The Relationship between Effective Teacher Characteristics and Reasons for Choosing Teaching Profession: Development of an Effective Teacher Inventory

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Abstract: The main purpose of this study is to investigate the relationships between the opinions of secondary school teachers about effective teacher characteristics and their reasons for choosing the teaching profession. In this context, the study first intends to develop a measurement tool to identify effective teacher characteristics. The study is of a correlational research type. Data were collected from three different groups of secondary school teachers. The effective teacher characteristics inventory and the choosing teaching profession as a career scale were used to collect data. The data were analysed using the exploratory and confirmatory factor analyses, Cronbach Alpha internal consistency analysis and multiple linear regression. Given the limitations of the study, groups from which data were obtained, the results of the analyses have shown that the "Effective Teacher Characteristics Inventory" is able to make valid and reliable measurements for effective teacher characteristics under four independent scales (e.g., subject matter knowledge, teaching skills, personality characteristics and professional development). The multiple linear regression has demonstrated that the predictor variables in the model, subject matter knowledge, personality characteristics, and professional development are positive predictors for teaching skills. However, reasons for choosing the profession is not a significant predictor for teaching skills of teachers.

1. INTRODUCTION

Teachers have a significant role and responsibility in the success of an education system. Many studies in the literature have dealt with teachers. Teacher qualifications, effective teacher characteristics and teacher influence comprise a considerable portion of these. The present study focuses on effective teacher characteristics and reasons for choosing teaching as a profession (Griffin, McGaw, & Care, 2012; Metzlera, & Woessmann, 2012).

1.1. Effective Teacher

Although a general review of the literature involving studies on effective teaching would reveal presence of many studies taking the teacher as their theme, they show various differences with respect to their contexts, focal points, methods, and results. Being an important dimension of

effective teaching as well as the subject of this study, effective teacher characteristics are explained and discussed in the relevant body of literature under various subtopics such as *competency in subject matter knowledge, teaching skills, personality characteristics, and professional development*. All these characteristics have been the focus of various studies (Brophy, 2000; Cotton, 2000; Danielson, 2007; Gholam & Kobeissi, 2012; Goe, Bell & Little, 2008; Jones, Jenkin & Lord, 2006; Kyriakides, Campbell, & Christofidou, 2002; McArdle & Coutts, 2003; McEwan, 2002; Muijs & Reynolds, 2000; Polk, 2006; Saunders, 2000; Shindley Elliott, 2010; Stronge, 2007; Swainston, 2008; Tucker & Stronge, 2005; Woolfolk, 1998).

For subject matter knowledge, which has an important place among effective teacher characteristics, various terms have been used in the literature including good command of the subject matter concepts (Polk, 2006), knowledge of pedagogy (Polk, 2006; Tucker & Stronge, 2005), and knowledge of contents (Shulman, 1986). Woolfolk (1998) has pointed out the importance of the role of knowledge and clarity of the teacher's instructions, explanations, and presentations in students' learning. The relevant body of literature emphasizes a number of characteristics such as establishing a positive classroom setting, effective use of various teaching methods or techniques, presenting the subject by linking it to daily living (Tucker & Stronge, 2005), and coming prepared to classroom (McArdle & Coutts, 2003).

Some personal characteristics of an effective teacher are listed as follows (Kyriakides, Campbell, & Christofidou, 2002; Muijs & Reynolds, 2000; Stronge, 2007; Swainston, 2008; Tucker & Stronge, 2005): Geniality, consistence, self-confidence, honesty, appreciative of student views, ability to communicate effectively, positive attitude, having great expectations from students, accepting student feelings without judgement, setting an example for students, self-reliance, a flexible, creative and tolerant disposition, and a democratic attitude. There are also studies stressing the professional development of an effective teacher (Goe, Bell & Little, 2008; McEwan, 2002; Polk, 2006; Stronge, 2007). According to these studies, effective teachers believe in life-long learning, follow research studies in their profession, appreciate personal development, invest in their own education, and closely monitor opportunities in personal development such as in-service trainings, congresses, and conferences.

