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Attitudes of High School Teachers to Educational Research Using Classification-Tree Method*

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A R T I C L E I N F O	A B S T R A C T
	Purpose: The main objective is to investigate high school teachers' attitudes relating to educational research with respect to demographic variables. **Research Methods:** The study is based on the relational screening model. Data was obtained through an adapted scale to determine high school teachers' attitudes toward educational research. The study was carried out with 669 teachers working at 11 different branches in metropolitan areas, towns, and counties. The data obtained in this study was analysed by SPSS

(Statistical Package for Social Sciences) for Windows 21.0 program. **Findings:** It was observed that teachers with 1-5 years' occupational seniority showed more sensitivity towards educational research than those who had been working for more than five years. Their tendency to "[follow] scientific journals relating to their study field" was also found to be significant. Additionally, among teachers following scientific journals relating to their field, female teachers showed a greater interest in educational research than male teachers. **Implications for Research and Practice**: Based on these results, in-service training activities should be organised and given to high school teachers who have completed five years in the teaching profession at state schools and in relevant university departments in order to improve the attitudes of teachers towards educational research and encourage teachers to follow publications related to their field.

Introduction

Scientific research is an information production activity that identifies a problem, plans and implements solutions, draws conclusions, discusses results, and evaluates findings. In this regard, it is necessary that teachers should be willing and capable of carrying out scientific research in the field of education. In this process, teachers may use information and communication technologies, analyse data, and share results with management and other educators. Teachers are responsible for educating students in research skills, problem solving, and critical thinking need to possess these skills. They must also display a positive attitude towards scientific research. Kucukoglu, Tasgin and Celik (2013) determined that concepts related to the research process were not completely understood by teacher candidates who did not think teachers needed to do research; however, they did consider that scientific research may serve them well in their working lives. Kilic and Acat (2007) stated that teacher candidates need to carry out research or contribute to those who apply scientific methods while solving their problems. Korkmaz, Sahin and Yesil (2011a) emphasised that teachers need to keep up with new developments, which requires possessing study skills, contributing to others' studies, and displaying a positive attitude towards research and researchers. In this sense, teachers should create an effective learning environment and use methods and techniques that provide learning opportunities for every student (Kilic, 2006). Educational surveys are important for the career development of teachers (Counsell, Evans, McIntyre & Raffan, 2000). These involve conceptualising, observing, and recording systematically, analysing observed data, and publishing the acquired data (Mortimore, 2000). It is important to know how to utilise meaningful educational surveys and how to obtain current studies (Everton, Galton & Pell, 2000; Ekiz, 2006). If teachers lack study skills and do not examine studies conducted in their field, it is difficult to breed a research culture among their students (Sari, 2006). It is desirable for teachers to utilise educational surveys effectively and to implement various kinds of surveys as an action researcher (Isman, Altinay-Aksal & Altinay-Gazi, 2009; Rossouw, 2009; Sahin & Arcagok, 2013). The most important characteristic of efficient teachers is being up-to-date regarding innovations in their field (Sahin, 2011). Teachers should voluntarily attend educational activities, enabling themselves to be informed about new developments in education (Ucgun & Unal, 2015). The same applies to teacher candidates (Kucukoglu, Tasgin & Celik, 2013). Through these activities, teachers both renew themselves in the working sense and are more beneficial to their students (Genc, 2006). To be teachers today and in the future, they need to produce and consume information actively (Sari, 2006). Efficient teachers should be aware of their own inabilities and perceive development as an obligatory process through which they adopt the philosophy of lifelong learning and development (Can, 2004). However, the literature indicates that teachers do not show much interest in educational research (Sari, 2006). Furthermore, educational research makes very few practical contributions towards solving the problems faced by teachers, administrators, and politicians due to their negative attitude teachers express towards educational research (Everton Galton & Pell, 2002; Hemsley-Brown & Sharp, 2003; McMillan & Schumacher, 2006; Biesta, 2007), whether in the form of journal papers, conference presentations, reports, online sources, or theses. It is extremely important for teachers

