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Evaluation of teacher candidates' life skills in terms of departments and grade levels

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Abstract: The purposes of this research were (i) testing the factor and model structure of the life-skills scale (LSS) on teacher candidates and (ii) inspecting the life skills of teacher candidates according to their departments and grade levels. The participants consisted of 518 teacher candidates, all of whom were students in their sophomore or senior years in the education faculty of a state university. The data were collected through the LSS, which has 83 items. The confirmatory factor analysis of LSS verified the ten-factor structure for the teacher candidates (aged between 18 and 25). There were no statistically significant differences in the mean value of teacher candidates' life skills according to the grade variable. On the contrary, there were statistically significant differences in the dependent variables according to the department. Future directions of research regarding the educational outcomes of life skills were discussed.

1. INTRODUCTION

The term 'life skills' was first used during the psychological consultation intervention phase of the 'project try' program, which was an initiative against poverty (Adkin, 1984). During this program, which is also referred to as "the first life skills program", the term "life skills" was used as the description of the behavioral psychological learning ability required for dealing with the predictable developmental tasks. Adkins (1984) stated that this term was spread to the general culture and gained various meanings. Following the 1960s, there was an increasing interest in life skills programs (Bailey & Deen, 2002). The objectives and the target groups of these programs varied and included, but were not limited to, reduction, adolescence problems, marriage/separation/divorce problems, protection from contagious diseases, occupational problems, occupational and industrial career development, health, death, teacher & consultant training, suicidality in young people, eating habits, and sports (Adkins, 1984; Bailey & Deen,

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2002; United Nations International Children's Emergency Fund [UNICEF], 2012, p. 10, World Health Organization [WHO], 1997, p. 13).

WHO (2004, p. 4) defined life skills as the positive behaviors that help individuals cope with daily life's difficulties and challenges efficiently. These skills were explicitly described as the psychological skills which assist people in conscious decision making, problem-solving, critical thinking, creative thinking, and efficient communication. In the related literature, there are various classifications regarding life skills. Tan (2018) summarized the definitions and the contexts of five classifications regarding life skills (Table 1) and found out that although Brooks, UNICEF (2012), WHO (1997), The Collaborative for Academic, Social, and Emotional Learning [CASEL], and Fitzpatrick et al. (2014) suggested different classifications for life skills, their definitions were similar within the frameworks of cognitive skills, personal skills, and interpersonal skills.

Table 1. *Summary of various categories of life skills frameworks (Tan, 2018, p. 21*).

Brooks (Ginter, 1999)	WHO (1997)	CASEL	UNICEF (2012)	Fitzpatrick et al. (2014)
Interpersonal communication/ Human relations Problem-solving/ Decision making Physical fitness/ Health maintenance Identity development/ Purpose in life	Communication/Interpersonal relationships Problem-solving/Decision making Creative thinking/Critical Thinking Self-awareness/ Empathy Coping with emotions/ Coping with stressors	Self-awareness Self-management Social awareness Relationship skills Responsible decision making	Cognitive Personal Interpersonal	Thinking Learning Practical

Today, life skills education is an integral part of the education system in many countries in the world. International organizations like UNICEF and WHO report that life skills education is crucial for young people. Since the wealth and the competitive power of the countries are directly related to the qualified workforce (Trilling & Fadel, 2009, p. 7), there is an increasing demand for individuals who possess today's life skills (Erduran Avcı & Kamer, 2018). Therefore, many countries put the life skills in the curriculum (The Turkish Ministry of National Education [TMNE], 2018; Indian National Council of Educational Research and Training, 2005; Ministry of Education, Singapore, 2016); modify the curriculum according to the knowledge, skills, and competencies related to the life skills (European Commission / EACEA / Eurydice, 2012); and develop and apply programs that aim to make students gain life skills aligned with their national requirements (Allen & Lohman, 2016; Chauhan, 2016; O'Rourke et al., 2016; UNICEF, 2012).

Skill mismatch can be defined as "the mismatch between the skills of an individual and the skills required for the job they have" (Güneş, 2016; p. 210) and is a common issue in upper education which also affects the graduates (The European Centre for the Development of Vocational Training [CEDEFOP], 2010). The individuals have to learn the required skills to keep pace with life and the era's rapid changes (Khatoon, 2018). Therefore, the education systems, together with the teachers as their practitioners, have a vital role in skill learning. Tenth Development Plan of the Turkish Ministry of Development emphasizes the life skills among the educational objectives as follows:

"*The main objective of the education system is raising productive and happy individuals who possess advanced thinking, perception, and problem-solving capabilities, internalize democratic values and national culture, are open to sharing and communication, has strong artistic and aesthetic emotions, has the entrepreneurial spirit and innovative approach with self-confidence and responsibility, are familiar with using and generating science and technology, and equipped with the basic information and skills required in the information society*." (Tenth Development Plan for the Republic of Turkey, 2013; p. 32).

The general and specific objectives of the Turkish national education and instruction programs (TMNE, 2018, p. 4) include growing individuals who possess integrated knowledge, skills, and behavior in the selected qualifications, which are defined in the qualifications framework (The Turkish Qualifications Framework [TQF], 2015). A closer look reveals that many life skills are emphasized among the skills mentioned in the programs. Therefore, all teachers, regardless of their branch, are expected to contribute to the development of students' life skills.

Teachers play a vital role in promoting life skills that prepare students for adulthood (Amutha & Ramganesh, 2013; Cassidy et al., 2018; Erduran Avcı & Kamer, 2018; Kaufman, 2013; Kurtdede-Fidan & Aydoğdu, 2018). According to the research, which predicts the causal effect of the interventions during secondary and higher education on life skills development, the 'teacher quality' is one of the important effects among all (Schurer, 2017). Due to the differentiating requirements of individuals and new educational approaches, teachers of today have new occupational responsibilities. These new responsibilities require new teacher qualifications in various fields. One of such qualification fields is the skills field, which includes life skills like creative thinking, analytical thinking, and developing self-awareness besides the occupational skills (TMNE, 2017). It is common to perceive that the teacher candidates, who have higher qualifications regarding these skills, would be more successful in gaining life-long learning habits and developing them (Kozikoğlu & Altunova, 2018). Evin Gencel (2013) stated that determining the level of such skills for teachers and teacher candidates contributed to planning the further stages and taking the required measures. According to the studies in the literature, students of art departments had higher skills compared to the students of other departments (Doğramacıoğlu, 2016; Kayahan & Çakmakoğlu-Kuru, 2017; Milli & Yağcı, 2017; Otacıoğlu, 2007; Sardoğan & Ağaoğlu, 2005).