1.2. Reasons for Choosing Teaching Profession as a Career

Effective teaching is not limited to having necessary knowledge and skills; it also requires a positive attitude towards the profession and motivation (Heinz, 2015; Watt, Richardson & Wilkins, 2014). At this point, studies become important that deal with what motivates individuals to become a teacher, how they perceive the profession of teaching and what their expectations are from a career development. Studies have explained the reason for choosing teaching as a profession under three categories: a) Extrinsic reasons such as salary and long leaves, b) intrinsic reasons such as interest, personal experience and intellectual satisfaction, and c) altruism such as a desire to contribute to the development of other people (Brookhart & Freeman, 1992; Kyriacou & Coulthard 2000; Moran, Kilpatrick, Abbott, Dallat, & McClune, 2001). Yu (2011) has come up with a more comprehensive list of the factors affecting career choices of teachers including intrinsic, altruistic, and extrinsic reasons, perceived teaching skills, social effect, and teaching experiences.

The results shown by research studies on effective teacher characteristics have an important role in many respects such as teacher education, professional development and assessment of teachers (Stronge, Ward & Grant, 2011). In defining the knowledge and skills needed by teacher candidates, ensuring professional development, making valid and reliable assessments of teachers (Stronge, Ward, & Grant, 2011, p.339 as cited in Darling-Hammond & Bransford, 2005; Hanushek, 2008; National Academy of Education, 2008) and in many other context that can be listed, identification of effective teacher characteristics on the basis of teaching levels is important. Although there are many studies carried out at various levels in this subject in the

relevant literature (Gholam & Kobeissi, 2012; Keeley, Smith, & Buskist, 2006; Moran, 2005; Shindley Elliott, 2010), these studies have been conducted mostly with teacher candidates with limited number of studies dealing with this subject at primary and secondary school levels.

In the literature review, there is no study investigating the relationships between the effective teacher characteristics and the reasons for choosing teaching. It can be said that this situation inspired the research. The main purpose of this study is to investigate the relationships between the opinions of secondary school teachers on effective teacher characteristics and the reasons why they choose the teaching profession. In this context, the study first intends to develop a measurement tool to identify effective teacher characteristics.

2. METHOD

This study is structured as a descriptive research because it describes the features of the measuring tool under development and as a correlational research (Fraenkel, Wallen, & Hyun, 2012) in the sense that it questions the relationships between effective teacher characteristics and reasons for choosing the teaching profession.

2.1. Participants

The study data were obtained from three different groups. The first group consisted of teachers working at secondary school level (n=421). Data were collected from this participating group for the purpose of obtaining information about the construct validity and reliability level of the *Effective Teacher Characteristics Inventory* that was planned to serve as a measurement tool in this study. The second group was again formed of teachers working at secondary schools (n=403). Data were collected from this second group to test whether or not the construct of the *Effective Teacher Characteristics Inventory* as a measurement tool developed for this study is verified. The last group from which data were collected in the study consisted of secondary school teachers (n=321) and the data were collected from this group for the purpose of exploring the relationships between effective teacher characteristics and reasons for choosing the teaching profession. These three different groups were formed using the purposive sampling method, a sampling method for unknown probabilities. In non-probability sampling methods, the probability of selecting each person from the population to the sample cannot be calculated (Sumbuloglu & Sumbuloglu, 2005). Convenience sampling is based on working with a portion of the population, not the whole (Senol, 2012). When using convenience sampling, researchers determine the characteristics of those who will comprise the study population and try to reach the persons who have these characteristics. Some variables of the participants are shown in Table 1 and 2.

Table 1. *Distribution of teachers in exploratory factor analysis and confirmatory factor analysis groups according to various variables*

Group of exploratory factor analysis				Group of confirmatory factor analysis			
	Variable	f	%		Variable	f	%
Gender	Female	292	69,4	Gender	Female	290	72
	Male	129	30,6		Male	113	28
	Total	421	100		Total	403	100
Experience	1-5 years	10	2,4	Experience	1-5 years	8	2
	6-10 years	45	10,7		6-10 years	43	10,7
	11-15 years	124	29,5		11-15 years	110	27,3
	16-20 years	147	34,9		16-20 years	142	35,2
	21 years and over	95	22,6		21 years and over	100	24,8
	Total	421	100		Total	403	100
Graduated Faculty	Faculty of Education	315	74,8	Graduated Faculty	Faculty of Education	303	75,2
	Other	106	25,2		Other	100	24,8
	Total	421	100		Total	403	100

		f	%			f	%
	Turkish	90	21,4		Turkish	83	20,6
	Mathematics	56	13,3		Mathematics	49	12,2
	Science Education	56	13,3		Science Education	59	14,6
	Social Sciences	40	9,5		Social Sciences	37	9,2
	English	40	9,5		English	37	9,2
Subject Matter /Areas of Expertise	Psychological counseling and guidance	24	5,7	Subject Matter /Areas of Expertise	Psychological counseling and guidance	22	5,5
	Music	16	3,8		Music	18	4,5
	Visual arts	25	5,9		Visual arts	25	6,2
	Physical Education	13	3,1		Physical Education	13	3,2
	Technology Design	26	6,2		Technology Design	25	6,2
	Informatics/Information Technology	14	3,3		Informatics/Information Technology	14	3,5
	Theology	21	5		Theology	21	5,2
	Total	421	100		Total	403	100

The majority of teachers involved in scale development groups are women (69-72%). About half of the teachers have an experience of 11-20 years. Teachers from different subject matter/areas of expertise at secondary school level are included in this group.

