who have entrepreneurial orientation make use of entrepreneurial opportunities, perceive themselves as creative persons, innovation and success-oriented, good problem solver, communicator, and leader, they can develop new and market-oriented proposals, new business relationships and connections, accept responsibility by taking risks, and consider themselves competent in creating financial resources for the school.

As a result, dynamic factors such as a rapidly changing world, increasing accountability and localization, improving performance in teaching and learning require school principals to have entrepreneurial competencies (Research Centre for Learning and Teaching of Newcastle University, 2015). For this reason, revealing the entrepreneurship competencies of school principals in the school leadership dimension of educational processes will provide an advantage to the education systems of countries in changing education and competition conditions. At the same time, it is important to develop a scale that will reveal these competencies and facilitate the selection of school leaders with entrepreneurial orientation and evaluation of their performance. In this direction, this research aims to develop a reliable and valid scale that includes the entrepreneurship competencies of school principals and the items covering these competencies according to the perceptions of teachers working in public schools.

## Method

### Research Model

The research was carried out using the screening model to develop the "Entrepreneurship Competencies Scale". Screening models are pieces of research carried out on the whole of the population or on the sample taken from it to make a general judgment about the population consisting of many elements. In this model, there is what is intended to be known and it is there, the important thing is to observe and determine it properly (Karasar, 2012).

### Population and Sample

The application of the scale was carried out in two stages. In the first application, "EFA" was performed to determine the construct validity and subdimensions of the scale, and in the second application, "Confirmatory Factor Analysis (CFA)" was performed to verify the scale model obtained. The first application was carried out in March and April 2020, and the second in May and June 2020. Teachers working in the state primary, secondary and high schools (secondary education) in Çekmeköy district on the Anatolian side of Istanbul

constitute the population of the study. The total number of teachers in the research population (primary school-secondary school-high school) is 1826. The sample number calculation method developed by Cochran (1977) was used to determine the required sample size of the population (as Cited in Gürbüz & Şahin, 2018). According to this method, the minimum sample size to be reached in a population of 1826 is presented below;

N: Population size: 1826
n: Sample size: ?
t: Table z value corresponding to the confidence level: z value corresponding to 0.05 (confidence level 95%) is 1.96.
S: The std. deviation estimated for the population: 0.5
d: Acceptable deviation tolerance: 0.05

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

$$n_0 = [(t \times S)/d]^2 \qquad n_0 = \frac{1.96^2 \times 0.5^2}{0.05^2} = 384.16$$

$$n = \frac{384{,}16}{1+384{,}16\,/1826} = 317$$

In the research, the stratified sampling was used to reach the relevant sample, and each education level (primary, secondary, and high school) was determined as a stratum, and participants with a proportional value from each stratum were included in the sample. In the stratified sampling method, the research population is divided into sub-strata that are similar in themselves, and the units to be included in the sample are randomly selected from these sub-strata within the framework of their ratios in the population. Because similar subgroups of the universe are taken into account within the framework of their ratios in the population, the level of representation of the universe by this method is higher than other methods, and at the same time, the sampling error is lower (Gürbüz & Şahin, 2018). Although the minimum number of samples calculated in the study and required to be reached was 317, in the framework of the idea that the reliability and validity of the applied scale would increase and the error about the population would decrease as the sample mass grew (Altunışık, Coşkun, Bayraktaroğlu, & Yıldırım, 2010) and after the systematically marked scale forms were removed, 436 participants were reached in the first application (EFA) and 724 participants in the second application (CFA).

**Creating the Pool of Items and Submitting the Items to Expert Opinion**

In the process of developing the Entrepreneurship Competencies Scale, primarily, the literature on entrepreneurship and entrepreneurs' characteristics and competencies was reviewed and a candidate item pool consisting of 74 items covering the relevant field was created. According to Clark and Watson (1995), the main purpose of creating an item pool is to sample all the content potentially related to the target structure to be measured. The studies used in the creation of the item pool are as follows;

Table 1. The Researchs Used in the Creation of the Items of the EC Scale

| | | |
|---|---|---|
| Schumpeter (2011) | Drucker (1985) | Kets de Vries (1993) |
| Blake & Mestry (2014) | Gupta, MacMillan & Surie (2004) | Gibb (1998) |
| Bygrave (1992) | Thornberry (2006) | Tolentino (1998) |
| Mazzarol & Reboud (2017) | Van der Kuip (1998) | Bueno, Leite & Pilatti (2004) |
| Bhatt (2016) | Mintzberg (1990) | Dornelas (2008) |
| Minello, Scherer & Alves (2014) | McClelland (1961) | Zimmerer & Scarborough (1996) |
| Abbas (2014) | Kuratko & Hodgetts (1998) | Pahuja & Sanjeev (2015) |

| | | |
|---|---|---|
| Stevenson & Jarillo (1990) | Currie, Humphreys, Uçbaşaran & McManus, (2008) | Slater & Doig (1988) |
| Ghasemi, Rastegar, Jahromi & Marvdashti (2011) | Najim et.al. (2013) | Nieman, Hough & Nieuwenhuizen (2004) |
| Du Toit (1990) | Alberti, Sciascia & Poli (2004) | Ayub & Othman (2013) |
| Zimmerer & Scarborough (2001) | Norasmah (2002) | Fernald, Solomon & Tarabishy (2005) |
| Kirkley (2017) | Yemini et.al. (2014) | Alfirević, Vican, Pavičić & Petković (2018) |

One of the most important focal points in scale development is the content validity of the created items. Content validity (CV) is often seen as the initial and lowest level requirement for measurement sufficiency. Content validity is checked immediately after the items are created, and it allows making necessary changes and improvements before preparing the scale (Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993). After creating an item pool, candidate items were submitted to the opinion of eleven referees who had the expertise to evaluate the relevant subject area and item properties, eight of whom were experts in the field of Educational Management and could evaluate the field of entrepreneurship, and three of whom were experts in the field of Measurement and could evaluate the item properties. An invitation was sent to the referees by e-mail to evaluate the candidate items, and the referees were requested to grade the items with three levels (must be removed, must be revised, must remain), to evaluate whether the items cover the relevant area and the item properties, and to write in the blank under the relevant item that needs to be revised about what kind of correction should be made.

**Calculation of Content Validity Ratio (CVR) and Index (CVI)**

The evaluations from the experts (referees) were combined in a single form, and to obtain the content validity ratios of the candidate items, the CVR of each item and then the CVI of the scale were obtained using the Lawshe (1975) technique. CVR are calculated by the number of experts expressing the "necessary (must remain)" opinion for any item over one less than half of the total number of experts expressing an opinion. The CVI is obtained from the mean of the CVR of the items that are significant at the 0.05 level and will be included in the final form. The criterion values for whether the candidate items have content validity or not were transformed into a table by Veneziano and Hooper (1997), and minimum values measuring the content validity according to the number of experts (referees) at a significance level of 0.05 were established. According to these criterion values given below, the minimum CVR value was determined as 0.59 in 11 expert evaluations (as cited in Yurdugül, 2005).

Table 2. Minimum Values for CVRs Determined by Veneziano and Hooper (1997)

| Number of Referees | Minimum CVR Criterion |
|---|---|
| 5 | 0.99 |
| 6 | 0.99 |
| 7 | 0.99 |
| 8 | 0.78 |
| 9 | 0.75 |
| 10 | 0.62 |
| **11** | **0.59*** |
| 12 | 0.56 |

* $\alpha = 0.05$ Significance Level

After expert evaluations, the calculated CVR values of the candidate items were compared with the relevant criterion value .59, and 19 items that did not meet the CVR criterion were removed from the scale. At the same time, the CVI was calculated by taking the mean of the CVR values of the items that met the content validity rate criterion. The content validity index rate obtained was calculated as .75. A higher CVI value of .16 than the content validity criterion indicates that the items have good content validity. As a result, it is possible to observe that the remaining items have significant content validity (Lawshe 1975).

Table 3. Content Validity Ratios (CVRs) and Content Validity Index (CVI) Obtained After Expert (Referee) Evaluation of Candidate Items of ECS

| | | | | | |
|---|---|---|---|---|---|
| Number of Experts | | | 11 | | |
| Item Content Validity Criterion | | | 0.59 | | |
| Number of Items under the CVR Criterion | | | 19 | | |
| Content Validity Index | | | 0.75 | | |
| **Items** | **CVR** | **Items** | **CVR** | **Items** | **CVR** |
| 1 | 0.64 | 26 | 0.64 | 51 | 0.82 |
| **2** | **-0.09*** | 27 | 0.64 | **52** | **0.09*** |
| 3 | 0.64 | 28 | 0.64 | **53** | **0.45*** |
| 4 | 0.64 | 29 | 0.82 | 54 | 0.64 |
| 5 | 0.82 | 30 | 0.64 | 55 | 0.64 |
| 6 | 0.64 | **31** | **0.45*** | **56** | **0.09*** |
| 7 | 1.00 | 32 | 0.64 | 57 | 0.82 |
| 8 | 0.82 | **33** | **0.45*** | 58 | 1.00 |
| 9 | 0.64 | 34 | 1.00 | 59 | 0.64 |
| **10** | **0.45*** | 35 | 0.64 | **60** | **0.27*** |
| **11** | **0.45*** | 36 | 0.64 | **61** | **0.27*** |
| 12 | 0.82 | 37 | 0.82 | 62 | 0.82 |
| 13 | 0.64 | 38 | 0.64 | 63 | 0.82 |
| 14 | 0.82 | 39 | 0.82 | **64** | **0.45*** |
| 15 | 0.64 | 40 | 0.64 | 65 | 1.00 |
| **16** | **0.45*** | 41 | 0.64 | 66 | 0.82 |
| 17 | 0.82 | **42** | **0.45*** | 67 | 0.64 |
| **18** | **0.27*** | 43 | 0.82 | 68 | 0.82 |
| 19 | 0.64 | 44 | 1.00 | **69** | **0.45*** |
| **20** | **0.09*** | **45** | **0.45*** | 70 | 0.82 |
| 21 | 0.82 | 46 | 0.82 | 71 | 0.64 |
| 22 | 1.00 | 47 | 0.64 | **72** | **0.27*** |
| 23 | 0.82 | 48 | 0.64 | 73 | 0.64 |
| 24 | 0.82 | 49 | 0.64 | **74** | **0.45*** |
| 25 | 0.64 | 50 | 0.82 | | |

*19 items below the Content Validity Measure (0.59) were removed.