We see that some domain-specific skills are emphasized in the specific objectives of the curriculum in compulsory education in Turkey. These skills vary according to the department courses (TMNE, 2018a, 2018b, 2018c). For instance, scientific process skills, some life skills (analytical thinking, decision-making, communication, creative thinking, entrepreneurship, and teamwork), and engineering-design skills are domain-specific skills for science course instruction program (TMNE, 2018a), where balanced diet, use of resources, personal care, self-management, and time management are domain-specific skills for the life sciences course instruction program (TMNE, 2018b). These domain-specific skills are similar to the sub-skills in some of the life-skills classifications in the literature (Fox et al., 2003; Hendricks, 1998; WHO, 2004, p. 9). Besides, Cronin and Allen (2017) view these skills as behavioral, cognitive, interpersonal, or intrapersonal competencies that can be learned, developed, and refined. Due to these aspects, it is important to evaluate teacher candidates' life skills based on their departments and grade levels.

Life skills scales are instruments that are used to measure individuals' life skills. The life skills scales in the literature are generally applied to students in adolescence (Bailey & Deen, 2002; Erawen, 2010; Erduran Avcı & Korur, 2019, June; Greene, 2008; Kadish et al., 2001; Prasad, 2018; Vranda, 2009). There are also studies on young athletes/campers (Cronin & Allen 2017; Garst et al., 2016), teacher trainees (Chauhan, 2016), teacher candidates (Bhardwaj, 2013; Bolat & Balaman, 2017). Life skills is a broad concept that includes a lot of sub-skills (WHO, 1997).

WHO (1997) categorized the core life skills into ten categories from a broad perspective. Therefore, we examined the scales that (i) included the life skills stated by WHO and (ii) were in Turkish literature for cultural similarity. Erduran Avcı and Korur's (2019, June) life skills scale (11-18 years) included ten sub-factors and each factor had many items with high representation power. The researchers provided strong evidence about the theoretical structural compatibility, validity, and reliability of this scale. In this study, we were allowed to test the structural compatibility of Erduran Avcı and Korur's (2019, June) LSS on teacher candidates, who were between 17 and 25, and use it.

The purpose of this study was to examine the difference among teacher candidates' life skills according to their departments and grade levels. The term "teacher candidates" was used throughout the study with the meaning of "students trained from higher education institutions to become professional teachers" (IGI Global, n.d.). By evaluating the life skills of teacher candidates, this research may contribute to (i) developing solutions and strategies for 'skill mismatch' problem in teacher training, (ii) developing teacher training policies according to the skill needs, and (iii) planning the life skills training of the generations that will have the life skills we need. To accomplish this purpose, the research questions were as follows: (1) Is the LSS instrument valid and reliable for the students at the university level based on the results of the confirmatory factor analyses? (2) Are there any statistically significant differences between the students' average scores of life skills dimensions according to six different departments and two different grade levels?

2. METHOD

The descriptive survey model was used to examine the teacher candidates' life skills in terms of different variables. This model explains the information about a topic according to different independent variables. The participants' opinions or features such as interests, skills, or behavior are identified with this model. The main purpose of survey research is to describe the current situation of the research topic (Fraenkel et al., 2011, p. 393).

2.1. Participants

With the convenience sampling method, 640 teacher candidates in a state university's education faculty volunteered for and participated in this study. Fraenkel et al. (2011) stated that researchers in social sciences tend to use the convenience sampling method more frequently because it is not possible for researchers to use the time, money, or other resources required for random sample selection. The distribution of the remaining 518 participants by department and grade level are presented in Table 2.

Table 2. *Distribution of teacher candidates by department and grade level.*

Department		Grade level		Total
		1st grade	4th grade	
Math-science Education	Science	17	53	70
	Mathematics	29	44	73
Primary education	Primary school	33	32	65
	Pre-school	36	18	54
Turkish-social science education	Turkish Language	32	17	49
	Social science	15	13	28
Fine arts	Music	9	15	24
	Art	8	9	17
Educational science	Guidance and Psychological Counselling [GPC]	44	25	69
Foreign language	English Language	26	43	69
Total		249	269	518

Among these participants, the data of 122 participants whose data were found to be inconsistent (such as giving the same answers to most of the questions one after the other) and/or they left the question items in the scale blank were not included in the further analysis.

2.2. Variables

The variables that were used in the statistical analysis of this research are presented in Table 3. The details of two independent variables (grade level and department) and ten dependent variables, namely the scores for the dimensions, are provided in the table.

Table 3. *Description of the variables.*

Variable Name	Variable (wrt types)	Variable (wrt values)	Derived/Taken Items from the Scale	Variable Label / Source	Min.-Max.
Grade Level	Independent	Categorical	Demographic#1	1, 4	-
Department	Independent	Categorical	Demographic#2	1, 2, 3, 4, 5, 6	-
Critical thinking	Dependent	Continuous	1-6	Total mean scores within each category	1-5
Creative thinking	Dependent	Continuous	7-16		
Decision making and problem-solving	Dependent	Continuous	17-28		
Coping with stress and emotions	Dependent	Continuous	29-39		
Interpersonal relationship and communication	Dependent	Continuous	40-46		
Empathy	Dependent	Continuous	47-53		
Self-awareness	Dependent	Continuous	54-65		
Self-respect	Dependent	Continuous	66-73		
Teamwork	Dependent	Continuous	74-78		
Social responsibility	Dependent	Continuous	79-83		