Table 2. *Distribution of teachers in relational modeling groups according to various variables*

	Variable	f	%
Districts of Ankara where she/he works	Çankaya	54	16,8
	Mamak	51	15,9
	Yenimahalle	62	19,3
	Keçiören	51	15,9
	Altındağ	57	17,8
	Sincan	46	14,3
Gender	Female	220	68,5
	Male	101	31,5
Experience	1-5 years	15	4,7
	6-10 years	49	15,3
	11-15 years	93	29
	16-20 years	105	32,7
	21 years and over	59	18,4
Subject Matter /Areas of Expertise	Turkish	55	17,1
	Mathematics	48	15
	Science Education	45	14
	Social Sciences	36	11,2
	English	25	7,8
	Psychological counseling and guidance	22	6,9
	Music	17	5,3
	Visual arts	16	5
	Physical Education	21	6,5
	Technology Design	12	3,7
	Informatics/Information Technology	10	3,1
	Theology	14	4,4
	Total	321	100

2.2. Data Collection Instruments

Two different data collection tools were used in this study. The first of these data collection tools, the "*Effective Teacher Characteristics Inventory*" has been developed by the researchers. A pool of items was constructed as the first step in developing the inventory. When creating

this pool, information obtained from the literature and information obtained as a result of the Delphi process that was conducted by the investigators were used. During the Delphi study, the question "What are effective teacher characteristics?" was asked to 139 teachers working at secondary schools, 402 secondary school students and 204 students from faculties of education. Additionally, opinions of 14 teacher educators working at various universities were obtained. The effective teacher characteristics stated by all participants were listed as a result of a content analysis. The characteristics listed were first sent to a group of four experts from the field of Curriculum & Instruction and one from the field of Guidance & Psychological Counselling and their views on the characteristics were obtained. The final version of the effective teacher characteristics that were corrected and redesigned based on the views received were sent again to the same experts by mail. After taking the latest suggestions into consideration, the item pool for effective teacher characteristics was finalized and then administered. The groups that collected data in the Delphi process, the groups where data was collected to scale development process, and the group where data was collected for relationship analysis were formed from different participants.

As a result of Delphi process and expert opinions, a list of effective teacher features consisting of 80 items was reached. 80 items formed the item pool to develop the scale. These items are structured in likert type before being implemented. As explained in detail in the results/findings section, an inventory of 25 items and four independent scales was obtained from the 80 items pool.

"*Effective Teacher Characteristics Inventory*" is able to make valid and reliable measurements for effective teacher characteristics under four independent scales (subject matter knowledge, personality characteristics, professional development, and teaching skills). Subject matter knowledge is a scale of four items. The lowest score that can be obtained from this scale is 4, the highest score is 20. Personality characteristics is a scale of seven items. The lowest score that can be obtained from this scale is 7, the highest score is 35. Professional development is a scale of 4 items. The lowest score that can be obtained from this scale is 4, the highest score is 20. Teaching skills consist of three sub-scales and 10 items. The lowest score that can be obtained from this scale is 10, the highest score is 50.