**Revision of Some Items According to Referees Opinions and a Pilot Survey**

The 12 items (3, 6, 8, 26, 27, 28, 39, 47, 48, 55, 59, 71), which the experts had requested to be revised among the items remaining after the content validity analysis and the expert evaluations of the candidate items of the ECS, were corrected in line with the consistent opinions of the referees. At the same time, the items were examined by two Turkish teachers and reviewed in terms of spelling rules and punctuation marks. After this editing, the scale item draft form consisted of 55 items, and the items of the scale were re-ordered randomly (1. 2. 3… .55.); at the same time, a five point Likert-type rating ("Strongly Disagree", "Disagree", "Partially Agree", "Agree", "Strongly Agree") was preferred for grading the items. The scale draft form was implemented as a pilot survey for 20 teachers in a secondary school in Çekmeköy district of Istanbul province. The pilot survey was carried out directly by the implementer, the opinions of the participants regarding the items and the draft form were noted during the application and the participants were asked to write their evaluations about the items in the draft form after the application. In line with the feedback obtained after the application, some corrections (generally writing and spelling corrections) were made and the scale form was made more useful. Then, the final scale application form was prepared.

**Data Collection and Analysis**

In the process of developing the Entrepreneurship Competencies Scale, an online scale form was used to collect data from the relevant sample, and the application of the scale was carried out in two stages. In the first stage, "EFA" was performed to reveal the construct validity and sub-dimensions of the scale, and in the second stage, "CFA" was performed to verify the scale model obtained. In order to analyze the data obtained during the scale development process; The SPSS package program was used to perform EFA, reliability and discrimination analyzes and correlation analyzes, and the Lisrel program was used to perform CFA, which is used to determine whether the scale model is verified or not.

## Results

The results of the reliability and validity analysis of the scale and the findings obtained by comparing these results with the criterion values are presented below.

**Exploratory Factor Analysis (EFA)**

During the EFA process, firstly the data obtained from the sample were transferred to the SPSS 21 system and the data were cleared of outliers. Then, the Skewness-Kurtosis values of the data set were examined to determine whether the data set showed normal distribution (univariate normality assumption). In a normal distribution, "Skewness-Kurtosis" values are zero (Field, 2009). Therefore, the closer these values to zero, the normality of the distribution increase. Accordingly, some authors (George & Mallery, 2010) stated that when the data set's "Skewness-Kurtosis" values between +2 and -2 and some authors (Tabachnick & Fidell, 2015) stated that the "Skewness-Kurtosis" values between +1.5 and -1.5 meet the normality of the data set. The calculated Skewness (-.630) and Kurtosis (-.111) values of the scale were observed to be within the range specified by the authors, so the assumption that the data set showed a normal distribution was confirmed.

The correlation matrix of the relevant data set was examined before proceeding with the factor analysis and it was checked whether there was any item with a correlation value below .30 (Tabachnick & Fidell, 2015). In the examination, no item with a correlation value below .30 was found. Then, the anti-image correlation values of the items were examined and it was checked whether there was any item with a correlation value below .50 (Tabachnick & Fidell, 2015). In the examination, an item with an anti-image correlation value below .50 was not detected and all of them were .90 and above. To reveal whether the sample is sufficient for factor analysis, the Kaiser Mayer Olkin (KMO) value was calculated and found to be .985. According to Hutcheson and Sofroniou (1999), KMO value was stated as a medium between .50 and .70, good between .70 and .80, very good between .80 and .90, and excellent above .90. In this sense, the KMO value obtained is at an excellent level. To determine whether there is a high correlation between variables and whether the data set comes from a multivariate normal distribution, the Bartlett Test of Sphericity was conducted and it was found to be significant at the $p < .001$ level ($x2 = 28274.82$; $df = 1485$). The significance of the Barlett test proves that the data comes from a multivariate normal distribution and shows linearity (Tavşançıl, 2010). All these obtained values show the factorizability of the scale and provide valid parameters for the subdimensions to be revealed.

Table 4. KMO ve Bartlett Test Values of the EC Scale

| | | |
|---|---|---|
| KMO Sample Adequacy | | .985 |
| Barlett Test | Ki-square Value | 28274.82 |
| | Degree of Freedom | 1485 |
| | P | .000 |

After the KMO and Barlett tests, EFA was performed to determine the construct validity of the scale and to determine the distribution of scale items to factors or dimensions. Varimax technique was used in the EFA process because it provides convenience in principal component analysis and naming factors (Altunışık et al., 2010). The principal component analysis is used to discover which variables in the data set combine to form a subset (Tabachnick & Fidell, 2015). In determining the factors in the EFA process, the eigenvalue was taken as 1 and the acceptable minimum load value of the factors was determined as .30 (Büyüköztürk, 2006; Ntoumanis, 2001). Tabachnick and Fidell (2015), on the other hand, determined this value as .32. In this reserach, the minimum factor load value was determined as .30.

Table 5. The Number of Factors Obtained After EFA of the EC Scale and the Total Variance Explained by Factors

| Factors | Initial Eigenvalues | | | Total Factor Loads | | |
|---|---|---|---|---|---|---|
| | Total | Variance % | Set % | Total | Variance % | Set % |
| 1 | 36.349 | 66.089 | 66.089 | 36.349 | 66.089 | 66.089 |
| 2 | 1.487 | 2.703 | 68.792 | 1.487 | 2.703 | 68.792 |
| 3 | 1.239 | 2.253 | 71.045 | 1.239 | 2.253 | 71.045 |
| 4 | 1.077 | 1.959 | 73.004 | 1.077 | 1.959 | **73.004** |
| 5 | .849 | 1.544 | 74.548 | | | |
| 6 | .763 | 1.388 | 75.935 | | | |
| 7 | .730 | 1.327 | 77.262 | | | |
| 8 | .635 | 1.154 | 78.417 | | | |
| | ……. | ……. | ……. | | | |
| 55 | .79 | .143 | 100 | | | |

* Factor Method: Princ. Comp. Analysis
**Rotat. Method: Varimax

After EFA analysis performed as seen in Table 5 above, it is possible to observe that the scale is collected in 4 factors with an eigenvalue greater than 1 and the total variance amount explained by these factors is 73%. After this process, the Varimax technique was used to clarify the distribution of scale items to factors and to reveal the dimensional plane of the items. The Varimax orthogonal rotation technique clarifies the distribution of items or variables to factors by maximizing the high correlation values in the correlations between variables and factors and minimizing the low ones. The Varimax technique is also a method of maximizing the variance of loads on each factor (Tabachnick & Fidell, 2015). After the Varimax technique, observations exhibited that some items had a load of .30 and above from more than one factor, and items with a load difference of less than .100 were excluded from the scale. In this process, the items 5, 6, 17, 19, 21, 22, 23, 24, 26, 37, 39, 40, 43, 46, 52, 53, and 55 were removed one by one from the scale and the analysis was performed repeatedly (17 times) until the dimensions became clear. After the Varimax orthogonal rotation technique, a total of 17 items were removed from the scale and the total amount of variance explained by the scale was 73.32%. At the same time, the Kaiser Mayer Olkin (KMO) value of the scale was found to be .982, and the Barlett Test of Sphericity test at $p < .001$ level ($x2 = 17719.70$; $df = 703$). The factor (subdimension) number of the scale was determined as 4.

Table 6. The Number of Factors of the Scale After Varimax Orthogonal Rotation Technique

| Factors | Initial Eigenvalues | | | Total Factor Loads | | | Rotated Totals of the Factor Loads | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Variance % | Set % | Total | Variance % | Set % | Total | Variance % | Set % |
| 1 | 24.460 | 64.369 | 64.369 | 24.460 | 64.369 | 64.369 | 8.800 | 23.158 | 23.158 |
| 2 | 1.296 | 3.409 | 67.778 | 1.296 | 3.409 | 67.778 | 7.073 | 18.613 | 41.771 |
| 3 | 1.098 | 2.891 | 70.669 | 1.098 | 2.891 | 70.669 | 7.049 | 18.549 | 60.320 |
| 4 | 1.008 | 2.652 | 73.320 | 1.008 | 2.652 | 73.320 | 4.940 | 13.000 | **73.320** |
| 5 | .690 | 1.816 | 75.136 | | | | | | |
| 6 | .678 | 1.784 | 76.920 | | | | | | |
| 7 | .575 | 1.514 | 78.434 | | | | | | |
| 8 | .537 | 1.413 | 79.847 | | | | | | |
| 9 | .472 | 1.242 | 81.089 | | | | | | |
| 10 | .464 | 1.220 | 82.309 | | | | | | |

* Factor Method: Princ. Comp. Analysis
**Rotat. Method: Varimax

Table 7. The Clarifying Factors of the Post-Varimax EC Scale and the Load Values of These Factors

| Items | Factors | | | |
|---|---|---|---|---|
| | Fact. 1 | Fact. 2 | Fact. 3 | Fact. 4 |
| 30)He/she has a curiosity about creating new values. | .750 | | | |
| 34)He/she is committed to his/her goals. | .718 | | | |
| 33)He/she is aware of his/her competencies. | .677 | | | |
| 47)He/she realizes his/her ideas. | .669 | | | |
| 31)He/she is willing to learn. | .669 | | | |
| 35)He/she continues a job he/she undertakes. | .624 | | | |
| 38)The desire for high success is reflected in his/her behavior. | .610 | | | |
| 48)He/she develops alternative projects. | .597 | | | |
| 54)When he/she detects opportunities, he/she uses them without hesitation. | .592 | | | |
| 45)He/she manages his/her time effectively. | .586 | | | |
| 32)He/she updates himself/herself. | .583 | | | |
| 36)He/she allocates resources while starting a new job. | .562 | | | |
| 41)He/she has high energy. | .562 | | | |
| 20)He/she takes into account the possibilities before starting a business. | .523 | | | |
| 2)He/she can revise old applications and present them in a new format. | | .764 | | |
| 1)He/she follows up opportunities regarding the development of the institution. | | .722 | | |
| 4)He/she activates the institution towards a new target. | | .678 | | |
| 3)He/she supports the discovery processes of the employees. | | .613 | | |
| 8)He/she is the person who initiates change in the organization. | | .600 | | |
| 13)He/she likes to research. | | .599 | | |
| 14)He/she does not miss opportunities that arise for the improvement of institutional practices. | | .588 | | |
| 10)He/she can bring together different resources belonging to the institution and reveal them in a useful way. | | .582 | | |
| 12)He/she has a dynamic vision. | | .578 | | |
| 15)He/she likes to present innovation. | | .565 | | |
| 16)He/she creates new values out of existing resources. | | .538 | | |
| 9)He/she supports the diversity of ideas. | | | .729 | |
| 7)He/she creates an environment in the institution where people can present their ideas without hesitation. | | | .717 | |
| 44)He/she is open to new ideas. | | | .697 | |
| 49)He/she supports good practices produced by employees. | | | .696 | |
| 29)He/she cooperates with employees in achieving goals. | | | .685 | |
| 50)He/she cares about employee participation in achieving a job. | | | .650 | |
| 27)He/she uses communication processes well. | | | .574 | |
| 28)He/she analyzes the requirements of the environment well. | | | .571 | |
| 11)He/she takes risks. | | | | .729 |
| 42)He/she is not afraid of failure. | | | | .662 |
| 25)He/she makes independent decisions. | | | | .660 |
| 18)He/she takes initiative. | | | | .607 |
| 51)He/she does not hesitate to start a new project even if the resources are not provided. | | | | .579 |