2.3. The Instrument (LSS) and Data Collection Process

The LSS, which was developed by Erduran Avcı and Korur (2019, June) for evaluating the life skills of students at puberty, was used in this study. The scale was created by Erduran Avcı and Korur (2019, June) following the five-stage approach proposed by Hinkin (1998). The stages are as follows: item generation (creating the initial item pool), scale management (including expert views), initial item reduction (including exploratory factor analysis [EFA], confirmatory factor analysis [CFA], and convergent/discriminant validity (reporting the validity issues). The execution of the stages was performed on two different groups of students aged between 11 and 18. Six hundred seventy-nine students (EFA) were in the first study group and 585 students (EFA) were in the second study group. The factor analysis fit of the data, which was obtained by applying the scale to the first group, was evaluated using the Kaiser–Meyer Olkin (KMO) coefficient, and the sample size sufficiency was evaluated with Bartlett Sphericity Test. The fit of both values was confirmed (KMO value, .957; Bartlett Sphericity, χ^2= 27350.787, p<.001). According to the explanatory factor analysis results, which was performed by varimax rotation of principal component analysis, 83 items of the LSS with load factors greater than the threshold were grouped under 10 factors with eigenvalues greater than one. These factors represented the dimensions of the scale. The dimensions and the numbers of items were as follows: Critical thinking (1-6), creative thinking (7-16), decision making and problem-solving (17-28), coping with stress and emotions (29-39), interpersonal relations and communication (40-46), empathy

(47-53), self-awareness (54-65), self-respect (66-73), teamwork (74-78), and social responsibility (79-83). The items of LSS were five-point Likert type (1: *strongly disagree*, 5: *strongly agree*) and the average scores for dimensions were 1 and 5 for minimum and maximum, respectively. Higher scores resembled students' higher perception of life skills. The total variance of these dimensions explained 51.07% of the variance. The factor load values varied between .32 and .81. Cronbach's alpha internal consistency coefficient was .964 for the whole model, where it varied between .717 and .916 for the dimensions. The average scores varied between 3.15 (teamwork) and 4.14 (empathy). After the application of LSS to the second workgroup, DFA model fit indices were calculated as $\chi^2(3268)= 5953.19$ $p< .001$; $\chi^2/sd= 1,822$, RMSEA= .0038, SRMR= .049, CFI= .900, and IFI= .901. Cronbach's alpha internal consistency coefficient for the whole scale was .973 and .750 to .940 for the dimensions. The average scores of the second phase's dimensions varied between 3.40 (teamwork) and 4.20 (empathy). These findings were found to be coherent to the hypothetic structure of the LSS suggested by Erduran Avcı and Korur (2019, June); the composite reliability, convergent validity, and discriminant validity values were in the acceptable range; and this scale was a proper instrument which could be used in assessing life skills for the future studies. We have cooperated with two domain experts to qualify LSS as a proper instrument for the university students out of the specified age range in the original study. After evaluating the appearance and content of LSS, the experts suggested that LSS could be applied without any changes. LSS was originally in Turkish and sample items in the original language are presented in Figure 1.

Figure 1. *Sample items from the LSS (in Turkish).*

	1	2	3	4	5
1. Kanıtlar yanıldığımı gösterdiğinde, düşüncelerimi değiştiririm.					
2. Bir olayı çeşitli açılardan değerlendirebilirim.					
3. Bir olay sonucunda doğabilecek riskleri değerlendirebilirim.					
4. Fikirlerimi, gerçekler ve deneyimler ile oluştururum.					
5. Kendimi geliştirmek için yaptığım her hareketi eleştiririm.					
6. Nedenleri ve kanıtları temel alarak bir durumu anlamaya çalışırım.					
7. Başkalarından fikir ve öneri alırım, ancak onlara inanmadan önce kendim analiz ederim.					
8. Bir işi farklı tarzda/yenilikçi yapmaktan hoşlanırım.					
9. İşlerimi dikkatli yapmaya özen gösteririm.					

At the start of the data collection process, we obtained the required permissions to apply the LSS to the teacher candidates. We made the volunteer teacher candidates fill the LSS forms at their convenience. The first two authors conducted the data collection. It took approximately 20 minutes for a teacher candidate to fill out the LSS.

2.4. Data Analysis Procedure

To analyze the answer to the first research question, we ran the default model, which was constrained by the factor loadings, in AMOS and tested the model fit to the ten-factor structure of the original LSS. CFA process is a statistical technique and it starts with a hypothesis that suggests that there is a relation between the observed variables and the hidden variables beneath them (Child, 1990). According to Mahalanobis distance p <.001 (Tabachnick & Fidell, 2007, p. 99), the outliers were confirmed and 23 students' data were excluded and CFA was processed with data of 495 students. It was stated that the minimum sample size to perform the CFA can be taken as $N\geq100$ to 200 or can be calculated as at least 5 to 10 participants per parameter released (Bentler & Chou, 1987; Brown, 2006). Determining the sample size with general acceptances may reveal poor generalizability. For obtaining sufficient statistical power and suitable precision of parameter estimates in CFA, the sample size might be deducted from the

complexity of the model, amount of missing data, and other variables (such as number of observed variables, number of latent variables, and probability level; Brown, 2006). These features will vary widely depending on the data sets in the studies (Brown, 2006). In this context, by entering anticipated effect size as .5 (medium effect size is generally accepted in science education research), desired statistical power level as .95, number of latent variables as 45, number of observed variables as 83, and probability level as .05 values, the recommended minimum sample size was found to be 441 for CFA through an online calculator (DanielSoper, n.d.). Even though the number of participants in the sample group was appropriate according to our model, it should be considered carefully in terms of the study's generalizability. Data were examined for normal homoscedasticity. The common fit indices are given in Table 4 with their critical value ranges.

In addition to the values in Table 4, Hu and Bentler (1999) determined phased criteria, which will keep Type I and Type II errors at a minimum while maintaining an acceptable fit between the data and the model, as a) SRMR value close to or lower than .08, b) RMSEA value close to or lower than .06, and c) CFI value close to or greater than .95. In this study, to determine the model fits from the standardized scores, we used Hu and Bentler's (1999) above-mentioned model fit criteria.