to be aware of educational research and benefit from it, as well (Yildirim, Ilhan, Sekerci & Sozbilir, 2013). It has been determined that, by following practical activities, candidate teachers are able to build a bridge between theoretical data and acquisition relating to application (Walter & Han, 2012). Attitudes towards scientific research, in general (Cousins & Walker, 2000; Papanastasiou, 2005; Walker, 2010; Kucukoglu, Tasgin & Celik, 2013; Ates & Yildirim, 2015), or educational research, in particular (Everton, Galton & Pell, 2002; Yavuz, 2009; Ozturk, 2010; Yildirim, et al., 2013; Ucgun & Unal, 2015), have been investigated in studies of candidate teachers, teachers, and educationalists. In a study to determine the use of research results by teachers to address problems and their awareness level of studies concerning school education, Ahduja (2012) found that teachers do not use research findings, have a low awareness level about studies conducted, do not understand the terminology used in research, and have difficulty obtaining published research. There are numerous studies in the literature on educational research and its practical usage. Ekiz (2006) mentioned that the gap between academic culture and application culture arises from teachers' perceptions. Both Hemsley-Brown and Sharp (2003) and Vanderlinde and van Braak (2010) considered it important to find channels of cooperation between researchers and implementers, which would allow them to remain informed about research results. Broekkamp and van Hout-Wolters (2007) proposed that teachers possessing postgraduate education or being informed about scientific research and results via in-service training would be a crucial contribution, and that teachers and researchers should execute research by working together. Ates and Yildirim (2015) found an important gap between research and implementation, exemplified by teachers being unaware of how and where to find scientific research and not being included in the decision-making process, lack of trust by teachers in research and researchers, teachers' negative beliefs in the generalisability of research, and research not reflecting classroom reality. Ekiz and Yigit (2012) reported that teachers merely apply research results when deciding educational implementations due to the communication gap between academics and teachers. According to Joram (2007), teachers believe that educational research lacks reliability because it is prepared within a technical framework. According to findings from interview data relating to teachers' pursuit of educational research, Yildirim et al. (2013) stated that, although some teachers regularly or intermittently follow up educational research, the vast majority have no interest in it. Ekiz and Yigit (2012) found that teachers conveyed "negative or indecisive" opinions on the purpose of educational research and by whom it should be implemented. In addition, teachers' attitudes towards research are important concerning whether they benefit from the findings. Since attitudes have significant directive effects, either positive or negative behaviours may arise as a result (Tavsancil, 2006, p. 72).

The main objective of the present study is to investigate the attitudes of high school teachers relating to educational research with respect to demographic variables, and to determine difference variations in their attitudes according to these demographic variables.

Method

Research Design

As numerous factors affect the attitudes of teachers towards educational research, the relational screening model was chosen as the most appropriate. This model screens the entire population or a sample to construct a general judgment about the population, consisting of many elements (Karasar, 2007). The aim, metaphorically speaking, is to describe a situation related to the research subject by taking photos of it (Buyukozturk, Cakmak, Akgun, Karadeniz & Demirel, 2012).

Research Sample

The research group included 699 high school teachers working in various departments and different schools in Istanbul (metropolis), Ardahan, and Kars. Demographic variables of the teachers are presented in Table 1.

Table 1.

Demographic Variables of High School Teachers in Study

		F	%
Gender	Male	298	44.5
	Female	371	55.5
Educational Status	Bachelor's Degree	607	90.7
	MSc (Master of Science) degree	62	9.3
	1-5	415	62
	6-10	138	20.6
Professional Seniority (years)	11-16	65	9.7
	17 or more	51	7.6
	County	90	13.5
Place of Duty	City	367	54.9
	Metropolis	212	31.7
Total		669	

As seen in Table 1, 298 (44.5%) of the teachers were male and 371 (55.5%) female. A total of 607 (90.7%) teachers had a bachelor's degree and 62 (9.3%) a master degree. According to their professional seniority, 415 (62%) teachers had served for under 5

years, 138 (20.6%) had 6-10 years of seniority, 65 (9.7%) had 11-16 years of seniority, and 51 (7.6%) had 17 or more years of professional experience. Regarding the distribution of teachers according to where they work, 90 (13.5%) teachers worked in counties (townships), 367 (54.9%) were located in cities, and 212 (31.7%) worked in the metropolis of Istanbul.