* Factor Method: Princ. Comp. Analysis
**Rotat. Method: Varimax

As seen in Tables 6 and 7 above, it is possible to observe that the items of the scale were collected in 4 factors with an eigen value greater than 1. The scale items were determined to have acceptable load values (lowest .523, highest .764) in the factors they entered. After examining the items in the factors, factors (dimensions) were named by considering the majority of items entering the factors within the framework of the relevant literature. The factor names, item numbers, numbers, and the studies used in naming the factors are shown in Table 8 below;

Table 8. Characteristics of EC Scale

| Factor (Subdimension) | Factor (Subdimension) Name | Number of Items | Item Numbers | Studies Used in Naming the Factors (Subdimensions) |
|---|---|---|---|---|
| 1 | Personal Competencies (IC) | 14 | 20, 30, 31, 32, 33, 34, 35, 36, 38, 41, 45, 47, 48, 54 | Dollinger (2008)<br>Van der Kuip (1998)<br>Bueno, Leite & Pilatti (2004)<br>Dornelas (2008)<br>Najim et.al. (2013)<br>McClelland (1961)<br>Zimmerer & Scarborough (1996)<br>Bhatt (2016)<br>Kuratko & Hodgetts (1998) |
| 2 | Organizational Competencies (OC) | 11 | 1, 2, 3, 4, 8, 10, 12, 13, 14, 15, 16 | Dollinger (2008)<br>Onstenk (2003)<br>Najim et.al. (2013)<br>Kuratko & Hodgetts (1998) |
| 3 | Relational Competencies (RC) | 8 | 7, 9, 27, 28, 29, 44, 49, 50 | Minello, Scherer &Alves (2014)<br>Gibb (1998) & Tolentino (1998)<br>Najim et.al. (2013)<br>Bhatt (2016) |
| 4 | Commitment Self-Confidence Competencies (CSCC) | 5 | 11, 18, 25, 42, 51 | Minello, Scherer &Alves (2014)<br>Van der Kuip (1998)<br>Mintzberg (1990) & Kets de Vries (1993)<br>Dornelas (2008)<br>Bhatt (2016)<br>Najim et.al. (2013)<br>Zimmerer & Scarborough, 1996<br>McClelland (1961)<br>Kuratko & Hodgetts (1998)<br>İşcan & Kaygın (2011)<br>Ağca (2004)<br>Caird (1991) |

As seen in Table 8, the first subdimension of the scale consists of 14 items, the second subdimension has 11 items, the third subdimension consists of 8 items, and the fourth subdimension consists of 5 items. The scale consists of 38 items in total. The variables (items) loading the determined scale factors were examined and the subdimensions were named by determining the common points between the variables (Altunışık et al., 2010). In other words, the basic dimension that combines the variable (item) group loaded on the factors was taken into account in naming the factors (Tabachnick & Fidell, 2015). For this purpose, the first subdimension of the scale was named as *"Personal Competencies"*, the second subdimension as *"Organizational Competencies"*, the third subdimension as *"Relational Competencies"*, and the fourth subdimension as *"Commitment-Self-Confidence Competencies"*.

**Reliability Analyses**

Split-half and Cronbach's Alpha (CA) methods were used to reveal the reliability levels and reliability coefficients of the scale and its subdimensions obtained after EFA. CA is the most used reliability determination method and calculates under the consistency between scale items. In the splitting test method, the scale items are divided into two halves and the correlation between these two halves is calculated, and then the resulting correlation coefficient is applied to the correction formula to obtain the reliability coefficient of the whole scale (Şeker & Gençdoğan, 2014; Kan, 2009). The values obtained are shown in Table 9 below;

Table 9 Calculated Reliability Coefficients of Post EFA Scale and Its Subdimensions

| EC Scale and Its Subdimensions | Cronbach's Alpha Coefficient | Split Half Spearman-Brown Coefficient | Split Half Guttman Coefficient |
|---|---|---|---|
| Personal Competencies (PC) | .96 | .95 | .95 |
| Organizational Competencies (OC) | .96 | .94 | .94 |
| Relational Competencies (RC) | .95 | .93 | .93 |
| Commitment Self-Confidence Competencies (CSCC) | .88 | .85 | .80 |
| EC Scale Total | .98 | .96 | .96 |

As seen in Table 9, the reliability analyses of the scale total and subdimensions performed after EFA reveal that the Cronbach's Alpha Value, which was performed to determine the internal consistency reliability, ranged from the lowest α = .88 and the highest α = .98. In the Split Half method, which is a reliability analysis for halving the scale and its subdimensions and determining the consistency between two halves, Spearman-Brown Coefficient was observed to vary between the lowest S = .85 and the highest S = .96, and the Guttman Coefficient was observed to vary between the lowest G = .80 and the highest G = .96. According to Livingston (2018), a reliability coefficient is an absolute number that can vary between .00 and 1.00. The value of 1.00 indicates the perfect consistency, and the closer it gets to the .00 value, the consistency and reliability disappear. The lowest reliability coefficient suggested in the literature is .70 (Fraenkel & Wallen, 1993; Şeker & Gençdoğan, 2014). The high-reliability coefficient values of the scale obtained prove that the reliability and internal consistency of the scale and its subdimensions are high (Price & Mueller, 1986; Nunnally, 1978 as cited in Germain, 2006).

**Discriminant Analysis**

After the reliability analyses, the Independent Groups t-test was used to calculate the discrimination of the scale, its subdimensions, and scale items. In this direction, using the scale and subdimension total scores and item scores, the upper 27%, and the lower 27% segments were determined, and whether the differences of arithmetic means between these groups was significant and if it was significant, it was calculated whether it was in favor of the upper group. Discrimination is comparing high and low scorers of an item or scale, and the ability to distinguish between the high and low score in a particular feature. A ratio of 27% is generally considered sufficient to separate upper and lower groups because this value provides a sufficient rate for the analysis of discrimination, while at the same time maximizing the differences in normal distributions (McCowan & McCowan, 1999; Wiersma & Jurs, 1990).

Table 10. Independent Group t-test Conducted to Reveal the Discrimination of the EC Scale and its Subdimensions

| Subdimensions | Groups | $N$ | $\bar{x}$ | $ss$ | $Sh_{\bar{x}}$ | $t$ | $t$ test Df | $p$ |
|---|---|---|---|---|---|---|---|---|
| Personal Competencies (PC) | Upper | 118 | 64.03 | 3.96 | .36 | 35.986 | 172.15 | .000 |
| | Lower | 118 | 34.71 | 7.91 | .73 | | | |
| Organizational Competencies (OC) | Upper | 118 | 50.14 | 3.194 | .29 | 35.371 | 165.92 | .000 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Lower | 118 | 25.60 | 6.824 | .63 | | | |
| Relational Competencies (RC) | Upper | 118 | 36.92 | 2.035 | .19 | 37.381 | 155.32 | .000 |
| | Lower | 118 | 18.48 | 4.957 | .45 | | | |
| Commitment Self-Confidence Competencies (CSCC) | Upper | 118 | 21.57 | 1.727 | .16 | 42.542 | 209.91 | .000 |
| | Lower | 118 | 9.81 | 2.457 | .22 | | | |
| EC Scale Total | Upper | 118 | 170.37 | 10.261 | .94 | 38.833 | 175.24 | .000 |
| | Lower | 118 | 90.42 | 19.874 | 1.83 | | | |

Table 11. Independent Group t-test Conducted to Reveal the Discrimination of the EC Scale Items