Table 4. *Fit indices and critical value ranges.*

Fit indices	Good fit	Acceptable fit
$\chi 2$/sd	$0 \leq \chi 2/df \leq 2$	$2 < \chi 2/df \leq 3$
RMSEA	$0 \leq$ RMSEA $\leq .05$	$.05 <$ RMSEA $\leq .08$
SRMR	$0 \leq$ SRMR $\leq .05$	$.05 <$ SRMR $\leq .10$
IFI	$.95 \leq$ NFI ≤ 1.00	$.90 \leq$ NFI $< .95$
CFI	$.95 \leq$ CFI ≤ 1.00	$.90 \leq$ CFI $< .95$

Note: Adopted from Schermelleh-Engel et al. (2003). χ^2 = chi-square, *df*=degree of freedom, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardised Root Mean Residual, IFI = Incremental Fit Index and CFI = Comparative Fit Index.

To find the answer to the second research question, we examined the interaction of six different departments and two different grades by using MANOVA. The analysis proved that there was a statistically significant interaction (grade*department) effect on the average scores of the students [Pillai's Trace = .183, F (50, 2505) = 1.905, $p < .05$, partial $\eta 2 = .037$]. In other words, the data suggested that the effect of studying in different departments on LSS dimension scores was not the same for 1st-grade and 4th-grade students. Since this analysis was performed on interaction with 2*6=12 different variables, we thought that it might be caused by the number of participants in each group (specifically the number of students in different departments). To eliminate this possibility, we assigned a new independent variable for each group and performed MANOVA again. We found that there were no statistically significant differences in further analysis. Therefore, we examined single main effects instead of department*grade interaction. In this study, we analyzed the statistically significant differences between the students' average scores for 10 dimensions according to two different grade levels and six different departments by conducting separate MANOVAs. We confirmed that the observations were independent, and the sample size was sufficiently large for MANOVA groups. We also conducted preliminary analyses to test the assumptions of MANOVA.

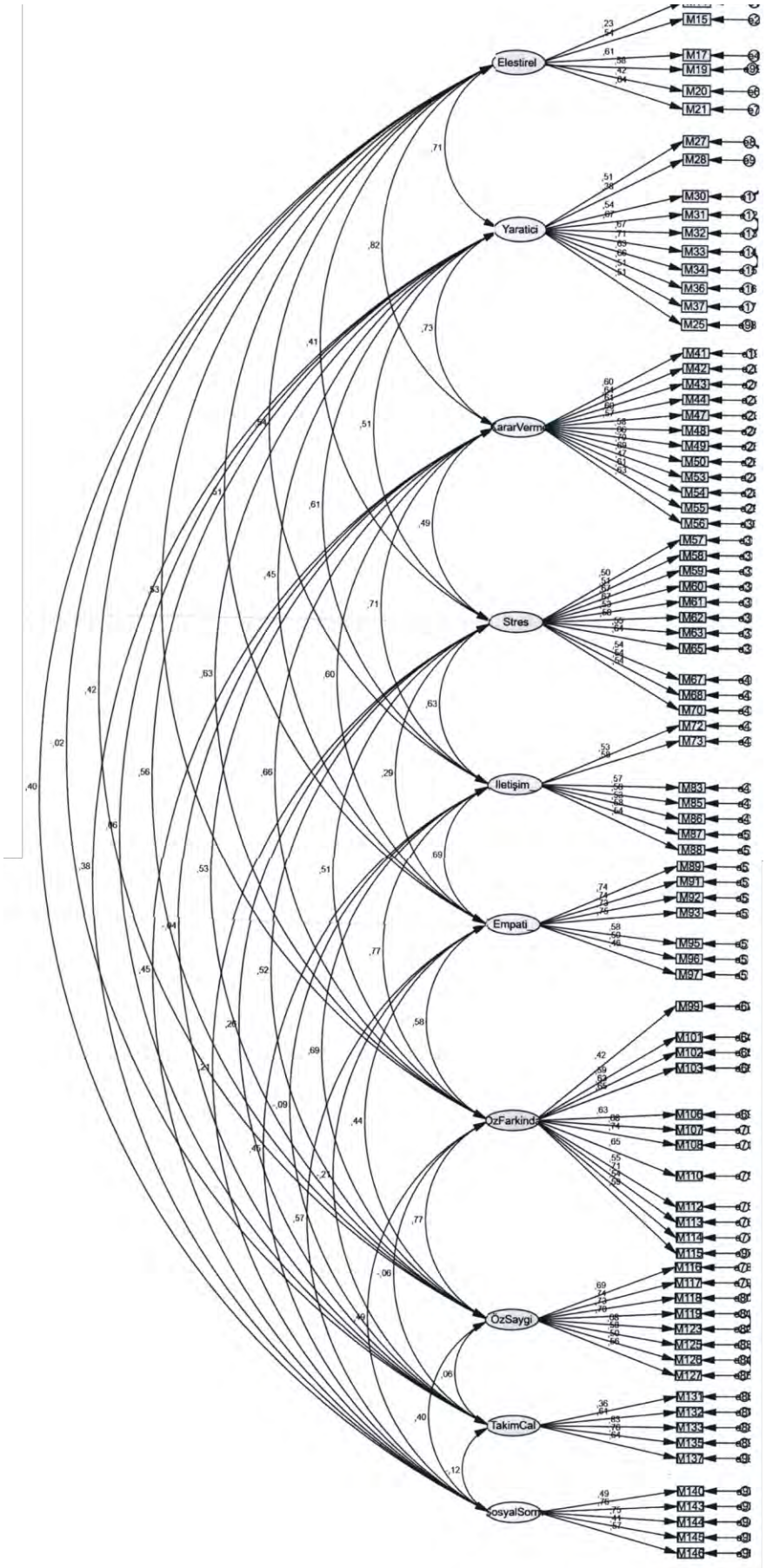
The outliers in the data were analyzed in terms of Mahalanobis distances (p<.001), for the assumption of absence of multiple variable outliers and MANOVA was carried out with 518 students' data (Tabachnick & Fidell, 2007, p. 99). For the assumption of the normal distribution of the dependent variables for each independent variable, skewness and kurtosis values for 10

