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TALENT MANAGEMENT IN EDUCATIONAL ORGANIZATIONS: A SCALE DEVELOPMENT STUDY

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Abstract:
In this study researchers aim to develop a valid and reliable talent management scale for educational organizations. For this aim the sample of the study involves 784 principals, vice principals and teachers who work in different schools and provinces in Istanbul in 2014-2015 academic year. Data was analyzed in eight steps by using quantitative methods; a) explanatory factor analysis for unidimensionality of each of the factors; b) exploratory factor analysis for providing two dimensional factor structures; c) exploratory factor analysis for all factors to provide six dimensional factor structure; d) confirmatory factor analysis for each single factor; e) confirmatory factor analysis for six dimensional model; f) evaluating discriminant validity of the scale; g) assessing Cronbach alpha and Omega coefficients for the reliability; h) and providing measurement invariance into subsamples. All of these stages' results showed that this talent management scale for educational organization is valid and reliable.

Keywords: talent management, educational organizations, scale, teachers, validity, reliability

1. Introduction

In recent years, societies mainly depend on educational organizations for protecting their continuity, long or short term plans, getting a foothold in globalizing world and

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leading competition among others. Ever-increasingly connection between societies has forced educational organizations or schools to strengthen their organizational structure with highly performing talented members (Tabancali & Korumaz, 2014). The needs for talented members of schools have created an unprecedented competition. This competition picked a war among schools. And scholars called that "war for talent". The war for talent is a term coined by Steven Hankin of McKinsey and Company in 1997. It refers to an increasingly competitive landscape for recruiting and retaining talented employees. Naturally, administrative efforts are expected to focus on human and human resources in the context of organizational competition. Schools use cognitive and emotional capitals of their members who create eigenvalue for gaining a foothold in the competition (Baudreau & Ramstad, 2005; Reed & De Fillippi, 1990). In the course of the time it turns out that all of the factors such as financial or structural belongings that provide competitive advantages can easily be replicated by others except for talented members. Schools as organizations seek to solve the problems of globalization and the emergence of new administrative models, they define their employees as the critical source of differentiation (Ringo et al., 2008). Therefore, educational organizations or schools have converged to create a new human resources management perspective focusing on talented members.

As different from classical human resources management (HRM), talent management is concerned with attracting, recruiting, retaining and career development of talented members by using designed methods, processes, resources and policies (Gay & Sims, 2006). Talent management involves renovation of organizational goals, defining key positions, competitive wages policy, job enhancement strategies, performance management and career development (Atli, 2012; Devine & Powell, 2008; Khatri et al., 2010; Tabancali & Korumaz, 2014). Defining organizational goals and strategies (DOGS) refers long range intentions for operating and its overall philosophy that can provide useful guidance for talented members. Determining key positions (DKP) means exerting critical influence on the operational activities or the strategic objectives of the organization (Rothwell 2001). Attracting talents and talent pool (ATTP) refers giving the talents reasons to become in the organization and forming a talent pool both from in and out of the organization. Training and enhancement (TE) involves activities to strengthen and enhancing skills of talented members (Davies & Davies, 2011). Performance evaluation (PE) means supporting talented members by giving feedback about their performance indications. Career development (CE) involves some ways for talented individuals to plan to proceed (Claussen et al., 2014). All of these dimensions can be put together to explain what talent management consists.

The meanings of concepts, terms and contexts are continuously evaluating in organizational literature. Recent studies on talent management have proved that HRM fall into power in this decade for schools (Devine & Powell 2008; Khatri et al., 2010). Indeed studies have collected enough knowledge about the definition of talent management in educational organizations (Davies & Davies, 2011; Devine & Powell, 2008; Gay & Sims, 2006; Riccio, 2010; Sivenko, 2008). Studies have investigated not only the filling of top-management positions of organizations, but also the staffing of key positions at lower hierarchical levels (Claussen et al., 2014; Collings & Mellahi, 2009). But a few of these studies focused on evaluating the degree of talent management implementations. Some other studies in the context of education show that school districts often do little to strategically hire and keep talented teachers (DeArmond et al., 2012; Levin & Quinn, 2003; Levin et al., 2005; Liu & Johnson, 2006; Rebore, 2001; Smylie et al., 2004; Weisberg et al., 2009). Therefore, researchers in this study aim to develop a valid and reliable scale that determines the level of talent management in educational organizations.