| Items | Groups | N | $\overline{X}$ | t | Df | p |
|---|---|---|---|---|---|---|
| 1 | Upper | 118 | 4.84 | 32.260 | 175 | .000 |
| | Lower | 118 | 2.46 | | | |
| 2 | Upper | 118 | 4.46 | 28.901 | 234 | .000 |
| | Lower | 118 | 2.14 | | | |
| 3 | Upper | 118 | 4.75 | 33.781 | 194 | .000 |
| | Lower | 118 | 2.19 | | | |
| 4 | Upper | 118 | 4.75 | 31.628 | 196 | .000 |
| | Lower | 118 | 2.38 | | | |
| 7 | Upper | 118 | 4.92 | 38.863 | 150 | .000 |
| | Lower | 118 | 2.12 | | | |
| 8 | Upper | 118 | 4.45 | 35.915 | 234 | .000 |
| | Lower | 118 | 1.85 | | | |
| 9 | Upper | 118 | 4.59 | 33.794 | 234 | .000 |
| | Lower | 118 | 1.94 | | | |
| 10 | Upper | 118 | 4.57 | 29.896 | 209 | .000 |
| | Lower | 118 | 2.18 | | | |
| 11 | Upper | 118 | 4.44 | 44.896 | 234 | .000 |
| | Lower | 118 | 1.52 | | | |
| 12 | Upper | 118 | 4.52 | 36.057 | 234 | .000 |
| | Lower | 118 | 1.80 | | | |
| 13 | Upper | 118 | 4.53 | 31.152 | 234 | .000 |
| | Lower | 118 | 2.05 | | | |
| 14 | Upper | 118 | 4.76 | 30.045 | 181 | .000 |
| | Lower | 118 | 2.31 | | | |
| 15 | Upper | 118 | 4.78 | 32.850 | 186 | .000 |
| | Lower | 118 | 2.25 | | | |
| 16 | Upper | 118 | 4.65 | 32.035 | 203 | .000 |
| | Lower | 118 | 2.10 | | | |
| 18 | Upper | 118 | 4.63 | 47.412 | 234 | .000 |
| | Lower | 118 | 1.66 | | | |
| 20 | Upper | 118 | 4.57 | 28.687 | 205 | .000 |
| | Lower | 118 | 2.23 | | | |
| 25 | Upper | 118 | 4.40 | 43.665 | 231 | .000 |
| | Lower | 118 | 1.73 | | | |
| 27 | Upper | 118 | 4.61 | 32.685 | 199 | .000 |
| | Lower | 118 | 1.89 | | | |
| 28 | Upper | 118 | 4.58 | 30.953 | 234 | .000 |
| | Lower | 118 | 2.01 | | | |
| 29 | Upper | 118 | 4.72 | 31.851 | 191 | .000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Lower | 118 | 2.14 | | | |
| 30 | Upper | 118 | 4.74 | 31.243 | 204 | .000 |
| | Lower | 118 | 2.45 | | | |
| 31 | Upper | 118 | 4.84 | 33.362 | 173 | .000 |
| | Lower | 118 | 2.33 | | | |
| 32 | Upper | 118 | 4.66 | 32.576 | 206 | .000 |
| | Lower | 118 | 2.13 | | | |
| 33 | Upper | 118 | 4.75 | 29.537 | 183 | .000 |
| | Lower | 118 | 2.34 | | | |
| 34 | Upper | 118 | 4.79 | 30.302 | 185 | .000 |
| | Lower | 118 | 2.47 | | | |
| 35 | Upper | 118 | 4.86 | 32.217 | 168 | .000 |
| | Lower | 118 | 2.52 | | | |
| 36 | Upper | 118 | 4.59 | 28.093 | 205 | .000 |
| | Lower | 118 | 2.32 | | | |
| 38 | Upper | 118 | 4.68 | 31.945 | 201 | .000 |
| | Lower | 118 | 2.16 | | | |
| 41 | Upper | 118 | 4.69 | 36.558 | 234 | .000 |
| | Lower | 118 | 1.92 | | | |
| 42 | Upper | 118 | 4.38 | 43.548 | 234 | .000 |
| | Lower | 118 | 1.61 | | | |
| 44 | Upper | 118 | 4.65 | 31.328 | 199 | .000 |
| | Lower | 118 | 2.10 | | | |
| 45 | Upper | 118 | 4.46 | 28.187 | 204 | .000 |
| | Lower | 118 | 2.13 | | | |
| 47 | Upper | 118 | 4.60 | 27.307 | 213 | .000 |
| | Lower | 118 | 2.50 | | | |
| 48 | Upper | 118 | 4.49 | 30.589 | 234 | .000 |
| | Lower | 118 | 2.10 | | | |
| 49 | Upper | 118 | 4.97 | 36.862 | 127 | .000 |
| | Lower | 118 | 2.33 | | | |
| 50 | Upper | 118 | 4.89 | 33.750 | 158 | .000 |
| | Lower | 118 | 2.42 | | | |
| 51 | Upper | 118 | 4.42 | 38.049 | 234 | .000 |
| | Lower | 118 | 1.81 | | | |
| 54 | Upper | 118 | 4.56 | 28.389 | 210 | .000 |
| | Lower | 118 | 2.30 | | | |

As seen in Tables 10 and 11, a significant difference in favor of the upper group ($p < .001$) was found between the EC scale and subdimension scores and the arithmetic means of the lower 27% and upper 27% of the item scores of the scale, thus, observations exhibited that the scale, its subdimensions and the items of the scale were discriminants. The significant difference between the lower and upper group means shows that the internal consistency of the scale is also high (Büyüköztürk, 2012).

**Correlation Calculations**

After the discrimination process, item-total (IT) and remaining item (IR) correlations of the items of the SC scale were calculated, and the results revealed the internal consistency of the scale and whether the items measure the same structure.

Table 12. EC Scale IT and IR Correlation Results

| | Item-Total Correlation | | | Item-Remainder Correlation | |
|---|---|---|---|---|---|
| Items | N | r | p | r | p |
| 1 | 436 | .804 | .000 | .793 | .000 |
| 2 | 436 | .705 | .000 | .688 | .000 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 436 | .806 | .000 | .794 | .000 |
| 4 | 436 | .834 | .000 | .825 | .000 |
| 7 | 436 | .732 | .000 | .715 | .000 |
| 8 | 436 | .846 | .000 | .836 | .000 |
| 9 | 436 | .789 | .000 | .776 | .000 |
| 10 | 436 | .864 | .000 | .855 | .000 |
| 11 | 436 | .733 | .000 | .715 | .000 |
| 12 | 436 | .884 | .000 | .875 | .000 |
| 13 | 436 | .832 | .000 | .821 | .000 |
| 14 | 436 | .853 | .000 | .844 | .000 |
| 15 | 436 | .843 | .000 | .833 | .000 |
| 16 | 436 | .871 | .000 | .862 | .000 |
| 18 | 436 | .787 | .000 | .772 | .000 |
| 20 | 436 | .743 | .000 | .729 | .000 |
| 25 | 436 | .624 | .000 | .603 | .000 |
| 27 | 436 | .805 | .000 | .791 | .000 |
| 28 | 436 | .832 | .000 | .821 | .000 |
| 29 | 436 | .821 | .000 | .809 | .000 |
| 30 | 436 | .704 | .000 | .688 | .000 |
| 31 | 436 | .845 | .000 | .836 | .000 |
| 32 | 436 | .845 | .000 | .835 | .000 |
| 33 | 436 | .810 | .000 | .799 | .000 |
| 34 | 436 | .796 | .000 | .784 | .000 |
| 35 | 436 | .799 | .000 | .788 | .000 |
| 36 | 436 | .843 | .000 | .834 | .000 |
| 38 | 436 | .788 | .000 | .775 | .000 |
| 41 | 436 | .825 | .000 | .813 | .000 |
| 42 | 436 | .689 | .000 | .670 | .000 |
| 44 | 436 | .826 | .000 | .815 | .000 |
| 45 | 436 | .829 | .000 | .819 | .000 |
| 47 | 436 | .793 | .000 | .783 | .000 |
| 48 | 436 | .851 | .000 | .842 | .000 |
| 49 | 436 | .793 | .000 | .781 | .000 |
| 50 | 436 | .787 | .000 | .774 | .000 |
| 51 | 436 | .745 | .000 | .730 | .000 |
| 54 | 436 | .833 | .000 | .823 | .000 |

As seen in Table 12, the correlation values obtained as a result of item-total correlation (lowest .624; highest .884) and item-remainder correlation (lowest .603; highest .875) were above .30 and a positive significant relationship was determined at the $p < .001$ level. All these results show that the internal consistency of the scale is high and it measures the same structure (Büyüköztürk, 2012; Gürbüz & Şahin, 2018). After this process, Pearson Analysis was performed to reveal the relationships between the scale and subdimensions and between the subdimensions themselves. Analysis results shows the strength and severity of the relationship between two variables, it is represented by "r" and takes values between -1 and +1 (Altunışık et al., 2010). If the coefficient obtained after the correlation calculations between variables is lower than .30, the relationship between variables is described as weak, if it is between .30-.70, the relationship between variables as a medium, and if it is .70 and above, the relationship between variables as strong in the literature (Gürbüz & Şahin, 2018).

Table 13. Pearson Analysis Performed to Reveal the Relationships Between the EC Scale and the Subdimensions and Between the Subdimensions themselves

| The Scale and Subdimensions | | Organizational Competencies (OC) | Relational Competencies (RC) | Commitment Self-Confidence Competencies (CSCC) | Entrepreneurship Competencies Total |
|---|---|---|---|---|---|
| Personal | r | .896 | .860 | .812 | .967 |
| | p | .000 | .000 | .000 | .000 |

| | | | | |
|---|---|---|---|---|
| Competencies (PC) | | | | |
| Organizational Competencies (OC) | r | .857 | .804 | .959 |
| | p | .000 | .000 | .000 |
| Relational Competencies (RC) | r | | .766 | .929 |
| | p | | .000 | .000 |
| Commitment Self-Confidence Competencies (CSCC) | r | | | .875 |
| | p | | | .000 |

As seen in Table 13, as a result of the Pearson Analysis, a high positive relationship was found between both sub-factors and between sub-factors and the total score of the scale. A positive significant relationship was found between the *"EC Scale"* and *"Personal Competencies"* subdimension with r = .967 at p <.001 level, between the *"EC Scale"* and the *"Organizational Competencies"* subdimension with r = .959 at p <.001 level, between the *"EC Scale"* and the *"Relational Competencies"* subdimension with r = .929 at p <.001 level, and between the *"EC Scale"* and the *"Commitment-Self-Confidence Competencies"* subdimension with r = .875 at p <.001 level. Nevertheless, a positive significant relationship was found between the *"Personal Competencies"* subdimension and the *"Organizational Competencies"* subdimension with r = .896 at p <.001 level, between the *"Personal Competencies"* subdimension and the *"Relational Competencies"* subdimension with r = .860 at p <.001 level, between the *"Personal Competencies"* subdimension and the *"Commitment-Self-Confidence Competencies"* subdimension with r = .812 at p <.001 level, between the *"Organizational Competencies"* subdimension and the *"Relational Competencies"* subdimension with r = .857 at p <.001 level, between the *"Organizational Competencies"* subdimension and the *"Commitment-Self-Confidence Competencies"* subdimension with r = .804 at p <.001 level, and between the *"Relational Competencies"* subdimension and the *"Commitment-Self-Confidence Competencies"* subdimension with r = .766 at p <.001. All these results show that all factors of the EC scale measure the same structure and that all factors have a positive correlation between themselves and with the total score of the scale.