The other measurement tool used in the study was the "Choosing Teaching Profession as a Career Scale". The Choosing Teaching Profession as a Career Scale was developed by Lai, Chan, Ko, & So (2006) and adapted to Turkish by Balyer & Ozcan (2014). The Turkish version of the scale shows that the scale consists of 20 items and 3 subdimensions. These 3 subscales are: "Altruistic/intrinsic reasons, extrinsic reasons and influence of others". Balyer & Ozcan (2014) conducted their study with a total of 1410 faculty of education students from 8 different state universities and 220 students took part in performing the validity and reliability analyses. The CFA results of the Turkish version of the scale were; X^2/sd=2,3, GFI=0,90, AGFI=0,80, NFI=0,95, NNFI=0,95, CFI=0,92, RMR=0,10, RMSEA=0,08, and SRMR=0,09, which were at an acceptable level according to the literature. The Cronbach alpha coefficients of the scale were 0.91 for the altruistic/intrinsic reasons subdimension, 0.80 for the extrinsic reasons subdimension and 0.74 for the influence of others subdimension. Since the scale, which had been adapted by Balyer & Ozcan for teacher candidates, was meant to be used for secondary school teachers in this study and its target population changed, it was separately tested on secondary school teachers (n=321) who would be subject to the last administration in this study to show if it would work with the same structure on teachers. This testing was done with CFA. The fit indices obtained were RMSEA=0,077, RMR=0,022, GFI=0,951, AGFI=0,904, NFI=0,911, IFI=0,918, CFI=0,956, and X^2/sd=2.87, which were within the limits of acceptable values. Cronbach Alpha value is the basis for the reliability of the scale as internal consistency. When the Cronbach alpha reliability coefficients of the scale were calculated, the reliability

coefficients for the teacher version were found to be 0.89 for the altruistic/intrinsic reasons subdimension, 0.77 for the extrinsic reasons subdimension and 0.76 for the influence of others subdimension.

2.3. Data Analysis

Missing values were not found in the data file. Therefore, it was decided to apply factor. The principles competent method was used in the factor analysis. Whether the data set was suitable for a factor analysis was tested with Kaiser Meyer Olkin (KMO) and Bartlett's Test of Sphericity value. KMO is a criterion relating to the sufficiency of sampling. The KMO statistic ranged between 0 and 1. A KMO value less than 0.500 is usually unacceptable and may necessitate collection of more data. Values between 0.500 and 0.700 are accepted as moderate, between 0.700 and 0.800 as good, between 0.800 and 0.900 as very good and those over 0.900 as excellent (Cokluk, Sekercioglu & Buyukozturk, 2010; Field, 2018; Tabachnick & Fidell, 2013). The Bartlett's Test of Sphericity tests whether the variance-covariance matrix is proportional to a defined matrix. If the test result is significant, it is considered as a global and multivariate normality. However, a disadvantage of this test is that it is influenced by the sample size. With larger samples, the probability of the result to turn out significant increases (Cokluk, Sekercioglu, & Buyukozturk, 2010; Tabachnick & Fidell, 2013). The fit indices in the analysis results obtained for the confirmatory factor analysis (CFA) were reviewed. The results of the fit indices searched in the literature as reference are shown in Table 3.

Table 3. *Fit index reference values accepted for CFA*

Fit-index	Acceptable Limits	Perfect Fit Limits	Source
RMSEA (Root mean Square Error of Approximation)	$0.05 \leq RMSEA \leq 0.08$	$0 \leq RMSEA \leq 0.05$	Hooper, Coughlan, & Mullen, 2008; Hu, & Bentler, 1999; Simsek, 2007; Vieira, 2011
RMR (Root Mean Square Residual)	$0.05 < RMR \leq 0.08$	$0 \leq RMR \leq 0.05$	Anderson, & Gerbing, 1984; Hooper, Coughlan, & Mullen, 2008; Hu, & Bentler, 1999; Kline, 2005; Marsh, Balla, & McDonald, 1988
GFI (Goodness of Fit Index)		0.90 and over	Hooper, Coughlan, & Mullen, 2008; Kline, 2005
AGFI (Adjusted Goodness of Fit Index		0.90 and over	Anderson, & Gerbing, 1984; Hooper, Coughlan, & Mullen, 2008; Kline, 2005; Marsh, Balla, & McDonald, 1988
NFI (Normed Fit Index)		0.95 and over	Bentler, 1990; Cokluk, Sekercioglu, & Buyukozturk, 2010; Hu, & Bentler, 1999; Kline, 2005; Simsek, 2007
IFI (Incremental Fit Index)	$0.90 \leq IFI \leq 0.94$	0.95 and over	Bentler, 1990; Cokluk, Sekercioglu, & Buyukozturk, 2010; Hu, & Bentler, 1999; Simsek, 2007
CFI (Comparative Fit Index)	$0.90 \leq CFI \leq 0.94$	0.95 and over	Bentler, 1990; Cokluk, Sekercioglu, & Buyukozturk, 2010; Hooper, Coughlan, & Mullen, 2008; Hu, & Bentler, 1999; Simsek, 2007
X^2/sd	$2 < X^2/sd \leq 5$	$0 \leq X^2/sd \leq 2$	Kline, 2005; Ozdamar, 2016; Tabachnick, & Fidell, 2013