2. Material and Methods

2.1 Research Sample

The sample of the study comprised 784 principals, vice principals and teachers working in 100 different schools in İstanbul over the period 2014-2015 fall semester. Participants were selected as convenient to random sampling logic. The participants of the study who work both in private and public schools were determined according to cluster sampling that is one of the most common types of random sampling (Yamane, 1967). There are different thoughts about ideal numbers of participants for analyzing factors and scale development study. For instance 500 participants can be accepted as "very good" for factor analysis (Comrey & Lee, 1992; MacCallum et al. 1999: 84). According to another perspective focuses on the ratio between number of items and participants (Hair et al., 2010). This perspective suggests item participant ratios of 1:20, 1:10 or 1:5 (Arrindell & Van der Ende, 1985). The sample of this study with 784 participants can be categorized as "very good" for both of the perspectives.

The sample is composed of 483 (%61,6) female and 301(%38,4) male. 564 (%71,9) of the participants teach or service in public schools while 220 (%28,1) of them teach or service in private schools. 692 (%88,3) of the participants are teachers, 73 (%9,3) of them are vice principals and 19 (%2,4) of them are school principals. In view of the graduation 647 (%82,5) of the participants were graduated from an undergraduate program and 137 (%17,4) are graduated from a master or doctoral program.

2.2 Pilot Study

Researchers made use of three different sources to create a comprehensive item pool; related literature, focus group interviews and expert opinion. Researchers first scrutinized the literature of talent management and education. Then two focus group interviews including two different groups (5 and 4 participants) of teachers provided new and holistic perspective about the items. Researchers added new items to the item pool with the codes and themes from these focus group interviews. Researcher also sent items to five experts studying on human resources management and educational administration to get their opinion. Finally item pool involving 146 items was formed. Final items were revised according to expert opinion again and 23 items were excluded from the item pool according to the opinions of the experts. Then these items were examined by Turkish Language experts. Apart from the study sample, 167 teachers from different schools in İstanbul attended in the pilot study voluntarily. Data was collected in pilot study in which scale with 123 items was used. This data was analysed to prove seven factored structure of the scale. In the first step, researchers analysed the unidimensionality with explanatory factor analysis. Some of the items disrupting unidimensional structure or with low factor load were excluded from the scale. In the second step researchers applied explanatory factor analysis 21 times in seven dimensions for proving two dimensionality of the scale. Some of the items restraining simple structure of the scale or with a high factor complexity and higher factor load in two different factor in the same time were excluded. All of the items in each of the factors were also tested for reliability and item total correlation. Cronbach alpha reliability coefficient was found between 0.894 and 0.950 for all of the factors. At the end of the plot study 51 items were excluded from the item pool and researcher decided to collect main data with the scale consisting of 72 items. Scale is designed as 5 point Likert scale.

2.3 Data Analysis

Data was analysed in 8 steps. Before conducting EFA in these steps, KMO measures showed excellent sampling adequacy and Bartlett Sphericity tests implied compatibility of data for factor analysis. In the first step, unidimensionality was assessed for each factor using exploratory factor analysis. Exploratory factor analysis with Promax rotation was used to explore two dimensional models in the second step. 5 items with the same factor load in different factors were excluded after Promax rotation. In the third step, all factors are analysed via exploratory factor analysis. As a result, the factor named as “retention and recruitment” was excluded from the scale. In addition, 3 items of “training and development” and 2 items of “performance evaluation” were excluded

because of high level of factor complexity. In the fourth step, confirmatory factor analysis was applied for each single factor based on covariance matrix and ML estimation method. All of the factors confirmed the unidimensional model. In the fifth step covariance matrix and ML estimation methods were used for confirmatory factor analysis of six dimensional models. Researchers also evaluated discriminant validity for each of the factors. And discriminant validity was provided in the sixth step. Adjusted item total correlation was examined. Then they calculated Cronbach Alpha, Guttmann split-half, and McDonald omega (ω) coefficients for assessing factor reliability. It was reached that reliability values are quite high for all of the factors in seventh step. In the final step, the researchers divided research sample into two sub-samples randomly. After they conducted explanatory and confirmatory factor analysis for each subsample, then they used multiple group confirmatory factor analysis for assessing scale invariance.

3. Findings

3.1. Exploratory Factor Analysis

3.1.1. Explanatory factor analysis for unidimensionality of each of the factors

Researchers conducted exploratory factor analysis with principal components extraction method. In each of the factor analysis, first eigenvalue was found to be higher than 1 and second eigenvalue is lower than 1. Kaiser-Guttmann's eigenvalue >1 rule indicated unidimensionality. It was found out that total variance explained by the factors varies between %62,25 and %73,58, and all above %60. Researchers also examined communality value for each items in each of the factor models and found no value lower than 0.50 indicating that over half of the variance of items are explained by related factor. Among the all factor loadings, 0.712 was the minimum.