dimensions were inspected for -1.5 to +1.5 points range. At the end of this process, we assumed that the data fit normal distribution [Byrne, 2010; extremum points for the skewness between -.072 (stress) and -1.005 (social responsibility); extremum points for the kurtosis -.118 (teamwork) and .765 (social responsibility)]. To meet the absence of multicollinearity assumptions, we inspected the scatter-plot matrix graphs to confirm the linear relations among the dependent variables. Besides, we observed that there was a low to moderate correlation among the dependent variables (<.80); and there was no multicollinearity (Tabachnick & Fidell, 2007). For the assumption of homogeneity of variable matrices, significant differentiation was found among the groups according to Box's M test performed based on grade levels and departments (according to grade levels: Box's M = 98.426, F(55, 849453.550) = 1.753, $p < .05$; according to departments: Box's M = 377.470, F(275, 164505.213) = 1.293, $p > .001$). If group sizes are above 30, the MANOVA is robust against violations of homogeneity of variance matrices assumption (Allen & Bennett, 2008; Hair et al., 2006; Tabachnick & Fidell, 2007). Furthermore, Tabachnick and Fidell (2007) recommended to test the Box's M at the p=.001 level for unequal sample sizes; if M is not significant at the .001 level, it may be concluded that significance tests in MANOVA may be robust. The MANOVA results were evaluated with Pillai's Trace test data, which is widely accepted as a stronger test than Wilk's Lambda value (Field, 2009). According to grade levels, the findings of Levene's test showed that the assumption of homogeneity of variances was satisfied for all of the LSS dimensions ($p > .05$). The findings of Levene's test according to departments showed that the assumption of homogeneity of variances was satisfied except for five dimensions: critical thinking score [F(5,512)=3.775; p=.002]; creative thinking score [F(5,512)=.481; p=.790]; decision making & problem-solving score [F(5,512)=.903; p=.479]; coping with stress and emotions score [F(5,512)=2.699; p=.020]; interpersonal relations and communication score [F(5,512)=1.041; p=.393]; empathy score [F(5,512)=4.801; p=.000]; self-awareness score [F(5,512)=2.191; p=.054]; self-respect score [F(5,512)=1.897; p=.093]; teamwork score [F(5,512)=4.731; p=.000], social responsibility score [F(5,512)=3.650; p=.003]. Further analyses provided for MANOVA (such as Tukey's HSD) are sensitive to unequal variances but multiple comparison procedures by SPSS (e.g. Tambane's T2, Dunnett's T3, or Dunnett's C) are provided for such cases, where unequal group sizes or high variances ratios (Field, 2009; p. 374). In this study, we examined the dimensions, which did not satisfy the assumption of homogeneity of variances, with Tamhane's T2 index instead of Tukey's HSD. According to these results, the related assumptions of the MANOVA were met.

3. RESULT / FINDINGS

In this phase, we conducted a CFA to confirm that the structure, which was obtained by applying LSS to the teacher candidates, was compliant to the structure, which was obtained by the application of LSS to the students aged between 11 and 18. In the beginning, we run CFA for the 10-factor structure of LSS to discover the findings for the first research question. Figure 2 presents the 10-factor structure with 83 items and their corresponding loads. The inspection of model fit indices and detailed model parameter analyses revealed that the fit indices of the 10-factor structure were close to the corresponding acceptable threshold values in Table 3 [$\chi 2$ (3249, 495) = 5224.521, p <.001; $\chi 2/df$= 1.608, RMSEA= .035, SRMR= .0527; CFI= .877, IFI= .878, RMR= .046, and AGFI= .785)]. Also, the scale's fit threshold values, which are the combinations of SRMR, RMSEA, IFI, and CFI values, satisfied the phase criteria of Hu & Bentler (1999). The findings of the application of LSS to the teacher candidates were in an acceptable harmony with the Erduran Avcı and Korur (2019, June)'s a hypothetical structure with 10 dimensions.

Figure 2. *The path diagram of the ten-factor structure of the LSS.*



The separate MANOVAs, which were conducted to answer the second research question, indicated that there were no statistically significant differences between the students' average life skills score in 10 dimensions according to two different grade levels [Pillai's Trace = .028, F (10, 507) = 1.445, p = .157, partial η^2 = .028]. There were low to medium significant differences in the student scores in the dimensions of LSS with regards to the students' departments [Pillai's Trace = .242, F (50, 2535) = 2.573, p < .05, partial η^2 = .048]. Further analyses were conducted to find out the dimensions with such interaction. It was found that there were statistically significant low to medium mean differences for the dimensions: critical thinking, low [F(5, 512)=6.135, p=.000, partial η^2=.057]; creative thinking, medium [F(5, 512)=6.902, p=.000, partial η^2=.063]; decision making & problem-solving, medium [F(5, 512)=7.239, p=.000, partial η^2=.066]; coping with stress and emotions, low [F(5, 512)=3.581, p=.000, partial η^2=.034]; interpersonal relationship and communication, low [F(5, 512)=3.122, p=.009, partial η^2=.030]; empathy, low [F(5, 512)=5.394, p=.000, partial η^2=.050]; self-awareness, medium [F(5, 512)=7.340, p=.000, partial η^2=.067]; self-esteem, low [F(5, 512)=5.055, p=.000, partial η^2=.047]; teamwork, low [F(5, 512)=5.007, p=.000, partial η^2=.047]; social responsibility, low [F(5, 512)=3.981, p=.001, partial η^2=.037] (Cohen, 1988). Table 5 presents the results of post hoc analyses regarding this significant difference according to the departments.