The regression analysis was planned to be performed with a "*Multiple Linear Regression*" (Ozdamar, 2013). For this reason, the normality of data distribution was tested. A Kolmogorov Smirnov normal distribution test showed that the data were not normally distributed ($p<.05$). Tests testing normality are excessively sensitive (Tabachnick, & Fidell, 2013). In many studies (especially in social sciences), measurements of dependent variables do not show normal distribution (Pallant, 2016). The Central Limit Theorem argues that if the sample is sufficiently large (n=30+), the distribution of means in the sample will be normal regardless of the distribution of variables and a violation of normal distribution will not cause a big problem (Everitt, & Howell, 2005; Field, 2018; Pallant, 2016; Tabachnick, & Fidell, 2013). Therefore, the deviation in large samples does not depart from the normal considerably. Positive kurtosis tends to disappear in a sample size larger than 100 and negative kurtosis in a sample size larger than 200 (Tabachnick, & Fidell, 2013). In the light of this information, the data was assumed to have a normal distribution and a multiple linear regression analysis was used. VIF statistic was investigated in multiple linear regression. The VIF statistic shows a multiple linear dependency/connection between exploration variables. If the VIF value is close to 1, there are no multiple linear dependencies between the predictor variables (Ozdamar, 2013). Also, in this study, there were no multiple linear dependencies at a high level between the predictor variables. Exploratory factor analysis (EFA), reliability analysis and multiple regression analysis were performed with SPSS. CFA was performed with AMOS.

3. RESULTS/FINDINGS

3.1. Process of Developing a Measurement Tool: Effective Teacher Characteristics Inventory

The structure expected to appear from the 80 items in the item pool considered collectively was tested. As a result of the EFA performed using the principle component method, the measurement tool assumed a 21-factor structure. From the dataset analysis values, KMO was found above 0.500 and Bartlett's value significant ($p<.05$). These values are sufficient according to Field (2018), Kalayci (2005) and Ozdamar (2013). In an effort to reduce the number of factors and find a simpler solution, the scree plot of the factor analysis was examined and it was decided to repeat the factor analysis with three distinct factors where the slope was steepest. As a result of the factor analysis performed by limiting the number of factors to three, 27 items were removed from the scale and a 53-item structure was obtained. However, this structure could not be verified by CFA. Therefore, expert views were obtained from a professor and an associate professor from the Department of Educational Assessment and another associate professor from the Department of Curriculum & Instruction. The experts reviewed the results of the factor analysis. They suggested that the measurement tool was more of an inventory type and each dimension should be considered as a separate measurement tool in line with the groupings of effective teacher characteristics in the literature and made subject to a factor analysis individually. The factor analyses carried out in line with these suggestions revealed that the inventory had four different scales independent of each other. A confirmatory factor analysis showed that these scales had covariances with each other and failed to confirm a scale structure. Thus, the scales remained independent. When there are scales independent of each other in a measurement tool, such measurement tool is referred to as an inventory. Aiken (1997, p. 201) has reported that inventories are designed to measure certain variables through the subsets of the items and a score is obtained from the responses given to a certain subset of the items of an inventory. The extraction values obtained for the four independent scales of the inventory from the factor analyses and the item-total correlations obtained from the reliability analysis are shown in Table 4.

Table 4. *Subscale extraction values and item-total correlations of the effective teacher characteristics inventory*

	Items	Extraction Value	Item-Total Correlation
Scale of Competency of Subject Matter Knowledge	I1: When necessary, I give details of the information on the subject in my class.	0.756	0.723
	I2: I respond to student questions requiring additional information (elaboration/detailing).	0.781	0.753
	I3: I direct my students to sources from which they can obtain additional information on the subject.	0.683	0.665
	I5: I utilize diverse examples related to the subject.	0.420	0.466
Scale of Teaching Skills	I8: I use various assessment methods and techniques.	0.465	0.480
	I11: I use appropriate learning strategies (repetition, review, concept maps, etc.).	0.541	0.714
	I12: I use appropriate teaching strategies (via invention, presentation, etc.).	0.720	0.549
	I13: I apply teaching principles (from concrete to abstract, establishing links with life, from near to distant, from easy to difficult, etc.) in my class.	0.644	0.626
	I15: I take into consideration individual differences of students.	0.650	0.560
	I16: I repeat subjects not understood.	0.673	0.560
	I27: I use reinforcers in appropriate variety and frequency.	0.557	0.561
	I31: I motivate my students.	0.630	0.680
	I32: I use classroom management approaches.	0.789	0.543
	I33: I display democratic behaviour in my class.	0.622	0.732
Scale of Personality Characteristics	I46: I treat fairly in class.	0.510	0.599
	I48: I respect my students.	0.629	0.689
	I52: I display positive attitude towards my students.	0.570	0.645
	I54: I am honest to my students.	0.559	0.642
	I58: I am responsible.	0.571	0.649
	I62: I am open to criticism.	0.447	0.555
	I66: I am sincere (openhearted) to my students.	0.511	0.600
Scale of Professional Development	I70: I appreciate professional development.	0.562	0.551
	I72: I follow novelties.	0.665	0.630
	I73: I follow updates.	0.643	0.608
	I76: I have a tendency to life-long learning.	0.526	0.524