3.1.2. Explanatory factor analysis for two dimensionality of each of the factor pairs

Researchers conducted explanatory factor analysis using principal components factor analysis and Varimax rotation for each of the factor pairs. Researchers conducted 21 times factor analysis for the scale with seven dimensions. Researcher excluded one of the items (item 17) from the scale because the item has similar factor loadings both in the factors of "determining key positions" and "attracting talents and talent pool". For the pair of factors of "retention and recruitment" and "career development" four of the items (56, 57, 58, 59) were excluded from the scale because they had high factor loadings in the unrelated factor. At the same in each of these 21 times factor analysis, first two eigenvalues were found higher than 1 and remaining eigenvalues were lower than 1.

The total variances accounted for the two factors models were ranged between %63,785 and %73,852.

3.1.3. Explanatory factor analysis for all of the dimensions

Researchers conducted explanatory factor analysis with principal components factor analysis and Promax rotation for total of 67 items in all of the dimensions. As suggested by Tabachnick and Fidell (2007), researchers first implemented Promax rotation and they found factor correlations higher than 0.32. This threshold of 0.32 refers that at least %10 of the variance of a factor can be explained by one another factor. Therefore, researchers preferred to use Promax rotation which is one of the oblique rotations allowing factors to be correlated. Besides, according to theoretical background of talent management, correlated factors seem acceptable. With the examination of factor loadings and cross-loadings for the items on the factors of retention and recruitment, factor loadings for all of these items were revealed very similar and high in magnitude. Finally, researchers decided to remove similar factor of retention and recruitment from the scale. And researchers also excluded 3 items (33, 34 and 35) from training and enhancement and 2 items (42 and 43) from performance evaluation because of high level of factor complexity.

At the end of this step, researchers decided to exclude 17 items from the scale which had included 67 items in the beginning and, to shorten the scale with 50 items. And researchers conducted explanatory factor analysis to these 50 items with principal components factor analysis and Promax rotation. Kaiser-Meyer-Olkin values were found 0.977 indicating “excellent” sampling adequacy (Hutcheson & Sofroniou, 1999; Field, 2009). Bartlett's Sphericity test was conducted to test the null hypothesis of population correlation matrix is equal to identity matrix. Rejecting the null hypothesis (Chi-square=37091.02, d.f=1225, p=0.000), correlation structure of the items was convenient for factor analysis.

The first six eigenvalue higher than 1 and the remaining lower 1 supported 6 dimensional structure according to the Kaiser’s eigenvalue >1 rule. 6 dimensional structure explains %70,914 of the total variances. Because the first stage of the Promax rotation supports bipolar structure, the result of this rotation resembles Varimax rotation. Because of running the oblique rotation, researchers should consider both structure and pattern loadings given in table 1. While structure loading refers correlation between an item and related factors, pattern loading can be interpreted as standardized partial regression coefficients.

Table 1: Factor loadings and communality values

Items	Pattern Loadings						Structure loading	Communality
	Factors							
	CD	DOGS	ATTP	TE	DKP	PE		
i67	**,913**						,839	,712
i69	**,853**						,873	,768
i70	**,844**						,859	,744
i71	**,842**						,849	,725
i66	**,838**						,815	,668
i64	**,817**						,848	,721
i62	**,792**						,850	,727
i65	**,783**						,837	,707
i61	**,759**						,842	,719
i60	**,753**						,774	,613
i63	**,752**						,822	,679
i72	**,732**						,842	,718
i68	**,727**						,839	,712
i2		**,892**					,840	,717
i1		**,870**					,812	,669
i3		**,859**					,842	,730
i4		**,841**					,835	,709
i6		**,757**					,822	,681
i5		**,746**					,776	,609
i7		**,683**					,753	,580
i9		**,652**					,741	,573
i8		**,650**					,731	,568
i10		**,592**					,722	,566
i19			**,903**				868	,763
i21			**,863**				,853	,730
i22			**,841**				,869	,761
i20			**,838**				,883	,787
i24			**,732**				,843	,720
i23			**,725**				,822	,709
i18			**,723**				,828	,720
i25			**,661**				,823	,697
i27				**,829**			,822	,794
i28				**,825**			,904	,822
i30				**,790**			,877	,778
i31				**,787**			,868	,766
i29				**,777**			,892	,807
i26				**,735**			,841	,720
i32				**,733**			,837	,714
i13					**,865**		,836	,709
i12					**,780**		,836	,640
i15					**,757**		,836	,725
i14					**,716**		,805	,691
i16					**,715**		,779	,625
i11					**,652**		,728	,580
i39						**,869**	,903	,818
i40						**,855**	,892	,801
i38						**,837**	,894	,805
i41						**,787**	,873	,774
i37						**,667**	,838	,727
i36						**,567**	,793	,671