After inspecting the significant differences among the departments in Table 5, it can be stated that the average scores of the students in the Fine Arts department in critical thinking, creative thinking, decision making, stress, self-awareness, self-respect, teamwork, and social responsibility were higher. There is at least one dimension, in which the students in the Fine Arts department was significantly higher than the students of the other five departments. On the other hand, it was found that the average scores for critical thinking, creative thinking, decision making, communication, empathy, self-awareness, and social responsibility were higher in the Primary Education department students (except the fine arts department students). Just for self-awareness, the average scores of the students in the Foreign Languages department were significantly higher than the ones of GPC students (p = .004, $\overline{X}_{difference}$= 3.8406). There were no cases where the remaining department students' average dimension scores were significantly higher than the other departments. The average scores of GPC students were lower than the corresponding average score of at least one department, except stress and communication dimensions.

Table 5. *Post hoc Analysis for MANOVA.*

Dependent Variable				Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Critical thinking	Tamhane T2	Primary education	GPC	1.4274*	.42907	.017	.1493	2.7054
		Fine arts	Math-Science	2.3114*	.44878	.000	.9572	3.6657
			GPC	2.7239*	.50614	.000	1.2043	4.2435
			Foreign language	1.9703*	.49198	.002	.4915	3.4491
Creative thinking	Tukey HSD	Primary education	GPC	2.8011*	.82296	.009	.4470	5.1552
		Fine arts	Primary education	3.0119*	.98490	.028	.1945	5.8292
			Math-Science	4.3981*	.96349	.000	1.6420	7.1542
			Turkish-social science	4.1334*	1.05148	.001	1.1256	7.1412
			GPC	5.8130*	1.07245	.000	2.7452	8.8808
			Foreign language	3.2913*	1.07245	.027	.2235	6.3591
Decision making and problem-solving	Tukey HSD	Primary education	Math-Science	2.9140*	.77992	.003	.6830	5.1450
			GPC	3.3280*	.95109	.007	.6073	6.0486
		Fine arts	Math-Science	5.0607*	1.11350	.000	1.8755	8.2459
			GPC	5.4747*	1.23943	.000	1.9293	9.0202
			Foreign language	4.4168*	1.23943	.005	.8713	7.9622
Coping with stress and emotions	Tamhane T2	Fine arts	Math-Science	5.4612*	1.51073	.010	.8411	10.0813
Interpersonal relationship and communication	Tukey HSD	Primary education	Math-Science	1.5041*	.51117	.040	.0418	2.9663

Table 5. *Continues.*

Empathy	Tamhane T2	Primary education	Math-Science	1.7292*	.38576	.000	.5892	2.8691
			Turkish-social science	2.1022*	.56977	.005	.3984	3.8059
			GPC	1.8083*	.52587	.012	.2346	3.3820
Self-awareness	Tukey HSD	Primary education	GPC	3.7318*	.93283	.001	1.0634	6.4002
		Fine arts	Math-Science	4.5705*	1.09212	.000	1.4465	7.6946
			Turkish-social science	3.9721*	1.19186	.012	.5628	7.3815
			GPC	6.3510*	1.21563	.000	2.8736	9.8284
		Foreign language	GPC	3.8406*	1.04957	.004	.8382	6.8429
Self-esteem	Tukey HSD	Fine arts	Math-Science	3.5478*	.86535	.001	1.0725	6.0232
			Turkish-social science	3.0184*	.94437	.018	.3169	5.7198
			GPC	4.5345*	.96321	.000	1.7792	7.2898
			Foreign language	2.9548*	.96321	.027	.1995	5.7101
Teamwork	Tamhane T2	Fine arts	Primary education	3.7866*	1.01728	.007	.6772	6.8960
			Math-Science	3.7339*	.99683	.007	.6767	6.7912
			GPC	3.8657*	1.02796	.006	.7272	7.0042
Social responsibility	Tamhane T2	Primary education	Math-Science	1.0358*	.33415	.032	.0484	2.0232
			GPC	1.6172*	.47608	.014	.1913	3.0431
		Fine arts	Math-Science	1.3012*	.43006	.048	.0056	2.5968
			GPC	1.8826*	.54767	.012	.2427	3.5226

4. DISCUSSION and CONCLUSION

This study was conducted for two purposes: i) to test the 10-factor theoretical structure of LSS for teacher candidates aged between 18 and 25, ii) to find out whether the life scale dimension scores of the teacher candidates varied according to the departments and grade levels. The findings of the study are discussed below based on these two purposes.

LSS, which was developed by Erduran Avcı and Korur (2019, June) was applied to the teacher candidates in the research group of this study. The results of CFA indicated that the structure model of the scale, which included 10 dimensions and 83 items, was confirmed. We can say that LSS did not perform perfectly according to the fit indices and some correlation incompatibilities. However, the 10-factor structure was very close to the acceptable ranges according to the model fit indices and the values obtained by detailed parameter analyses for the model. Reasons for this fact might include (i) Erduran Avcı and Korur (2019, June) followed a well-planned and systematic process to develop the scale-LSS, which was used in this study, and (ii) the structural validity of the scale, together with the items in its dimensions, was high. Also, possible similar expectations and perceptions of the students of puberty, to whom the original scale was applied, and the teacher candidates, to whom the scale was applied in this study, might be another reason. It is common knowledge that puberty can continue until the twenties (Çardak, 2013, pp. 62-64). At ages 18 to 25, one usually attends university and this period covers late puberty and early adulthood. During this period, young individuals build new social relations and keep improving themselves for the rest of their life. According to the "life-span, life-space" theory (Super, 1990), the period between ages of 15 to 24 is the exploration phase. The individuals in the exploration phase explore their interests, skills, values, and more (Eryılmaz & Mutlu, 2017). Therefore, although the age groups of the samples in this study and Erduran Avcı and Korur (2019, June) were different, it can be stated that these two age groups have some intersections, common skills, and perceptions. A few studies also examine the life skills of teacher candidates in the literature (Bhardwaj, 2013; Bolat & Balaman, 2017; Chauhan, 2016).