A review of Table 2 shows that the factor analysis item extraction value is above 0.40 and the item-total correlation above 0.450 in the items included in the subscales of the inventory. Factor analysis item extraction and item-total correlation values are at the desired level according to the literature (Cokluk, Sekercioglu & Buyukozturk, 2010; Tabachnick & Fidell, 2013). From the four different scales, only the "Scale of Teaching Skills" has three subfactors within itself. These are monitoring and assessment skills, teaching skills and classroom management skills of the teacher.

Four items in the scale of competency of subject matter knowledge were found to explain 66% of the characteristic in question, the scale of teaching skills 63% of the characteristic in question (the remaining items in three-factor structure), the scale of personality characteristics 54% of the characteristic in question, and the scale of professional development 60% of the

characteristic in question. The Cronbach Alpha reliability coefficient was found to be 0.82 for the scale of competency of subject matter knowledge, 0.74, 0.72 and 0.74 for the three factors in the scale of teaching skills, 0.86 for the scale of personality characteristics, and 0.77 for the scale of professional development. The CFA results are shown in Figure 1.
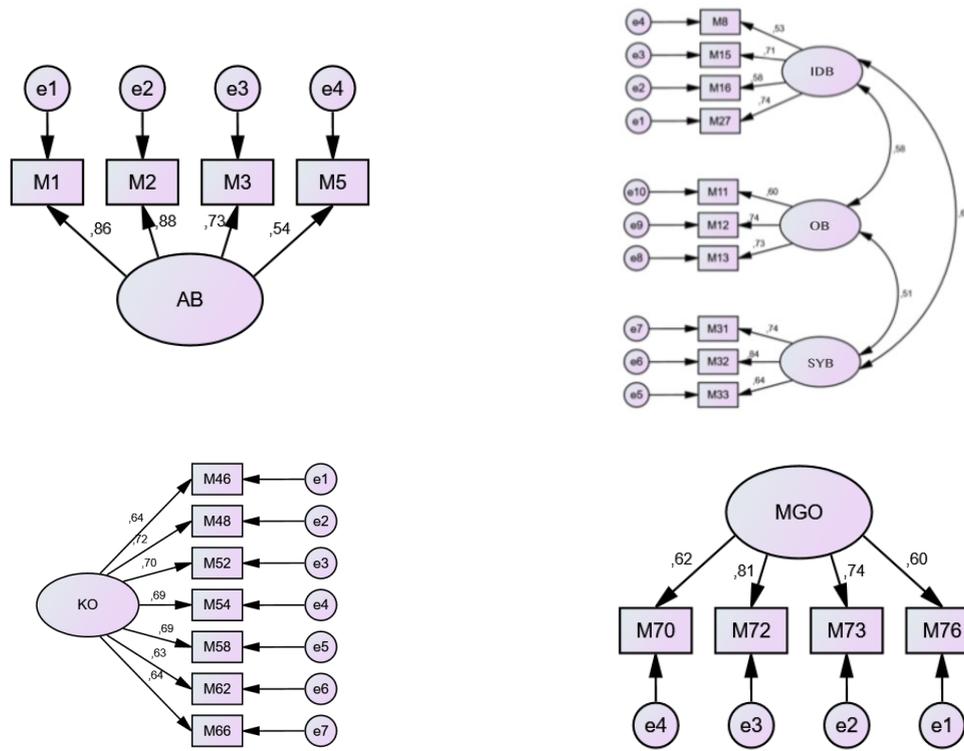

Figure 1. *CFA results of effective teacher characteristics inventory subscales (standardized values) AB: Scale of Competency of Subject Matter Knowledge, IDB: Assessment Skills, OB: Teaching Skills, SYB: Classroom Management Skills, KO: Scale of Personality Characteristics, MGO: Scale of Professional Development*

The fit indices obtained from CFA diagrams are shown in Table 5.