According to their pattern loadings, it was seen that each of the item has high loading into related factor but low cross loading. Cut-off values for factor loadings were defined

as 0.32 (weak), 0.45 (reasonable), 0.55 (good), 0.63 (very good) and 0.71 (excellent) (Tabachnick & Fiddell, 2007; Comrey & Lee, 1992). So it is concluded that factor loadings in this study were between very good and excellent. Besides, it is recommended that item should have higher than 0.30 factor loading on related factor while it should have lower than 0.30 cross loading (Comrey & Lee, 1992). In this study it was found that all of the items had nearly almost zero cross loading. These results indicated simple structure that was one of the aims of the factor analysis (Thurstone, 1947). Structure loadings of 50 items were between 0.72 and 0.90. All of the items' structure loadings were higher than 0.71. This means that more than half of the variance was explained by that factor. One of the aims of the factor analysis is to explain variability of the items via common factors therefore the items has lower than 0.20 communality should be excluded from the scale (Child, 2006). In this study all of the items have higher communality values than recommended by Child (2006). As a result of Promax rotation, factor correlations given in table 2 were between 0.506 and 0.726. It should be noticed that these values were higher than 0.32 recommended by Tabachnick and Fidell (2007).

Table 2: Correlation matrix for the factors

Factors	CD	DOGS	ATTP	TE	DKP	PE
CD	**1.000**					
DOGS	.549	**1.000**				
ATTP	.693	.519	**1.000**			
TE	.726	.549	.707	**1.000**		
DKP	.555	.569	.618	.579	**1.000**	
PE	.720	.506	.626	.662	.569	**1.000**

In view of the high level of loading on related factors of the items according to pattern and structure loadings, indicated convergent validity for these items and factors. Besides the results of examining cross loadings showed that discriminant validity is provided. It is possible to state that via both convergent and discriminant validity, researchers provided the construct validity of the scale.

3.2. Confirmatory Factor Analysis (CFA)

3.2.1. Confirmatory factor analysis for unidimensionality of each of the factors

The researcher ran confirmatory factor analysis (CFA) for each of the six factors for confirming unidimensionality for each of the factors. Coefficients of skewness and kurtosis were used to investigate validations of normality assumption. In view of the coefficients of skewness and kurtosis of the all items are less than <1 in absolute value. Lei and Lomax (2005) states that skewness and kurtosis values less than <1 indicate

weak violations from normality. The researchers preferred to use maximum likelihood estimation (MLE) based on covariance matrix.

The factor loadings of each of the estimated models for unidimensional structures were found to be significant at 0.01 level. Besides R2 of all of the items were higher than 0.45. In examination of goodness of fit index for unidimensional CFA models, the researchers used RMSEA, Normed Fit Index (NFI), Non-Normed Fit Index, Comparative Fit Index (CFI) and Standardized RMR (SRMR). All of the factors with the items were found to be acceptable in terms of model fit. As a result, unidimensionality for each factors were confirmed by CFA and researchers don't need to exclude any of the items.

3.2.2. Confirmatory factor analysis with all of the factors, model fit, convergent validity and AVE (Average Variance Extracted) values

The researchers ran confirmatory factor analysis using MLE estimation method based on covariance matrix to confirm six dimensional structures which was reached via explanatory factor analysis. Although modification indices offer correlation between some items' error variances, the researchers didn't make modification on proposed scale as they are not grounded from the theory. Goodness of fit index for proposed model was compared to cut-off values and a good fitting model was found (χ2=4737.83, d.f.= 1160, χ2/d.f.= 4.08, RMSEA= 0.068, SRMR= 0.038, NFI= 0,98, NNFI= 0.98, CFI= 0.99). Hu and Bentler (1999) recommended using two index combinations like SRMR with NNFI (TLI) or RMSEA with CFI to examine model fit evaluation. Goodness of fit index values was found in some combinations according to Hu and Bentler's rationale of two-index strategy such as (Hooper, Coughlan & Mullen, 2008); SRMR ≤0.09 and NNFI ≥0.96, SRMR ≤0.09 and RMSEA ≤ 0.06 or SRMR ≤0.09 ve CFI ≥ 0.96. In this research, 6 dimensional structures were found and these values indicated that model showed good fit.