After the above procedures regarding the EC scale, the items of the scale were reordered. The new and old item numbers of the scale are shown below;

Table 14. EC Scale New and Old Item Numbers Before the Second Application and CFA

| | | | Subdimensions | | | |
|---|---|---|---|---|---|---|
| | | | PC | OC | RC | CSCC |
| New Item Number | Old Item Number | Items | | | | |
| 1 | 30 | He/she has a curiosity about creating new values. | .750 | | | |
| 2 | 34 | He/she is committed to his/her goals. | .718 | | | |
| 3 | 33 | He/she is aware of his/her competencies. | .677 | | | |
| 4 | 47 | He/she realizes his/her ideas. | .669 | | | |
| 5 | 31 | He/she is willing to learn. | .669 | | | |
| 6 | 35 | He/she continues a job he/she undertakes. | .624 | | | |
| 7 | 38 | The desire for high success is reflected in his/her behavior. | .610 | | | |
| 8 | 48 | He/she develops alternative projects. | .597 | | | |
| 9 | 54 | When he/she detects opportunities, he/she uses them without hesitation. | .592 | | | |
| 10 | 45 | He/she manages his/her time effectively. | .586 | | | |
| 11 | 32 | He/she updates himself/herself. | .583 | | | |
| 12 | 36 | He/she allocates resources while starting a new job. | .562 | | | |
| 13 | 41 | He/she has high energy. | .562 | | | |
| 14 | 20 | He/she takes into account the possibilities before starting a business. | .523 | | | |

| | | | | | |
|---|---|---|---|---|---|
| 15 | 2 | He/she can revise old applications and present them in a new format. | .764 | | |
| 16 | 1 | He/she follows up opportunities regarding the development of the institution. | .722 | | |
| 17 | 4 | He/she activates the institution towards a new target. | .678 | | |
| 18 | 3 | He/she supports the discovery processes of the employees. | .613 | | |
| 19 | 8 | He/she is the person who initiates change in the organization. | .600 | | |
| 20 | 13 | He/she likes to research. | .599 | | |
| 21 | 14 | He/she does not miss opportunities that arise for the improvement of institutional practices. | .588 | | |
| 22 | 10 | He/she can bring together different resources belonging to the institution and reveal them in a useful way. | .582 | | |
| 23 | 12 | He/she has a dynamic vision. | .578 | | |
| 24 | 15 | He/she likes to present innovation. | .565 | | |
| 25 | 16 | He/she creates new values out of existing resources. | .538 | | |
| 26 | 9 | He/she supports the diversity of ideas. | | .729 | |
| 27 | 7 | He/she creates an environment in the institution where people can present their ideas without hesitation. | | .717 | |
| 28 | 44 | He/she is open to new ideas. | | .697 | |
| 29 | 49 | He/she supports good practices produced by employees. | | .696 | |
| 30 | 29 | He/she cooperates with employees in achieving goals. | | .685 | |
| 31 | 50 | He/she cares about employee participation in achieving a job. | | .650 | |
| 32 | 27 | He/she uses communication processes well. | | .574 | |
| 33 | 28 | He/she analyzes the requirements of the environment well. | | .571 | |
| 34 | 11 | He/she takes risks. | | | .729 |
| 35 | 42 | He/she is not afraid of failure. | | | .662 |
| 36 | 25 | He/she makes independent decisions. | | | .660 |
| 37 | 18 | He/she takes initiative. | | | .607 |
| 38 | 51 | He/she does not hesitate to start a new project even if the resources are not provided. | | | .579 |

**Confirmatory Factor Analysis (CFA)**

After EFA and reliability analyses, CFA was performed to reveal whether the scale model and model-data fit were verified. The data obtained in the practice carried out in a sample of 724 teachers were first transferred to the SPSS 21 system and the Skewness-Kurtosis values of the data set were examined to reveal whether the data set showed normal distribution (univariate normality assumption). The fact that the "Skewness-Kurtosis" values of the data set are in the range of +2 and -2 indicates that they meet the normality assumption. Observations revealed that the calculated Skewness *(-.827)* and Kurtosis *(.703)* values of the scale were within the specified range, so the assumption that the data set showed a normal distribution was confirmed (George & Mallery, 2010; Tabachnick & Fidell, 2015). Then, the application of CFA was performed using the Lisrel program. In CFA, the status of representation of the variables of the scale in the factors they enter is revealed and verified, at the same time, the researcher determines the distribution of the variables to the factors in the creation of the model (Özdamar, 2004; Albright & Park, 2009). However, CFA is a data reduction technique that evaluates the relationships between several variables. Depending on the results in the CFA process, that is, if the model is not verified, it may be necessary to take a new sample and perform an EFA again, or interventions such as item deletion or revision in measurement may take place (Germain, 2006). As a result, the general purpose of EFA and CFA is to ensure the stability of the factor structure (Hinkin, 1995). For this purpose, the relevant data were transferred to the Lisrel program and the model of the scale was determined by the researcher, and items (variables) were assigned to the model. Then, the model was calculated and the fit values of the model were revealed. In Table 15 below, item statistics obtained from the items in the scale as a result of the CFA analysis performed for the EC scale are given.

Table 15. CFA Item Statistics

| Factor | Item No | Factor Load Value | $R^2$ | Error | t |
|---|---|---|---|---|---|
| Personal Competencies (PC) | 1 | .85 | .73 | 0.27 | 24.17** |
| | 2 | .83 | .69 | 0.31 | 32.59** |
| | 3 | .81 | .66 | 0.34 | 31.53** |
| | 4 | .81 | .65 | 0.35 | 31.31** |
| | 5 | .86 | .74 | 0.26 | 34.59** |
| | 6 | .84 | .70 | 0.30 | 33.15** |
| | 7 | .85 | .71 | 0.29 | 33.63** |
| | 8 | .89 | .78 | 0.22 | 36.25** |
| | 9 | .84 | .71 | 0.29 | 33.54** |
| | 10 | .84 | .70 | 0.30 | 33.17** |
| | 11 | .90 | .81 | 0.19 | 37.38** |
| | 12 | .82 | .69 | 0.31 | 32.68** |
| | 13 | .86 | .75 | 0.25 | 34.83** |
| | 14 | .80 | .64 | 0.36 | 30.92** |
| Organizational Competencies (OC) | 15 | .87 | .75 | 0.25 | 34.97** |
| | 16 | .86 | .73 | 0.27 | 34.35** |
| | 17 | .89 | .78 | 0.22 | 36.24** |
| | 18 | .88 | .77 | 0.23 | 35.83** |
| | 19 | .87 | .75 | 0.25 | 34.96** |
| | 20 | .89 | .79 | 0.21 | 36.38** |
| | 21 | .88 | .77 | 0.23 | 32.18** |
| | 22 | .89 | .78 | 0.22 | 36.28** |
| | 23 | .91 | .83 | 0.17 | 38.28** |
| | 24 | .91 | .82 | 0.18 | 37.67** |
| | 25 | .91 | .82 | 0.18 | 37.62** |
| Relational Competencies (RC) | 26 | .85 | .73 | 0.27 | 33.71** |
| | 27 | .84 | .71 | 0.29 | 33.04** |
| | 28 | .89 | .78 | 0.22 | 35.93** |
| | 29 | .88 | .78 | 0.22 | 35.85** |
| | 30 | .90 | .81 | 0.19 | 37.03** |
| | 31 | .88 | .77 | 0.23 | 35.37** |
| | 32 | .84 | .71 | 0.29 | 33.31** |
| | 33 | .86 | .74 | 0.26 | 34.10** |
| Commitment Self-Confidence Competencies (CSCC) | 34 | .88 | .77 | 0.23 | 35.19** |
| | 35 | .81 | .66 | 0.34 | 31.02** |
| | 36 | .63 | .40 | 0.60 | 21.87** |
| | 37 | .84 | .71 | 0.29 | 32.83** |
| | 38 | .82 | .68 | 0.32 | 31.76** |

**p<0.01

As seen in Table 15, according to the CFA results of the Entrepreneurship Competencies Scale, the factor load values of the scale items vary between .63 and .91. The factor load values obtained are at an acceptable level. Also, the relationships between scale items and latent variables were determined to be statistically significant at a 99% confidence interval (t> 2.58). The path diagram of CFA is presented below:

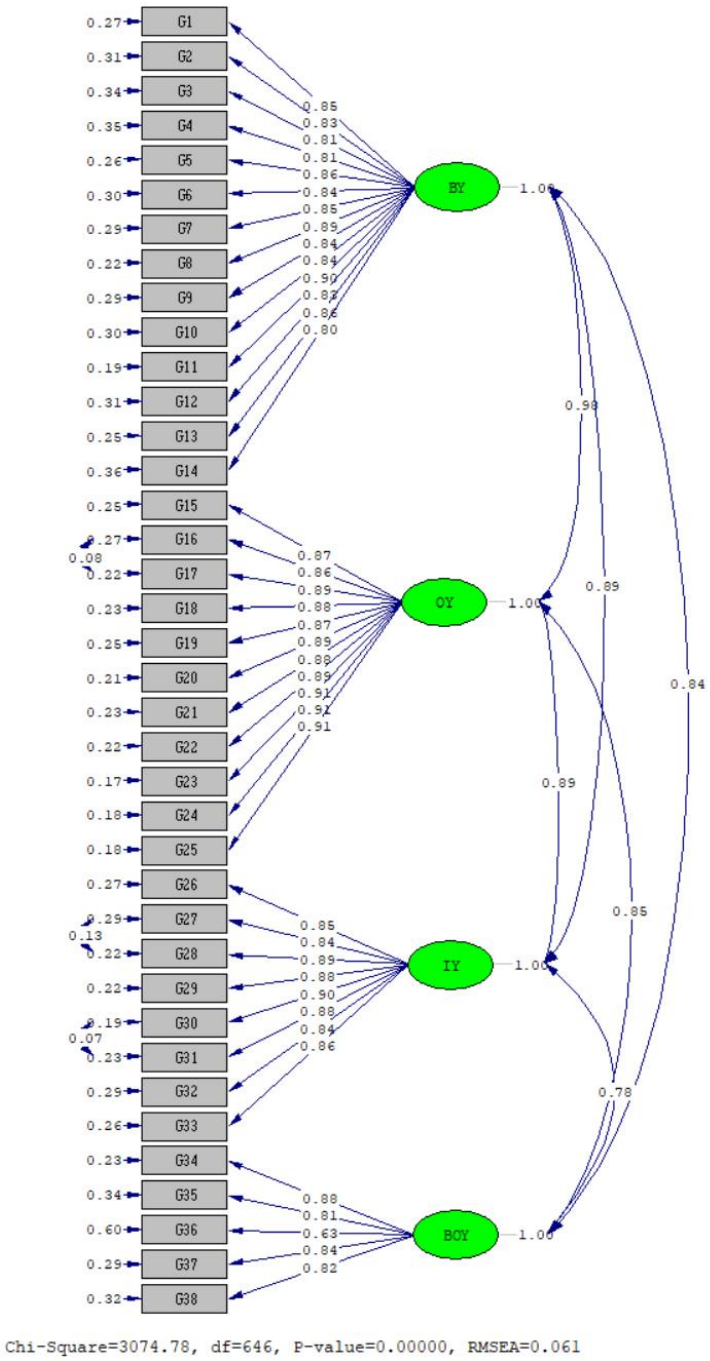


Figure 1. EC Scale CFA Model

As seen in Figure 1, the CFA model of the EC scale has been presented as a four-factor structure. PC represents the "Personal Competencies" subdimension, OC represents the "Organizational Competencies" subdimension, RC represents the "Relational Competencies" subdimension, and CSCC represents the "Commitment-Self-Confidence Competencies" subdimension. When looking at the path diagram obtained after CFA analysis of the EC scale model, at the first stage, the fit criteria did not come out at the desired level, so modifications, which are suggested by the program, were made between items 16-17, 27-28 and 30-31. The goodness of fit values calculated after the CFA application are presented below:

Table 16. EC Scale Goodness of Fit Values

| $X^2$/df | p | RMSEA | GFI | CFI | AGFI | NNFI | NFI | SRMR | RMR |
|---|---|---|---|---|---|---|---|---|---|
| 4.759 | 0.000 | .061 | .91 | .99 | .86 | .99 | .99 | .023 | .025 |

As seen in Table 16, the chi-square value calculated as a result of the CFA of the EC scale model was found as $x^2$ = 3074.78, degree of freedom as df = 646 (p <.001), and chi-square/df value as 4.759. A value of $x^2$/sd below 5 indicates that the model fit is at an acceptable level (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Looking at the results of fit indexes, the RMSEA value was calculated as .061, CFI value as .99, NFI value as .99, GFI value as .91, and the RMR value as .025. The facts that the RMSEA value is below .08, the GFI value is .90 and above, the RMR value is below .1, the CFI value is .90 and above, and the NFI value is .90 and above reveal that the model is compatible with the real data and all fit indexes have acceptable or perfect values (Rigdon, 1996; Erkorkmaz, Etikan, Demir, Özdamar, & Sanisoğlu, 2013; Hu & Bentler, 1999; Schermelleh-Engel et al., 2003; Bentler & Bonnet, 1980; Byrne, 2011; Yaşlıoğlu, 2017; Çokluk, Şekercioğlu & Büyüköztürk, 2010; Plichta & Kelvin, 2013).

**The Scoring of the Scale**

The Entrepreneurial Competencies Scale is structured as a five point Likert type, and the "Strongly Disagree" option is 1 point, the "Disagree" option is 2 points, the "Partially Agree" option is 3 points, the "Agree" option is 4 points, and "Strongly Agree" option is 5 points. As the total score of the scale increases, the assumed "Entrepreneurial Competencies" feature also increases. There is no reverse item on the scale. The lowest 14 and highest 70 points can be obtained from the "Personal Competencies" subdimension of the scale, the lowest 11 points, and highest 55 points can be obtained in the "Organizational Competencies" subdimension, the lowest 8 points, and highest 40 points can be obtained in the "Relational Competencies" subdimension, the lowest 5 points, and highest 25 points can be obtained in the "Commitment-Self-Confidence Competencies" subdimension, and the lowest 38 and highest 190 points can be obtained in the "Entrepreneurship Competencies Scale" in general. Regarding the scoring of the Entrepreneurship Competencies scale, the score and decision ranges are as follows:

Table 17. The Scoring of the Entrepreneurship Competencies Scale and Decision Ranges

| | **Strongly Disagree** | **Disagree** | **Partially Agree** | **Agree** | **Strongly Agree** |
|---|---|---|---|---|---|
| When the means of the scoring points are calculated | 1.00-1.8 | 1.9-2.69 | 2.70-3.49 | 3.50-4.29 | 4.30-5.00 |
| When the total point means are calculated | 38-68.4 | 68.5-98.8 | 98.9-129.2 | 129.3-159.6 | 159.7-190 |
| Decision Direction | Entrepreneurship Competencies Decrease ⟵ | | | Entrepreneurship Competencies Increase ⟶ | |

## Discussion and Conclusion

School principals need to have competencies that include entrepreneurship qualities in terms of the development and competition of today's educational institutions. For this reason, the development of a measurement tool that covers and measures these competencies in both the selection of pre-service school leaders and the evaluation of the in-service performance of school leaders guided this research. In this study, which was conducted in line with this orientation, a measurement tool consisting of four subdimensions and 38 items was obtained to develop a scale that has items including entrepreneurship competencies of school principals according to teachers' perceptions. The measurement tool obtained consists of "Personal Competencies" with fourteen items, "Organizational Competencies" with eleven items, "Relational Competencies" with eight items, and Commitment-Self-Confidence Competencies with five items.

During the development phase of the EC Scale, the total variance amount explained by the four factor obtained in the EFA analysis, which was carried out to ensure the structural validity of the scale and to determine the factor structures, was 73.20%. Observations revealed that the factor loading values of the variables (items) that load on the factors were between .523 and .750 in the Personal Competencies subdimension, between .538 and .764 in the Organizational Competencies subdimension, between .571 and .729 in the Relational Competencies subdimension; and between .579 and .729 in the Commitment Self-Confidence Competencies subdimension which are acceptable load values.

In the reliability analysis performed after determining the factor structures of the measurement tool, observations exhibited that CA value at the level of the scale and its subdimensions was between the lowest .88 and the highest .98, the Spearman-Brown Coefficient varied between the lowest .85 and the highest .96 range, the Guttman Coefficient ranged from .80 to the highest .96, and the scale had a high of reliability.

In the discrimination analysis performed after the reliability analysis, observations revealed that there was a significant difference in favor of the upper group ($p < .001$) between the scale and its subdimensions, as well as the upper and lower mean scores of the scale items, and the scale's items and subdimensions had a distinctive structure. After the discrimination analysis, item-total (lowest .624; highest .884) and item-remainder correlations (lowest .603; highest .875) were calculated, and among the items, a highly positive ($p < .001$) significant relationship was detected. After this process, Pearson Analysis was performed to reveal the relationships between the scale and the subdimensions and between the subdimensions themselves, and it was observed that the correlation values ranged from the lowest .766 to .967. All these correlation values show that the scale, its items, and subdimensions are consistent within themselves and have a highly significant relationship with each other.

Finally, CFA was performed to verify the scale model and the obtained fit values ($x2 / df=4.759$; RMSEA = .061; CFI = .99; NFI = .99; GFI = .91; AGFI = .86; RMR =. 025; SRMR = .023) confirmed the scale model and its four-factor structure. All these values obtained prove that the EC scale has a valid and reliable structure.

The four-factor scale structure obtained in this study within the subject area and scope of entrepreneurship competencies matches with various studies and evaluations in the literature. Thus, the personal competencies subdimension has been defined by various researchers (Dollinger, 2008; Van der Kuip, 1998; Bueno, Leite & Pilatti, 2004; Dornelas, 2008; Najim et al., 2013; McClelland, 1961; Zimmerer & Scarborough, 1996; Bhatt, 2016; Kuratko & Hodgetts, 1998) and it includes specificities that contain the character and behavioral qualities that find their expression in individuals' characteristics and distinguish them from others. Organizational competencies subdimension is reflected by the views of Dollinger (2008), Onstenk (2003), Najim et al. (2013), and Kuratko and Hodgetts (1998) and it includes the attitudes that direct the leadership and management processes to entrepreneurship, such as the leader guiding the organization within the framework of his/her vision, ensuring organizational commitment to initiatives, introducing initiatives to ensure change and innovation to the organization, and activating the organization. The Relational Competencies subdimension has been emphasized by the evaluations of Minello, Scherer, Alves (2014), Gibb (1998), Tolentino (1998), Najim et al. (2013), and Bhatt (2016) and it includes cooperation regarding implementation of initiatives and relationship management, participation, communication processes, and diversity of ideas. Commitment-Self-Confidence Competencies are also expressed by various researchers (Minello, Scherer, Alves, 2014; Van der Kuip, 1998; Mintzberg, 1990; Kets de Vries, 1993; Dornelas, 2008; Bhatt, 2016; Najim et al., 2013; Zimmerer & Scarborough, 1996; McClelland, 1961; Kuratko & Hodgetts, 1998; İşcan & Kaygın, 2011; Ağca, 2004; Caird, 1991) and includes taking risk and initiative, self-confidence, not being afraid of failure, perseverance, and determination.

As a result, innovation and change processes in organizations and original productions and value creation start with the initiatives of the organization leaders. The fact that school leaders perceive the opportunities by observing the dynamics within their organizational structure and turning them into initiatives puts these schools in the foreground in educational terms. In this context, school leaders need to acquire these competencies and adopt them in an individual structure to carry out the process with entrepreneurial eyes.

## Recommendations

Although the developed EC scale was developed in the sample and context of school leaders, it has an item character that can be used in different sectors. For this reason, to see the big picture, it is important to use the scale to determine the entrepreneurship competencies of leaders in different professional fields and sectors, as well as to test and adapt the scale in different cultural and regional sampling structures. At the same time, it will

be beneficial for the development of the education system if decision-makers take these competencies into account in the selection and evaluation of school leaders and reflect these competencies to pre-service and in-service training processes.

## References


Ağca, V. (2004). *Intrapreneurship construct and it's effects on the firm performance a survey of the tekstile firms in Denizli* (Unpublished PhD Thesis). Afyon Kocatepe University, Social Sciences Institute, Afyon.

Alberti, F., Sciascia, S., & Poli, A. (2004). Entrepreneurship education: Notes on an ongoing debate. 14th Annual Intent Conference, University of Napoli Federico II Italy, 4-7 July 2004.

Albrıght, J. J., & Park, H. M. (2009). *Confirmatory Factor Analysis Using Amos, LISREL, Mplus, SAS/STAT CALIS*, University Information Technology Services Center for Statistical and Mathematical Computing Indiana University. https://scholarworks.iu.edu/dspace/bitstream/handle/2022/19736/Confirmatory%20Factor%20Analysis%20using%20Amos%2c%20LISREL%2c%20Mplus%2c%20SAS%3aSTAT%20CALIS.pdf?sequence=1&isAllowed=y adresinden edinilmiştir.