The analyses of ten sub-factors of LSS showed that there were no statistically significant differences in the life skills of teacher candidates according to their grade levels but there were significant differences according to department variable. Teacher candidates' scores for all of the LSS sub-factors (critical thinking, creative thinking, decision-making & problem-solving, coping with stress and emotions, interpersonal relations & communication, empathy, self-awareness, self-respect, teamwork, and social responsibility) varied significantly according to their departments. There were significant differences in favor of fine arts, primary education, and foreign language departments compared to many other departments. Among those, the most significant differences were observed in the fine arts department. The scores of the students in the fine arts department were different compared to many other departments in eight dimensions (critical thinking, creative thinking, decision making & problem-solving, coping with stress and emotions, self-awareness, self-respect, teamwork, and social responsibility). Specifically, there was a significant difference in favor of the fine arts department in creative thinking sub-dimension when compared to the other departments. In Turkey, the fine arts departments accept students by a special talent exam, which is unique to each fine arts department, where all other departments accept students by a central exam named higher education institutions exam [HEIE]. Therefore, the researchers think that this result, which is in favor of the fine arts students, is natural because the students of the fine arts department were accepted to the university with a completely different assessment process. Similarly, Sardoğan and Ağaoğlu (2005) stated that the students in visual arts, music, and physical training departments had a higher level of emphatic skills than the students who were accepted to the university HEIE. Kayahan and Çakmakoğlu Kuru (2017) states that the departments like visual communication design, which accept students by a talent exam, were more successful than the other

departments when evaluated according to criteria like interest in the domain lessons, the success in the application courses, hand-eye-brain coordination, symbolic thinking skill, creativity, class harmony in the application courses, and participation in the social activities. Similar results were observed for the students of the fine arts high schools (Doğramacıoğlu, 2016). Milli and Yağcı (2017) indicated that the music department teacher candidates' communication skill was better than the students of the other departments. Similarly, Otacıoğlu (2007) found that the music department teacher candidates demonstrated a higher level of problem-solving skills than the GPC department teacher candidates. In contrast to these studies, a study in India on teacher candidates found a significant difference between science teacher candidates' life skills and art teacher candidates in favor of science teacher candidates (Pal & Chandra, 2019). Bhardwaj (2013) found that student teachers from the science stream had better composite life skills than the ones from the arts stream. The research results of Balaman et al. (2018), who compared the life skill levels of university students and pedagogical formation students, revealed that the life skill levels of the pedagogical formation students were significantly higher than the ones of the undergraduate students. Göksün and Kurt (2017) stated that the usage of 21st-century learning skills and the 21st-century teaching skills of the teacher candidates varied according to their universities and departments; and this might be caused by the department's HEIE admission threshold score & HEIE score type, the learning life of the teacher candidates in the universities, and other factors like different professors and course contents. Studying in different departments create differences in the life skills of the teacher candidates. This result indicates a need for longitudinal studies on the factors that may affect life skills, considering the attributes of both the departments and the teacher candidates who study there.

Since life skills have an impact on the prediction of many variables like success (Chien et al., 2012; Cronin et al., 2019; Erduran Avcı & Korur, 2019, June), metacognitive awareness (Zorlu et al., 2019), and self-efficacy (Koyuncu, 2018; Kozikoğlu & Altunova, 2018), it is vital to make students gain them from the early ages. One of the dominant factors in student's learning during the formal learning process is teachers. Therefore, it can be predicted that teacher candidates with highly developed life skills will contribute to the teaching-instruction process and the success of our students. Amutha and Ramganesh (2013) emphasize that teachers should gain and develop the life skills to use them in their personal and professional life. Simona (2015) emphasizes the need for vocational teachers and trainers for practical training and support activities in embedding the life skills in their specialties. In this context, courses, activities, and applications regarding life skills can be inserted into the teacher training programs (Amutha & Ramganesh, 2013; Pal & Chandra, 2019) and learning environments, that allow the candidates to integrate these skills into cognitive, affective, and psychomotor acquisitions, can be designed. This way, teacher candidates can attune the professional skills to daily life skills (Güneş & Uygun, 2016) and they can be supported in adopting these skills to the learning environments.

As with every research, there are several limitations for this study. The first limitation is related to the type of instrument used for the evaluation of life skills. We tried to limit the impact of this limitation by applying the steps in the development phase of the scale, providing the participants with adequate time and accompanying them during the data acquisition phase, and reminding the participants to read all items of the questions before making their markings. The second limitation is the fact that the instruments with closed-end questions rely on the honesty of the provided answers. Therefore, different measurement instruments may be merged in future studies that aim to evaluate young people's life skills (Jacobs Foundation, 2011). The third limitation is the varied distribution of the teacher candidates to the departments. Future studies can be conducted with relatively similar sample sizes according to the variables. This study's structure is not appropriate to reveal the cause-and-effect relations, which can be stated as the

last limitation. The longitudinal studies with different research designs may help determine the causality relations among the factors that impact life skills.

Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJATE belongs to the author(s).

Authorship contribution statement

Dilek Erduran Avcı: Investigation, Literature review, Research design, Data collection, Data analysis, and Writing the manuscript. **Sümeyye Turgut**: Investigation, Literature review, Methodology, Data collection, and Data analysis. **Fikret Korur**: Investigation, Methodology, Data analysis, Visualization, Software, and Writing the manuscript.

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6. APPENDIX

Life Skills Scale

Yaşam Becerileri Ölçeği

Sayın Katılımcı,

Bu ölçek yaşam becerilerini belirlemeye yönelik maddelerden oluşmaktadır. Sizden beklenen her maddeyi okuyup 1 ile 5 arası derecelerden birini işaretlemenizdir. Maddeleri içtenlikle işaretlemeniz araştırma sonuçları açısından oldukça önemlidir. Lütfen tüm maddeleri işaretleyiniz. Katkılarınızdan dolayı teşekkür ederiz.