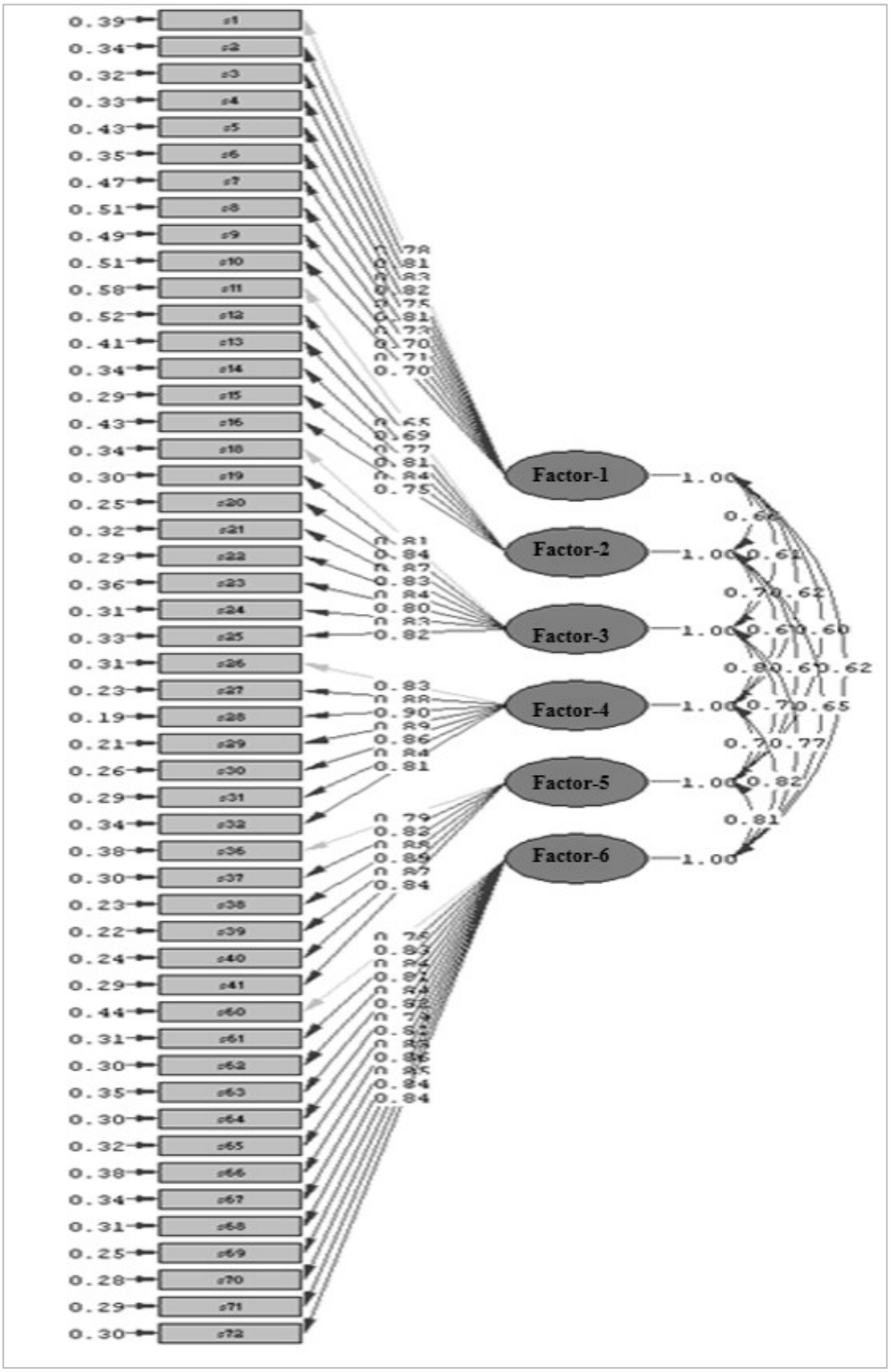

Figure 1: Path diagram for the model with standardized estimations

Table 3: Results from the measurement model

Factor	Item	Unstandardized factor loadings	Standardized factor loadings	Standard Error	t	R^2
Defining organizational goals and strategies (DOGS)	i1	1*	0,78	-	-	0.61
	i2	1.02	0,81	0.04	25.06	0.66
	i3	1.04	0,83	0.04	25.54	0.68
	i4	1.04	0,82	0.04	25.18	0.67
	i5	1.04	0,75	0.05	22.75	0.57
	i6	1.01	0,81	0.04	24.75	0.65
	i7	0.97	0,73	0.04	21.78	0.53
	i8	0.89	0,7	0.04	20.92	0.49
	i9	0.97	0,71	0.05	21.28	0.51
	i10	0.92	0,7	0.04	20.70	0.49
Determining key positions (DKP)	i11	1*	0,65	-	-	0.42
	i12	1.04	0,69	0.06	16.90	0.48
	i13	1.19	0,77	0.06	18.49	0.59
	i14	1.39	0,81	0.07	19.28	0.66
	i15	1.35	0,84	0.07	19.82	0.71
	i16	1.17	0,75	0.06	18.20	0.57
Attracting talents and talent pool (ATTP)	i18	1*	0,81	-	-	0.66
	i19	1.03	0,84	0.04	27.96	0.70
	i20	1.03	0,87	0.04	29.42	0.75
	i21	0.99	0,83	0.04	27.33	0.68
	i22	1.02	0,84	0.04	28.04	0.71
	i23	0.97	0,8	0.04	26.21	0.64
	i24	1.00	0,83	0.04	27.59	0.69
	i25	1.02	0,82	0.04	27.12	0.67
Training and enhancement (TE)	i26	1*	0,83	-	-	0.69
	i27	1.06	0,88	0.03	31.24	0.77
	i28	1.08	0,9	0.03	32.58	0.81
	i29	1.06	0,89	0.03	31.97	0.79
	i30	1.01	0,86	0.03	30.42	0.74
	i31	1.04	0,84	0.04	29.27	0.71
	i32	1.00	0,81	0.04	27.59	0.66
Performance evaluation (PE)	i36	1*	0,79	-	-	0.62
	i37	1.10	0,83	0.04	26.39	0.70
	i38	1.16	0,88	0.04	28.28	0.77
	i39	1.17	0,89	0.04	28.66	0.78
	i40	1.12	0,87	0.04	27.95	0.76
	i41	1.10	0,84	0.04	26.70	0.71
Career development (CD)	i60	1*	0,75	-	-	0.56
	i61	1.14	0,83	0.05	24.85	0.69
	i62	1.16	0,84	0.05	25.15	0.70
	i63	1.13	0,81	0.05	24.09	0.65
	i64	1.17	0,84	0.05	25.07	0.70
	i65	1.17	0,86	0.05	24.66	0.68
	i66	1.13	0,79	0.05	23.48	0.62
	i67	1.17	0,81	0.05	24.25	0.66
	i68	1.23	0,83	0.05	25.00	0.69
	i69	1.22	0,86	0.05	26.07	0.75
	i70	1.17	0,85	0.05	25.62	0.72
	i71	1.16	0,84	0.05	25.23	0.71
	i72	1.22	0,84	0.05	25.20	0.70