Research Instruments and Procedures

The scale developed by Ilhan et al. (2013) to determine the attitudes of teachers towards educational research was used in this study. The scale, developed for application on primary and high school teachers, consists of three factors and 20 items. A minimum of 20 points can be taken from the scale and the maximum score is 100%. In the process of scoring the scale, the (n-1) / n formula was applied. The falling score was calculated as 0.80 at all levels so all intervals would be equal for all levels. Therefore, the values were determined as 1.00-1.80 "strongly disagree", 1.81-2.60 "disagree", 2.61-3.40 "undecided", 3.41-4.20 "agree", and 4.21-5.00 "strongly agree".

The scale in the 5-point Likert format scored the first and second factors as follows: "Completely Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1)". The third factor of the scale should be in reverse order, according to the scoring of "Totally Agree (1), Agree (2), Undecided (3), Disagree (4), Strongly Disagree (5)". When the factors in the scale are scored, all statements in the first and the second factors need to be coded evenly because all of them are positive. The statements in the third factor should be encoded in reverse because they consist of negative statements. A high score from the first factor of the scale shows that teachers have positive attitudes towards the necessity of educational research, while a high score from the second factor shows positive attitudes towards valuing educational research. A high score in the third factor can be interpreted that teachers' attitudes on the applicability of educational research are positive.

The Bartlett's test value for the 20-item scale was 3684.944 (190, p< .001) and its KMO value was 0.890. The total variance of the scale (three factors and 20 items) was 50.642%. The first factor formed 17.988%, the second factor 16.746%, and the third factor formed 15.907% of the total variance. When the load factor values of the 20 items were studied, it was seen that they were between 0.551 and 0.839. Cronbach's Alpha reliability coefficients of the final version of the scale were 0.841 for the first factor, 0.816 for the second factor, and 0.781 for the third factor; the whole scale was calculated as 0.816. The first level of the scale's confirmatory factor analysis results is as follows: Chi-Square (164, N = 504) = 432, 65 = 2.64, RMSEA = 0.057, RMR = 0.044, SRMR = 0.055, GFI = 0.92, AGFI = 0.90, NFI= 0.95, CFI = 0.97. It was, thus, determined that the scale showed a good fit.

Data Analysis

In this part of the research, we checked the distribution of the data obtained before starting the analysis. Since the sample group size was greater than 50, the distribution was checked with the Kolmogorov Smirnow Test (rather than the Shapiro Wilk Test, used for groups smaller than 50) (Koklu, Buyukozturk &

Bokeoglu, 2006), and a normal distribution of p was obtained. If the p-value is (p< .05), the data do not show a normal distribution.

As the individuals in the sample may belong to a heterogeneous structure and may come from different populations with regard to scores received from the measurement tool, the dependent variable was subjected to two-step cluster analysis. Two-step cluster analysis is a multivariate statistical method that can analyse continuous and categorical data together (Everit, 1994). Two-step cluster analysis aims to separate the data set into homogeneous subgroups. Statistics obtained after the heterogeneous data set is divided into homogeneous sub-classes or clusters provide healthier results (Kayri, 2007). Two-step cluster analysis can be used on large data sets, especially in research in educational sciences employing a Likert-type questionnaire (Celik, Satici & Celik, 2005; Kayri, 2007). If the variables in the data set are of the same data type, the phase sequential (hierarchical) clustering method is used, while in the case of no prior knowledge about the number of clusters, the non-phase sequential (hierarchical; K-mean) clustering method is used. Where there is a lack of prior knowledge about the number of clusters, two-step cluster analyses should be preferred (Ozdamar, 2002). The total score from the scale was classified as low-medium-high through two-step cluster analysis, and the dependent variable was converted to a categorical variable.

As the dependent variable was a discrete variable, the SRA Classification-Tree Method was used, which offers a structure that affects predictor variables. Visually presenting the results makes this technique superior to other regression techniques (Kayri & Boysan, 2008). Representation of the interaction model in the form of a diagram (sub-trees; node), which provides the expansion of significant relations between independent and dependent variables through the SRA method, is an advantage of this technique (Hébert, Delphine Collin-Vézina, Daigneault, Nathalie Parent & Tremblay, 2006). Additionally, because many parametric methods such as multiple regression analysis accept the data set as a whole as homogeneous, the generalisability and reliability of the parameters estimated by these methods are debatable (Chen & Kou, 2001; Okut, Duncan, Susan & Strycker, 2002).