Alfırevıc, N., Vıcan, D., Pavıcıc, C., & Petkovıc, S. (2018). Entrepreneurial Orientation of School Principals and Principalship in Croatia and Bosnia & Herzegovina: Psychological, Educational and Social Perspectives. *Rev. soc. polit., 25* (1), 85-97. Doi: 10.3935/rsp.v25i1.1461

Altunışık, R., Coşkun, R., Bayraktaroğlu, S., & Yıldırım, E. (2010). *Sosyal Bilimlerde Araştırma Yöntemleri SPSS Uygulamalı[SPSS Applied Research Methods in Social Sciences]*. Sakarya: Sakarya Yayıncılık.

Armuna, C., Ramos, S., Juan, J., Feijoo, C., & Arenal, A. (2020). From stand-up to start-up: exploring entrepreneurship competences and STEM women's intention. *International Entrepreneurship and Management Journal*, (cilt sayı yok), 1-24.

Ayub, D., & Othman, N. (2013). Entrepreneurship Management Practices in Creating Effective Schools. *Asian Social Science, 9* (12), 69-78.

Bacigalupo, M., Kampylis, P., Punie, Y., & Van den Brande, G. (2016). *EntreComp: The Entrepreneurship Competence Framework*. Luxembourg: Publication Office of the European Union.

Bentler, P. M., & Bonett, D. G. (1980). Significance Tests and Goodness of Fit in The Analysis of Covariance Structures. *Psychological Bulletin, 88*(3), 588-606. Doi: 10.1037/0033-2909.88.3.588

Bhatt, A. K. (2016).*Innovation and Entrepreneurship*. New Delhı: Laxmi Publications.

Blake, B., & Mestry, R. (2014). The changing dimensions of the finances on urban schools: An entrepreneurial approach for principals. *Education as Change*, *18*(1), 163–178. Doi:10.1080/16823206.2013.847017

Büyüköztürk, Ş. (2006). *Sosyal Bilimler İçin Veri Analizi: İstatistik, Araştırma Deseni SPSS Uygulamaları ve Yorum [Data Analysis for Social Sciences: Statistics, Research Design, SPSS Applications and Interpretation]*. Ankara: PegemA Yayıncılık.

Büyüköztürk, Ş. (2012). *Sosyal Bilimler İçin Veri Analizi El Kitabı [Manual Of Data Analysis For Social Sciences]*. Ankara: Pegem Yayınları.

Bygrave, W. D.,& Hofer, C. W. (1992). Theorizing about Entrepreneurship. *Entrepreneurship Theory and Practice*, *16*(2), 13–22. Doi: 10.1177/104225879201600203

Byrne, B. M. (2011). *Structural Equation Modeling with AMOS Basic Concepts, Applications, and Programming (Multivariate Applications Series)*, Routledge, New York.

Caird, S. (1991). Research note: The enterprising tendency of occupational groups. *International Small Business Journal*, *9*(4), 75–181.

Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, *13*(4), 295–316. Doi: 10.1016/S0883-9026(97)00029-3

Clark, L. A., & Watson, D. (1995). Constructing Validity: Basic Issues in Objective Scale Development. *Psychological Assessment*, 7(3), 309-319. Doi:10.1037/1040-3590.7.3.309

Currie, G., Humphreys, M., Ucbasaran, D., & McManus, S. (2008). Entrepreneurial leadership in the English public sector: Paradox or possibility? *Public Administration, 86*(4), 987-1008. Doi: 10.1111/j.1467-9299.2008.00736.x

Çokluk, Ö., Şekercioğlu, G., & Büyüköztürk, Ş. (2010). *Sosyal Bilimler İçin Çok Değişkenli İstatistik SPSS ve LISREL Uygulamaları [SPSS and LISREL Applications Multivariate Statistics for Social Sciences]*. Ankara: Pegem Akademi Yayıncılık.

Dollinger, M. J. (2008). *Entrepreneurshıp: Strategies and Resources*. Illinois: Marsh Publıcatıons.

Dornelas, J. C. A. (2008). *Empreendedorismo: transformando idéias em negócios [Entrepreneurship: turning ideas into business]*. Rio de Janeiro: Elsevier.

Drucker, P. F. (1985).*Innovation and Entrepreneurship: Practice and Principles*. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. Available at SSRN: https://ssrn.com/abstract=1496169.

Du Toit, C. M. (1990). *Fundamental business economics*. Durban: Butterworths.

Erkorkmaz, Ü., Etikan, İ., Demir, O., Özdamar, K. ve Sanisoğlu, S. Y. (2013). Doğrulayıcı Faktör Analizi ve Uyum İndeksleri [Confirmatory Factor Analysis and Fit Indices]. *Turkiye Klinikleri, 33* (1), 210-223. Doi: 10.5336/medsci.2011-26747

Fernald, L., Solomon, G.T. & Tarabishy, A. (2005). A new paradigm: entrepreneurial leadership. *Southern Business Review, 30*(2), 1–10.

Field, A. (2009). *Discovering Statistics Using SPSS: Introducing Statistical Method*. Thousand Oaks, CA: Sage Publications.

Fraenkel, J. R., & Wallen, N. E. (1993*). How to Design And Evaluate Research İn Education*. Boston, MA: McGraw Hill.

George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update*. Boston: Pearson.

Germain, M. L. (2006). Stages of Psychometric Measure Development: The example of the Generalized Expertise Measure (GEM). *Online Submission*. https://files.eric.ed.gov/fulltext/ED492775.pdf adresinden edinilmiştir.

Ghasemi, F., Rastegar, A., Jahromi, R.G., & Marvdashti, R. R. (2011). The relationship between creativity and achievement motivation with high school students' entrepreneurship. *Procedia-Social and Behavioural Sciences*, (30), 1291-1296. Doi: 10.1016/j.sbspro.2011.10.250

Gibb, A. (1998).*Entrepreneurial Core Capacities, Competitiveness and Management Development in the 21st Century*. Durham: DUBS.

Gupta, V., MacMillan, I. C., & Surie, G. (2004). Entrepreneurial Leadership: Developing and Measuring A Cross-Cultural Construct. *Journal of Business Venturing*, *19*(2), 241-260. Doi: 10.1016/S0883-9026(03)00040-5

Gürbüz, S., & Şahin, F. (2018). *Sosyal Bilimlerde Araştırma Yöntemleri Felsefe, Yöntem, Analiz [Research Methods in Social Sciences: Philosophy, Method, Analysis]*. Ankara: Seçkin Yayıncılık.

Hinkin, T. R. (1995). A review of scale development practices in the study of organizations. *Journal of Management, 21*(5), 967-988. Doi: 10.1177/014920639502100509

Hitt, M., Ireland, R.D., Camp, S.M., & Sexton, D. (2002). *Strategic Entrepreneurship: Creating a New Mindset*. Cornwall: Blackwell Publishers.

Hu, L. T., & Bentler, P. M. (1999). Cutoff Criteria for Fit İndexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structural Equation Modeling*: *A Multidisciplinary Journal*, *6*(1), 1-55. Doi: 10.1080/10705519909540118

Hutchenson, G. D., & Sofroniou, N. (1999). *The Multivariate Social Scientist: An Introduction to Generalized Linear Models*. London: Sage Publications.

İşcan, Ö. F., & Kaygın, E. (2011). Üniversite Öğrencilerinin Girişimcilik Eğilimlerini Belirlemeye Yönelik Bir Araştırma [An Investigation to Determine the Entrepreneurship Tendency of University Students]. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 15(2), 443-462.

Kan, A. (2009). Ölçme Araçlarında Bulunması Gereken Nitelikler [Qualities Required in Measurement Tools]. H. Atılgan (Edt.), *Eğitimde Ölçme ve Değerlendirme* [Measurement and Evaluation in Education] (s. 23-80). Ankara: Anı Yayıncılık.

Karasar, N. (2012). *Bilimsel Araştırma Yöntemi [Scientific Research Method]*. Ankara: Bilim Kitap Kırtasiye Yayınevi.

Kets de Vries, M. F. R (1993). *Leaders, Fools and Imposters. Essays on the Psychology of Leadership.* Schiedam: Scriptum.

Kirkley, W. W. (2017). Cultivating entrepreneurial behaviour: entrepreneurship education in secondary schools. *Asia Pacific Journal of Innovation and Entrepreneurship*, *11*(1), 17-37. Doi: 10.1108/APJIE-04-2017-018

Kuratko, D. F. (2017). *Entrepreneurship: Theory, process, practice*. Boston: Cengage Learning.

Kuratko, D., & Hodgetts, R. (1998). *Entrepreneurship: A contemporary approach*. Sydney: Harcourt and Brace.

Lackeus, M. (2015). *Entrepreneurshıp In Educatıon: What, Why, When, How*. Organisation for Economic Co-operation and Development [OECD]. https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf adresinden edinilmiştir.

Lawshe, C. H. (1975). A Quantitative Approach to Content Validity. *Personnel Psychology*, (28), 563–575.

Livingston, S. A. (2018). *Test reliability—Basic concepts* (Research Memorandum No. RM-18-01). Princeton, NJ: Educational Testing Service.

Man, T. W., Lau, T., & Chan, K. (2002). The competitiveness of small and medium enterprises: A conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing*, *17*(2), 123–142.

Mazzarol, T., & Reboud, S. (2017). *Entrepreneurship and Innovation: Theory, Practice and Context*. Singapore: Springer Nature.

McClelland, D. A. (1961). *The Achieving Society*. Princeton, NJ: Van Nostrand.

McCowan, R. J., & McCowan, S. C. (1999). *Item Analysis for Criterion Referenced Tests.* New York: Research Foundation of SUNY/Center for Development of Human Services.

Minello, I. F., Scherer, L. A. & Alves, L. C. (2014). Entrepreneurial Competencies and Business Failure. *International Journal of Entrepreneurship*, (18), 1-15.

Mintzberg, H. (1990). Strategy Formation: Schools of Thought. InJ. Frederickson (Edt.).,*Perspectives on Strategic Management* (pp.105-237).New York: Harper Business.

Mitchelmore, S., & Rowley, J. (2010). Entrepreneurial competencies: A literature review and development agenda. *International Journal of Entrepreneurial Behaviour & Research*, *16*(2), 92–111. Doi: 10.1108/13552551011026995

Najim, A. N., El-Refae, G. A. & Alnaji, L. (2013). The Impact of the Key Dimensions of Entrepreneurship on Opportunities for the Success of New Ventures in the Greater Amman Municipality. *European Journal of Business and Management*, *5*(4), 159-173.

Nieman, G., Hough, J., & Nieuwenhuizen, C. (2004). *Entrepreneurship: A South African perspective.* Pretoria: Van Schaik Publishers.