The t values of all of the coefficients were found to be higher than 2.60 and significant at 0.01 level. Standardized coefficients were higher than 0.50 which is recommended value and some of them were even higher than 0.70 which is ideal (Anderson & Gerbing, 1988; Hair et al., 2010). R2 indicates the ratio of explained variance by the related factor to total variance for an item and reliability at item level. R2 values of the each item are between 0.42 and 0.81, only two of the items (item11 and 12) were below 0.50. This 0.50 means at least the half of the variance of the item is explained by the related factor. Another strategy for testing convergent validity is AVE (Average Variance Extracted) recommended by Fornell and Lacker (1981). AVE can be defined as the average amount of variance in observed variables which a latent construct can be explained, and shared variance is the amount of variance in observed variables relating to another construct that a latent construct is able to explain. If the AVE for each construct is greater than its shared variance with any other construct, discriminant validity is supported. AVE values were calculated for six factors using the estimations from CFA and given in table 4. AVE values were between .57 and .74 and they are higher than .50 as recommended by Fornell and Lacker (1981).

Table 4: Average variance extracted (AVE) results

Factor	AVE
Defining organizational goals and strategies	0,59
Determining key positions	0,57
Attracting talents and talent pool	0,69
Training and enhancement	0,74
Performance evaluation	0,72
Career development	0,68

As the coefficients were all significant, high in terms of magnitude and consistent with the theory in terms of their directions, as well the AVE values were all found as desired. Further, as shown under the headings four, all the factors were highly reliable. In view of these gained information it is possible to say that convergent validity of the scale was provided assessing factor loadings and AVE values.

3.3. Discriminant Validity

CFA alone may not be enough to prove discriminant validity. Researchers used 3 different strategies to test discriminant validity;

1. Investigating factor loadings of explanatory factor analysis and cross-loadings for finding out range between two of these values.