The recommended method is dividing the universe into homogeneous sub-groups and interpreting each homogeneous sub-class in itself (Kayri & Gokdas, 2006). Outcomes subjected to cluster analysis of data sets consist of three stages: a) cluster distribution table, b) cluster profile table, and (c) frequency table. The frequency distribution table consists of the number of frequencies (n) belonging to each obtained cluster and their percentages. The table of the cluster profile shows the mean values of continuous variables and their standard deviation values. The frequency table includes ratios containing only categorical variable frequencies and percentage values. Through these, the researcher can arrive at detailed information for each generated cluster. Furthermore, as in other classification techniques, the category where each variable in the data set belongs can be calculated. Statistical package programs offer this facility to researchers (Kayri, 2007).

In this study, the cluster analysis technique, which educators can apply to a non-homogeneous data set, was used. As the number of clusters for the universe was unknown, teachers' attitudes toward educational research were examined using the two-step cluster analysis technique, which automatically detects the number of clusters.

Adaptation of the Scale

Before adaption, the original scale (Ilhan et al., 2013) was applied to 270 high school teachers working in different fields. First, exploratory factor analysis was applied to the data obtained. Then, first-level confirmatory factor analysis was applied to data obtained from the exploratory factor analysis results. Following this, the suitability of the model was tested by applying second-level confirmatory factor analysis. Thus, an adaptation of the "Teachers attitude scale towards educational research" to high school teachers was achieved. The findings of the adapted scale are presented below.

Exploratory Factor Analysis (EFA)

Factor analysis is the most powerful method to measure construct validity. It enables measurements to be conducted using far fewer factors by bringing variables measuring similar properties together (Tabachnick & Fidell, 2001). First, Exploratory Factor Analysis (EFA) was performed on the data to test the construct validity of the scale. Then, the Kaiser-Meyer-Olkin (KMO) Sample Competency Test and the Bartlett Globosity Test were applied for the same purpose (Table 2).

Table 2.

KMO and Bartlett Globosity Test Findings

KMO Sample Competency Test		0.881
Bartlett Globosity Test	χ^2	2332.919
	Sd	190
	Sig.	.000

The data were analysed by the KMO and the Bartlett Globosity Test for validity of the data structure for factor analysis in terms of sample size. The value of KMO was determined as .881, while the Bartlett test value was found to be χ^2=2332.919 and the sd=190 (p=.000). Since a KMO value greater than or equal to 0.60 is considered sufficient to perform factor analysis (Buyukozturk, 2010), it was considered suitable for our 20-item scale. At this stage of the research, the scale consisted of 20 items and three factors. It was determined that the scale items were able to explain 54.02% of the total variance. The item-total correlation of this three-factor scale varied between .455 and .829, and Cronbach's alpha reliability coefficient of the scale was found to be .88.

Considering the items in the three-factor scale, and the factor load range of these items in addition to the reliability coefficients of these factors, it was determined that the first factor varied between 0.603 and 0.720, while its reliability coefficient was found to be .83. The second factor varied between 0.508 and 0.829, and its reliability coefficient was .85. The third factor ranged between 0.455 and 0.768, and its reliability coefficient was .81. The correlation values between factors in the resulting three-factor scale are presented in Table 3.

Table 3.

Analysis Results of Correlation Coefficient between Factors on Original Scale

	F1	F2	F3
F1	1		
F2	666**	1	
F3	389**	441**	1

**p< .001

Considering the correlation values between factors on the three-factor scale using Pearson correlation coefficient (r), a high positive correlation was found between F1 with F2, while weak positive correlations were found between F1 with F3, and F2 with F3, respectively. According to Pearson correlation coefficient, there is a "very weak" correlation between factors if the value of (r) is between 0.00-0.25, "weak" if between 0.26-0.49, "moderate" if between 0.50-0.69, "high" if between 0.70-0.89, and a "very high" correlation between factors if the value of (r) is between 0.90-1.00 (Kalayci, 2005). Low correlation between factors shows that the factors are independent of each other, which supports the factor structure.