Ntoumanis, N. (2001). *Step by Step Guide to SPSS for Sport and Exercise Studies*, New York, Routledge-Taylor &Francis Group.

Onstenk, J. (2003). Entrepreneurship and Vocational Education. *European Educational Research Journal*, 2(1), 74-89. Doi: 10.2304/eerj.2003.2.1.12

Özdamar, K. (2004). *Paket Programlar İle İstatistiksel Veri Analizi (Çok Değişkenli Analizler)[ Statistical Data Analysis with Package Programs]*. Eskişehir: Kaan Kitapevi.

Pahuja, A., & Sanjeev, R. (2015). Introduction to Entrepreneurship. https://www.researchgate.net/publication/301659818_Introduction_to_Entrepreneurship adresinden erişilmiştir.

Pihie, Z. A. L., Asimiran, S., & Bagheri, A. (2014). Entrepreneurial leadership practices and school innovativeness. *South African Journal of Education*, *34*(1), 1-11. Doi: 10.15700/201412120955

Plichta, S. B., & Kelvin, E. (2013). *Munro's Statistical Methods For Health Care Research*. Wolters Kluwer Health-Lippincott Williams & Wilkins. http://jumed15.weebly.com/uploads/5/8/7/5/58753271/munro%C3%A2s-statistical-methods-for-healt-care-research.pdf adresinden edinilmiştir.

Research Centre for Learning and Teaching of Newcastle University (2015). *Entrepreneurial School Leadership*. Newcastle University, UK (1.3.2015 tarihli rapor). http://www.ec4slt.com/documents/Drobnic_literature_review_2015.pdf adresinden erişilmiştir.

Rigdon, E. E. (1996). CFI versus RMSEA: A comparison of two fit indexes for structural equation modeling. Structural Equation Modeling: *A Multidisciplinary Journal*, *3*(4), 369-379. Doi: 10.1080/10705519609540052

Ruskovaara, E., Pihkala, T., Rytköla, T., & Seikkula-Leino, J. (2011). Entrepreneurship in entrepreneurship education–practices in finnish basic and secondary education level. ICSB World Conference Proceedings. https://developmentcentre.lut.fi/files/muut/ICSB_2011_Tukholma.pdf adresinden edinilmiştir.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. *Methods of Psychological Research Online*, *8*(2), 23-74.

Schriesheim, C. A., Powers, K. J., Scandura, T. A., Gardiner, C. C., & Lankau, M. J. (1993). Improving construct measurement in management research: Comments and a quantitative approach for assessing the theoretical content adequacy of paper-and-pencil survey-type instruments. *Journal of Management*, *19* (2), 385-417. Doi: 10.1016/0149-2063(93)90058-U

Schumpeter, J. A. (2011) . *Can Capitalism survive?* Connecticut: Martino Fine Books.

Slater, R. O., & Doig, J. W. (1988). Leadership In Education: Issues of Entrepreneurship and Environment. *Education and Urban Society*, *20*(3), 294-301.

Stevenson, H. H., & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, (11), 17–27.

Syapriyuda, S., & Santosa, A. B. (2020). Entrepreneurshıp Competence Of The Prıncıpal In Improvıng School Independence In Sd Muhammadıyah Kleco 2 Kotagede Yogyakarta. *International Journal on Education, Management and Innovation (IJEMI)*, *1*(1), 1-12. Doi: 10.12928/ijemi.v1i1.1484

Şeker, H., & Gençdoğan, B. (2014). *Psikolojide ve Eğitimde Ölçme Aracı Geliştirme [Measurement Tool Development in Psychology and Education]*. Ankara: Nobel Akademik Yayıncılık.

Tabachnick, B. G., & Fidell, L. S. (2015). *Çok Değişkenli İstatistiklerin Kullanımı [Use of Multivariate Statistics]*. (Çev. M. Baloğlu). Ankara: Nobel Yayınevi.

Tavşancıl, E. (2010). *Tutumların Ölçülmesi ve SPSS ile Veri Analizi[Measuring Attitudes and Data Analysis with SPSS]*. Ankara: Nobel Yayın Dağıtım.

Thornberry, N. (2006). *Lead Like an Entrepreneur*. Blacklick, OH: McGraw-Hill.

Tolentino, A. (1998) *Training and Development of Entrepreneurs-managers of Small Enterprises: pointers and lessons learned*. Geneva: International Labour Organization.

Wibowo, A., & Saptono, A. (2018). Does Entrepreneurial Leadership Impact on Creativity and Innovation of Elementary Teachers? *Journal of Entrepreneurship Education*, *21*(2), 1-9.

Wiersma, W., & Jurs, S. G. (1990). *Educational measurement and testing*. Boston, MA: Allyn and Bacon.

Yaşlıoğlu, M. M. (2017). Sosyal Bilimlerde Faktör Analizi ve Geçerlilik: Keşfedici ve Doğrulayıcı Faktör Analizlerinin Kullanılması [Factor Analysis and Validity in Social Sciences: Using Exploratory and Confirmatory Factor Analysis]. *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, *46*(Özel Sayı), 74-85.

Yemini, Addi-Raccah & Katarivas (2014). I Have a Dream: School Principals as Entrepreneurs. *Educational Management Administration & Leadership*, *43*(4), 1-15. Doi: 10.1177/1741143214523018

Yurdugül, H. (2005). *Ölçek Geliştirme Çalışmalarında Kapsam Geçerliliği için Kapsam Geçerlik &İndekslerinin Kullanılması [Using Content Validity &Indices for Content Validity in Scale Development Studies]*. XIV. Ulusal Eğitim Bilimleri Kongresi Pamukkale Üniversitesi Eğitim Fakültesi, 28–30 Eylül 2005, Denizli.

Zimmerer, T. W.,& Scarborough, N. M. (1996). *Entrepreneurship and New Venture Formation*. Upper Saddle River, NJ: Prentice Hall.

Zimmerer, T. W.,& Scarborough, N. M. (2001). *Essentials of Entrepreneurship and Small Business Management.* New Jersey: Prentice Hall.

## Appendix-1

| **ENTREPRENEURSHIP COMPETENCIES SCALE**<br>**Please mark the relevant option considering the level of your school principal in the situations below.** | | | | | | |
|---|---|---|---|---|---|---|
| | **My School Principal;** | | | | | |
| **Item No** | **Items** | **Strongly Disagree** | **Disagree** | **Partially Agree** | **Agree** | **Strongly Agree** |
| **1** | He/she has a curiosity about creating new values. | ① | ② | ③ | ④ | ⑤ |
| **2** | He/she is committed to his/her goals. | ① | ② | ③ | ④ | ⑤ |
| **3** | He/she is aware of his/her competencies. | ① | ② | ③ | ④ | ⑤ |
| **4** | He/she realizes his/her ideas. | ① | ② | ③ | ④ | ⑤ |
| **5** | He/she is willing to learn. | ① | ② | ③ | ④ | ⑤ |
| **6** | He/she continues a job he/she undertakes. | ① | ② | ③ | ④ | ⑤ |
| **7** | The desire for high success is reflected in his/her behavior. | ① | ② | ③ | ④ | ⑤ |
| **8** | He/she develops alternative projects. | ① | ② | ③ | ④ | ⑤ |
| **9** | When he/she detects opportunities, he/she uses them without hesitation. | ① | ② | ③ | ④ | ⑤ |
| **10** | He/she manages his/her time effectively. | ① | ② | ③ | ④ | ⑤ |
| **11** | He/she updates himself/herself. | ① | ② | ③ | ④ | ⑤ |
| **12** | He/she allocates resources while starting a new job. | ① | ② | ③ | ④ | ⑤ |
| **13** | He/she has high energy. | ① | ② | ③ | ④ | ⑤ |
| **14** | He/she takes into account the possibilities before starting a business. | ① | ② | ③ | ④ | ⑤ |
| **15** | He/she can revise old applications and present them in a new format. | ① | ② | ③ | ④ | ⑤ |
| **16** | He/she follows up opportunities regarding the development of the institution. | ① | ② | ③ | ④ | ⑤ |
| **17** | He/she activates the institution towards a new target. | ① | ② | ③ | ④ | ⑤ |
| **18** | He/she supports the discovery processes of the employees. | ① | ② | ③ | ④ | ⑤ |
| **19** | He/she is the person who initiates change in the organization. | ① | ② | ③ | ④ | ⑤ |
| **20** | He/she likes to research. | ① | ② | ③ | ④ | ⑤ |
| **21** | He/she does not miss opportunities that arise for the improvement of institutional practices. | ① | ② | ③ | ④ | ⑤ |
| **22** | He/she can bring together different resources belonging to the institution and reveal them in a useful way. | ① | ② | ③ | ④ | ⑤ |
| **23** | He/she has a dynamic vision. | ① | ② | ③ | ④ | ⑤ |
| **24** | He/she likes to present innovation. | ① | ② | ③ | ④ | ⑤ |
| **25** | He/she creates new values out of existing resources. | ① | ② | ③ | ④ | ⑤ |
| **26** | He/she supports the diversity of ideas. | ① | ② | ③ | ④ | ⑤ |
| **27** | He/she creates an environment in the institution where people can present their ideas without hesitation. | ① | ② | ③ | ④ | ⑤ |
| **28** | He/she is open to new ideas. | ① | ② | ③ | ④ | ⑤ |
| **29** | He/she supports good practices produced by employees. | ① | ② | ③ | ④ | ⑤ |
| **30** | He/she cooperates with employees in achieving goals. | ① | ② | ③ | ④ | ⑤ |
| **31** | He/she cares about employee participation in achieving a job. | ① | ② | ③ | ④ | ⑤ |
| **32** | He/she uses communication processes well. | ① | ② | ③ | ④ | ⑤ |
| **33** | He/she analyzes the requirements of the environment well. | ① | ② | ③ | ④ | ⑤ |

| | | | | | | |
|---|---|---|---|---|---|---|
| **34** | He/she takes risks. | ① | ② | ③ | ④ | ⑤ |
| **35** | He/she is not afraid of failure. | ① | ② | ③ | ④ | ⑤ |
| **36** | He/she makes independent decisions. | ① | ② | ③ | ④ | ⑤ |
| **37** | He/she takes initiative. | ① | ② | ③ | ④ | ⑤ |
| **38** | He/she does not hesitate to start a new project even if the resources are not provided. | ① | ② | ③ | ④ | ⑤ |