2. Using chi-square difference test. Anderson and Gerbing (1988) stated that the parameter for two factors be constrained to 1 (constrained model) and compared to a

model in which this parameter is freely estimated (unconstrained model). The researchers then run this analysis for all of the factor pairs. If unconstrained model return a chi-square value that is at least 3.84 lower than the constrained model, two factors provides a better fit to data. That means discriminant validity between two factors is provided.

3. The explanation rate of the total variances of the items of the related factor should be higher than correlation squares between two factors Fornell and Lacker (1981). For this study, correlations between factors are between 0.60 and 0.82 and they all are significant at the level of 0.01.

Table 5: Table for discriminant validity

	DOGS	DKP	ATTP	TE	PE	CD
DOGS	**0.77**					
DKP	0.66	**0.75**				
ATTP	0.61	0.74	**0.83**			
TE	0.62	0.67	0.80	**0.86**		
PE	0.60	0.67	0.72	0.78	**0.85**	
CD	0.62	0.65	0.77	0.82	0.81	**0.83**

Note: Diagonal values are square root AVE, values below are factor correlation

As stated in table 5, square root of AVE values for each of the factors were higher than the correlations between related factors. Therefore, it can be said that discriminant validity is provided by the scale.

3.4. Reliability of the Factors

The researchers considered corrected item total correlations, Cronbach Alpha coefficients, Guttman Split-Half coefficients, and Omega (ω) coefficients for reliability of the factors (McDonald, 1999). Corrected item total correlations ranged from 0.621 to 0.869.

Table 6: Corrected item total correlations and reliability coefficients for the factors

Factor	Items	Corrected Item total correlations	Internal consistency			Composite reliability
			Cronbach alfa	Alpha if item deleted	Guttmann split-half coefficient	McDonald omega
DOGS	i1	,737	,932	,925	,881	0,93
	i2	,778		,923		
	i3	,784		,923		
	i4	,781		,923		
	i5	,715		,927		
	i6	,781		,923		
	i7	,710		,927		

	i8	,687		,928		
	i9	,693		,928		
	i10	,674		,928		
DKP	i11	,621	,888	,881	,811	0,89
	i12	,675		,872		
	i13	,740		,862		
	i14	,730		,864		
	i15	,767		,857		
	i16	,687		,871		
ATTP	i18	,780	,946	,941	,912	0,95
	i19	,813		,939		
	i20	,843		,937		
	i21	,799		,940		
	i22	,817		,938		
	i23	,781		,941		
	i24	,809		,939		
	i25	,795		,940		
TE	i26	,795	,951	,947	,892	0,95
	i27	,852		,942		
	i28	,869		,940		
	i29	,859		,941		
	i30	,839		,943		
	i31	,828		,944		
	i32	,790		,947		
PE	i36	,754	,939	,935	,909	0,94
	i37	,805		,929		
	i38	,849		,924		
	i39	,853		,923		
	i40	,837		,925		
	i41	,805		,929		
CD	i60	,738	,965	,963	,930	0,97
	i61	,819		,961		
	i62	,828		,961		
	i63	,795		,962		
	i64	,821		,961		
	i65	,811		,962		
	i66	,781		,962		
	i67	,788		,962		
	i68	,809		,962		
	i69	,843		,961		
	i70	,821		,961		
	i71	,820		,961		
	i72	,817		,962		

George and Mallery (2003) however, provide the following rules of thumb: >.9 – Excellent, >.8 – Good, >.7 – Acceptable, >.6 – Questionable, >.5 – Poor and <.5 – Unacceptable. Upon computation, alpha, split-half, and omega (ω) higher than 0.70 (Nunnally 1978) for each of the factor were obtained. The scale was thus accepted as reliable.

3.5. Exploratory, Confirmatory Factor Analysis and Measurement Invariance into Subsamples

The researchers divided the sample involving 784 individuals into two half randomly. Each half involves 392 members. The aim of this division was to gain two equal subsamples to test measurement invariance. Scale invariance provided by randomly divided subsamples also supports validity of the scale.

Testing Configural Invariance: The researchers used EFA and CFA to test data of the randomly divided subsamples. 50 items and 6 dimensional structures were reached for both of the subsamples via EFA. The model containing these factors and items was confirmed via CFA. KMO value is 0.970 of the first subsample and 0.968 of the second subsample. Barlett Sphericity tests for both of the subsamples were significant at the level of 0.01. There were 6 factors eigenvalue of which were higher than 1. This six dimensional model explained %71.493 of the total variance. Similarly, second subsample involved 6 factors eigenvalue of which were higher than 1 and this six dimensional model explained %70.914 of the total variance. Predicted values of these two subsamples were close to each other.