Table 5. *Fit indices*

Scale	RMSEA	RMR	GFI	AGFI	NFI	IFI	CFI	X^2/sd
Scale of Competency of Subject Matter Knowledge	0.078	0.015	0.993	0.963	0.960	0.970	0.969	1.905
Scale of Teaching Skills	0.071	0,030	0,942	0,900	0,896	0.919	0.918	2.794
Scale of Personality Characteristics	0.069	0.032	0.952	0.905	0.931	0.944	0,944	2.786
Scale of Professional Development	0.074	0.013	0.992	0.960	0.986	0.990	0.990	2.146

Table 3 shows that the fit indices are within excellent and acceptable ranges according to the literature on scale development and the reference values given in Table 1. In the light of these results it can be said that within the limitation of the study groups from which the data were obtained the "Effective Teacher Characteristics Inventory" is capable of making valid and reliable measurements for effective teacher characteristics under four independent scales.

3.2. Variables Predicting Teaching Skills of Teachers

Among the basic skills expected of teachers as professionals, teaching skills have an important role. For this reason, the effects of subject matter knowledge, personality characteristics, professional development, and reasons for choosing the teaching profession on teaching skills were dealt with in this section of the study. To this end, a multiple linear regression analysis was performed. The regression formula tested in the analysis is given below.

$$\hat{Y}_{Teaching\ Skills} = b_0 + b_{Subject\ Matter\ Knowledge}X_{Subject\ Matter\ Knowledge}$$
$$+ b_{Personality\ Characteristics}X_{Personality\ Characteristics}$$
$$+ b_{Professional\ Development}X_{Professional\ Development}$$
$$+ b_{Altruist\ Reasons\ to\ Choose}X_{Altruist\ Reason\ to\ Choose}$$
$$+ b_{External\ Reasons\ to\ Choose}X_{External\ Reasons\ to\ Choose}$$
$$+ b_{Reasons\ for\ Being\ Affected}X_{Reasons\ for\ Being\ Affected}$$

The above formula was tested with a multiple regression analysis. Each regression is a model. Therefore, in regression analyses, first a summary and fit of the regression model needs to be shown. A summary of the multiple linear regression model used is shown in Table 6.

Table 6. *Model summary*

R	R^2	Adjusted R^2	Standart Error
0.670	0.449	0.438	3.83

The R^2 value in Table 4 gives information about the exploration rate of the model. Assuming that they affect teaching skills in this model, subject matter knowledge, personality characteristics, professional development, and reasons for choosing the teaching profession as a career (altruistic/intrinsic reasons, extrinsic reasons, influence of others) were included in the model as predictor variables. The predictor variables were found to explain 45% of the variance (R^2=0.449) in teaching skills. The fit values of the model are given in Table 7.

Table 7. *Model fit*

Model	Sum of Square	df	Mean Square	F	p
Regression	3750.763	6	625.127		
Residual	4608.047	314	14.675	42.597	0.000
Total	8358.810	320			

The result of an ANOVA test on the fit values of the model in Table 5 was found to show model fit ($F_{(6-314)}$=42.597; $p<.05$). After establishing model exploration rate and model fit, the regression coefficients and prediction levels of the predictor variables were studied. The results are shown in Table 8.

Table 8. *Effect of subject matter knowledge, personality characteristics, professional development, and reasons for choosing the teaching profession as a career on teaching skills of teachers*

Model	B	Std. Error	t	p	VIF
Constant	13.613	2.023	6.730	0.000	
Subject Matter Knowledge	0.552	0.097	5.711	0.000	1.281
Personality Characteristics	0.284	0.061	4.656	0.000	1.484
Professional Development	0.427	0.086	4.946	0.000	1.540
Altruistic/Intrinsic Reasons	0.066	0.044	1.495	0.136	1.625
Extrinsic Reasons	-0.017	0.039	-0.426	0.670	1.614
Influence of Others	0.110	0.061	1.796	0.073	1.500

A review of Table 6 reveals that the constant was significant. This can be interpreted that some variables not included in the model besides the predictor variables (subject matter knowledge, personality characteristics, etc.) that have been included are also predictors of teaching skills of teachers. From the predictor variables in the model, subject matter knowledge, personality characteristics and professional development are positive predictors of teaching skills of teachers ($p<.05$). As teachers improve their subject matter knowledge, personality characteristics and professional development, their teaching skills also improve. However, reasons for choosing the profession is not a significant predictor of teaching skills of teachers ($p>.05$).