1: En az katılıyorum……5: En çok katılıyorum

	1	2	3	4	5
Eleştirel Düşünme					
1. Kanıtlar yanıldığımı gösterdiğinde, düşüncelerimi değiştiririm.					
2. Bir olayı çeşitli açılardan değerlendirebilirim.					
3. Bir olay sonucunda doğabilecek riskleri değerlendirebilirim.					
4. Fikirlerimi, gerçekler ve deneyimler ile oluştururum.					
5. Kendimi geliştirmek için yaptığım her hareketi eleştiririm.					
6. Nedenleri ve kanıtları temel alarak bir durumu anlamaya çalışırım.					
Yaratıcı Düşünme					
7. Başkalarından fikir ve öneri alırım, ancak onlara inanmadan önce kendim analiz ederim.					
8. Bir işi farklı tarzda/yenilikçi yapmaktan hoşlanırım.					
9. İşlerimi dikkatli yapmaya özen gösteririm.					
10. Yeni şeyler yapmayı tercih ederim.					
11. Yeni fikirler üretirim.					
12. Başkalarından farklı düşünceler üretebilirim.					
13. Sorunlar karşısında kendi yenilikçi çözümlerimi oluştururum.					
14. Herhangi bir işi yapmanın birçok yolunu bulabilirim.					
15. Kendi özgün fikirlerimin peşinden giderim.					
16. Problemlerimi çözerken genellikle hayal gücüme başvururum.					
Karar verme ve problem çözme					
17. Kararlarımın sonuçları hakkında sorumluluk alırım.					
18. Sorunun tüm çözümlerini değerlendirip en iyisini seçerim.					
19. Karar almadan önce sorunun tüm yönlerini analiz ederim.					
20. Verdiğim kararların sonuçlarını tahmin edebilirim.					
21. Ne pahasına olursa olsun bir sorunun çözümünü bulmaya çalışırım.					
22. Bir karara varmadan önce tüm bakış açılarını dikkate alırım.					
23. Sorunlarımı çözerken ve önemli kararlar alırken deneyimlerimden yararlanırım.					
24. Kararlarım ya da çözümlerim işe yaramazsa tekrar gözden geçiririm.					
25. Karar almadan önce sonuçlardan nasıl etkileneceğimi düşünürüm.					
26. Karar almadan önce, başkalarını nasıl etkileyeceğini düşünürüm.					
27. Karar alırken önceliklerimi düzenleyebilirim.					
28. Bir problemi akıl yürüterek çözerim.					

Stresle ve Duygularla Başa Çıkma					
29. Stresle başa çıkmak için farklı yollar denerim.					
30. Olumsuz duygularımı çevremdeki insanlara yansıtmam.					
31. Olumsuz duygularla başa çıkabilirim.					
32. Stresi engelleyebilmek için bir plan dahilinde çalışabilirim.					
33. Stresi arttırabilecek mükemmeliyetçilik duygusundan vazgeçebilirim.					
34. Fikir çatışmalarımla başa çıkabilirim.					
35. Öfke ile baş edebilirim.					
36. Hayatımdaki herşey için olumlu düşünürüm.					
37. Durumlar karşısında kontrolsüz tepkiler vermem.					
38. Duygularımı uygun şekilde ifade ederim.					
39. Genellikle kaygı düzeyim düşüktür.					
Kişiler arası ilişki ve iletişim					
40. Amacıma uygun iletişim yöntemlerini seçmeye dikkat ederim.					
41. İletişim becerilerimi geliştirmek için çaba gösteririm.					
42. İnsanlarla kolayca iletişim kurabilirim.					
43. Konuşurken niyetimi çok açık bir şekilde ifade ederim.					
44. İnsanlarla konuşurken göz teması kurarım.					
45. Birisi konuşurken çok dikkatli dinlerim.					
46. İnsanlar benimle konuşurken rahat hisseder.					
Empati					
47. Başkalarının görüşlerini özgürce ifade etmelerine fırsat veririm.					
48. Kendimi karşımdaki bireyin yerine koyabilirim.					
49. Başkalarına yardım etmek için kendi sorumluluğumun farkındayım.					
50. Başkalarının hislerini anlayabilirim.					
51. Başkalarına yardım ettiğimde mutlu hissederim.					
52. Acı çeken birilerini gördüğümde kendimi kötü hissederim.					
53. Kimseyi incitmemeye çalışırım.					
Öz Farkındalık					
54. Sevdiğim şeyleri biliyorum.					
55. Duygularımın farkındayım.					
56. Kendi ihtiyaçlarımın farkındayım.					
57. Neleri başarabileceğimin farkındayım.					
58. Duygularımı uygun bir şekilde ifade edebilirim.					
59. Becerilerimi etkili bir şekilde kullanırım.					
60. Güçlü yönlerimi biliyorum.					
61. Sahip olduğum yetenekleri biliyorum.					
62. Yaptığım işleri/eylemleri değerlendiririm.					
63. İhtiyaçlarımı biliyorum.					
64. Hayatımın amaçları hakkında net bir fikrim var.					
65. Hak ve sorumluluklarımı biliyorum.					
Öz Saygı					
66. Birçok iyi özelliğe sahip olduğumu düşünüyorum.					
67. Kendi özelliklerimi seviyorum.					
68. Kendimi bütünüyle değerli hissediyorum.					

69. Birçok şeyi diğer insanlar kadar iyi yapabiliyorum.					
70. Birçok şeyi yapabileceğime inanıyorum.					
71. Hayatı değerli olarak görüyorum.					
72. Sahip olduklarımdan memnunum.					
73. Yaptığım işlerde kendime güveniyorum.					
Takım Çalışması					
74. Kendimden başka birinin yaptığı işe güvenmem.					
75. Takım çalışmalarında sorumluluk almaktan çekinirim.					
76. Takım çalışmalarında benden farklı düşünenlere tahammül edemem.					
77. Takım çalışmalarında "Her koyun kendi bacağından asılır." düşüncesini taşırım.					
78. Takımla çalışma ortamında kendi isteklerimi yaparım.					
Sosyal Sorumluluk					
79. Çevremi kirlettiğimde kendimi suçlu hissederim.					
80. Topluma faydalı işlerde gönüllü olmak isterim.					
81. Bencil davrandığımda kendimi suçlu hissederim.					
82. Birlikte çalıştığım grup başarısız olduğunda suçlu hissederim.					
83. Davranışlarımdan ötürü başkaları sorun yaşarsa kendimi kötü hissederim.					