Meanwhile the researchers' evaluated model fit for both of the subsamples based on "goodness of model fit index" for both. In other words, 6 dimensional measurement models were confirmed in these two subsamples. Investigating the goodness of fit index, they reached good fit for both. These results indicate configural invariance. After each of these two groups are modelled separately, another test for configural invariance is to model two of the groups in the same time without any equality constraint on parameters and determining the same model by using Multiple-Group confirmatory factor analysis. Two groups CFA defined as baseline model confirmed the model showing good fit to data. Therefore, researchers reached configural invariance. The researchers tested measurement invariance through the way recommended by Van de Schoot et al. (2012) after configural invariance was confirmed. So the researchers create four models just as Van de Schoot et al. (2012, p.5) suggested; In Model 1, only the factor loadings are equal across groups but the intercepts are allowed to differ between the groups. In Model 2, only the intercepts are equal across the groups, but the factor loadings are allowed to differ between groups. In Model 3, the loadings and intercepts are constrained to be equal. And in Model 4, the residual variances are also fixed to be equal across groups. Put more strongly, the latent construct is measured identically across groups. If the error variances are not equal, groups can still be compared on the latent variable, but this is measured with different amounts of error between groups.

Table 7: Goodness of fit index for invariance models

Model	Chi-Square	df	p	Chi-Square/df	RMSEA	NFI	NNFI (or TLI)	CFI
Baseline Model	6375.71	2320	0.0	2.75	0.071	0.97	0.98	0.98
Model 1	6402.89	2370	0.0	2.708	0.070	0.97	0.98	0.98
Model 2	6425.68	2370	0.0	2.711	0.070	0.97	0.98	0.98
Model 3	6452.92	2420	0.0	2.673	0.070	0.97	0.98	0.98
Model 4	6493.04	2470	0.0	2.635	0.069	0.97	0.98	0.98

With examination of the goodness of fit index for the models, all the models showed good fit to data indicating that adding constraints to the models didn't worsen the fit index. Furthermore, in comparisons of the model 1 and baseline model ($\Delta\chi^2$=27.18, d.f=50, p= 0.997); the model 2 and the baseline model ($\Delta\chi$2=49.97, d.f=50, p= 0.475); the model 3 and the model 1 ($\Delta\chi$2=50.03, d.f=50, p= 0.461); and the model 4 and the model 3 ($\Delta\chi$2=40.12, d.f=50, p= 0.838); chi square difference test indicated that the increases in chi square values for models were not statistically significant. Finally, the strict invariance was reached that the scale with 6 factors and 50 items can be applied to organizations in educational context.

4. Results

In this study, researchers developed "Talent Management Scale" for educational organizations that involve "defining organizational goals and strategies", "determining key positions", "attracting talents and talent pool", "training and enhancement", "performance evaluation", "career development" dimensions. The dimension of defining organizational goals and strategies means the reorganization of long and short term organizational aims, goals and strategies for initiating talent management process. Here are some examples of the items in this dimension: "My organization has achievable goals", "My organization's goals can be reorganized by talented administrators" and "Reaching a competitive advantage with talented administers is aimed in my organization". Another dimension is determining key positions which involve items for evaluating positions for talented members who will provide to reach organizational goals and aims. Some samples of the items in this dimension are: "In my organization, there are some positions for only talented members" and "Members in key positions can affect organizational strategies in my organization". The third dimension is attracting talents and talent pool which consists of items for attracting talented members who are suitable for the key positions and will support organizational competition. The sample items are: "There is a talent pool for collecting information of the talents" and "The talents in talent pool is predicted to become

administrator in the future". Next dimension is training and enhancement which means training and presenting enhancement conditions for the talents attracted for the organization. In this dimension, some sample items are: "My organization trains the talents according to their needs" and "The talented members can study abroad for professional development". Another dimension is performance evaluation which means evaluating performance of the talents and taking precautions according to their needs. Some sample items are: "Possibility of being administrator in the organization of talented members become stronger according to the results of performance evaluation" and "Criteria are determined to find out highly potential members among both workers and administrators" The last dimension is career development. This dimension involves statements about organizational efforts to support career developments of talented members. Some sample items are: "Career expectations of talented members are provided" and "The talents are supported to implement their career plans in my organization".

In the light of validity tests, it is indicated that the scale is a valid one. And Cronbach Alpha coefficients of the dimensions and the whole scale shows the reliability of the scale. At the end of the study, researchers developed a valid and reliable "Talent Management Scale" that allows to get knowledge about the level of talent management in educational organizations.

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