4. DISCUSSION and CONCLUSION

Given the limitations of the study groups from which data were obtained, the results of the analyses made in the study have shown that the "*Effective Teacher Characteristics Inventory*" is able to make valid and reliable measurements for effective teacher characteristics under four independent subscales (subject matter knowledge, personality characteristics, professional development, and teaching skills). From the predictor variables in the multiple regression analysis model, subject matter knowledge, personality characteristics and professional development are significant positive predictors of teaching skills of teachers ($p<.05$). As teachers improve their subject matter knowledge, personality characteristics and professional development, their teaching skills also improve. However, reasons for choosing the profession is not a significant predictor of teaching skills of teachers ($p>.05$). The results of this study have shown that reasons for choosing the profession is not a significant predictor of teaching skills of teachers. Looking at the literature, some similar studies can be seen. For example, Rots, Aelterman, Devos, & Vlerick (2010) have tested their hypothetical teacher education model on a group of students (n=436) and a group of newly graduated teachers (n=251). In their study, the data were collected using the "Teachers' Sense of Efficacy Scale" developed by Tschannen Moran & Woolfolk Hoy (2001), which included content knowledge, subject matter knowledge, efficacy in classroom management and efficacy in student engagement. The results of their study demonstrated that all values measured by the scale were moderately correlated with the other components included in the model and affected the decision whether to actually perform the teaching profession. Their results point out findings that are different from the results of the present study. This may have been influenced by the specific objective, method, context and timing of the study and other reasons. Tschannen Moran & Woolfolk Hoy (2007) conducted another study on the efficacy of teachers including their teaching skills with teachers who were in their first year of the profession and those who were experienced. The study results have shown that teachers need increasingly more support in the process of their experience in the profession to be able to feel more competent in teaching skills.

In a study of Levine (2017), close to a thousand teacher candidates were asked to list the "characteristics they thought mathematics teachers working at primary education level should have". The list prepared from the opinions of teacher candidates revealed that "patience and content knowledge in mathematics" was one of the top items. Levine interpreted this result that teacher candidates had the thought that they should have content knowledge -competence in subject matter knowledge- for effective teaching when they were still students. Supporting this finding, the results of many studies in the literature (Blömeke, Busse, Kaiser, König & Suhl, 2016; Brewer & Goldhaber, 2000; Kamamia, Ngugi & Thinguri, 2014; Monk, 1994; Monk & King, 1994; Rowan, Chiang & Miller, 1997) show that the competency of teachers and teacher candidates in -subject matter knowledge- has a positive effect on their academic achievement.

The results of another study made by Richorson & Watt (2006) with teacher candidates studying in faculties of education of three large state universities in Australia revealed that "beliefs in teaching skills, value of teaching profession with respect to personal and social benefit and

previous learning and teaching experiences" were primarily effective in their choice of the teaching profession.

Their result suggesting that competence in subject matter knowledge, personality characteristics and professional development support teachers' teaching skills seems similar to those found in the literature. The finding in the present study that reasons for choosing the teaching profession was not a significant predictor of teaching skills was not compatible with the literature. In this respect, further studies in Turkey may choose to deal with the relationship between reasons for selecting the teaching profession and effective teacher characteristics. The results of this study can be summarized as follows: A measurement tool called "Effective Teacher Characteristics Inventory" was developed for secondary school level during the study. This tool was in the form of an inventory consisting of four scales independent of each other, namely "competency in subject matter knowledge", "teaching skills", "personality characteristics" and "professional development". The total scores obtained from each independent scale cannot be summed up to obtain an overall total score. Nevertheless, given the present structure of the inventory and the data obtained from this study, it can be considered as a valid and reliable measurement tool.

Another result obtained from this study was that improved subject matter knowledge, personality characteristics and professional development of the teachers also improved their teaching skills. However, reasons for choosing the profession had no impact on teaching skills of the teachers.

Further studies on different samples repeating the validity and reliability testing of the inventory and new validity and reliability evidences to be obtained will further strengthen the technical aspects of the inventory. Additionally, the inventory can be experimented at different levels (primary education, secondary education, higher education) and new validity and reliability evidences can be obtained.

The results of this study have shown that from the effective teacher characteristics, subject matter knowledge, teaching skills, personality characteristics, and professional development were associated with themselves. This result can be taken into consideration in teacher education programs and can contribute significantly to teacher candidates in their effort to get prepared for the profession.

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).

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