The factor loads of the 20 items in the three-factor scale, eigenvalues, and extent to which they explain the variance related to their reliabilities are presented in Table 4.

Table 4

Factor Analysis Results of 20-İtem Three-Factor Adapted Scale

Factors	Item	Items	F1	F2	F3
(Factor 1) (Necessity of Educational Research	I3	Educational research contributes to the improvement of education programs.	.720		
	I1	Educational research provides me with useful data I can use in courses.	.707		
	I5	Educational research finds solutions to problems I encounter.	.707		
	I4	Educational research is important for me in choosing teaching models, methods, and techniques.	.664		
	I2	I like seminars about educational research.	.624		
	I6	Research findings on training given in seminars are useful.	.623		
	I7	I enjoy giving lessons through educational research findings.	.603		
(Factor 2) (Valuing Educational	I11	It is necessary do scientific research about education.		.829	
	I12	Educational research contributes to developing teaching methods.		.757	
	I9	It is important to be informed about educational research.		.693	

Table 4 continued

Factors	Item	Items	F1	F2	F3
	I10	It is important to receive the benefits of educational research in order to be a qualified teacher.		.658	
	I8	Teachers should benefit from educational research findings.		.510	
	I13	Scientific papers about education (theses, articles, books, etc.) help to increase the level of education.		.508	
(Factor 3) (Applicability of Educational Research)	I16	I think scientific papers about education (theses, articles, books, etc.) are shallow.			.768
	I17	Educational research is not applicable in the school environment.			.735
	I19	I don't think educational research is applicable.			.700
	I18	It is a waste of time trying to give lessons through the results of educational research.			.689
	I15	Educational studies by academics are only done to help them progress their career.			.663
	I20	Giving lessons according to educational research findings decreases student success.			.585
	I14	I cannot finish the topic of the lesson on time when I follow the data of educational research.			.455
		Value:	*3.912*	*3.481*	*3.413*
		Explained Variant:	*19.558*	*17.404*	*17.064*
		Factors Cronbach Alpha:	*.834*	*.852*	*.811*
		Scale Cronbach Alpha:	*.887*		

Table 4 shows results of EFA performed on the final three-factor version of the scale. The factor of "Necessity of Educational Research" consisted of seven items; its item-total correlation value varied between 0.603 and 0.720, and its reliability coefficient was .83. The eigenvalue of this factor was 3.912, and its contribution to general variance was 19.55%. The second factor, "Valuing Educational Research", consisted of six items; its item-total correlation value varied between 0.508 and 0.829, while its reliability coefficient was .85. The eigenvalue of this factor was 3.481, and its contribution to the general variance was 17.40%. The third factor, "Applicability of Educational Research", consisted of seven items. Its item-total correlation value varied between 0.455 and 0.768, and its reliability coefficient was .81. The eigenvalue for this factor was 3.413, and its contribution to the general variance was 17.06%. Considering the whole scale, factors were found to explain 54.02% of the variance.

First- and Second-Level Confirmatory Factor Analysis (CFA)

Although Confirmatory Factor Analysis (CFA) is often used for the development of scales and validation analyses, it can also be used to determine the accuracy of a predetermined structure (Bayram, 2010). CFA is frequently used for the development of measurement models and provides significant convenience. It is a process used for forming a latent variable by using the variables observed through a previously-developed model (Jin, Tang, Ma, Lv, Bai & Zhang, 2009). In addition, the model developed can be theoretically determined by the researcher via CFA or can be a model obtained as a result of EFA (Aytac & Ongen, 2012).

As a result of EFA, the data obtained from the 270 students in the sample group using first- and second-level CFA was used to verify the three-factor structure of the adapted scale. There is no consensus on the number of samples needed for CFA (Waltz, Strickland & Lenz, 2010), but it should be 10 times more than the number of items and no fewer than 200 (Kline, 2005). In first- and second-level CFA applied on the data obtained by EFA, several fit indexes, such as the Chi-Square Fit Test (χ^2/sd), Goodness-of-Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Test (CFT), Normalised Fit Test (NFT), Non-Normalised Fit Test (NNFT) and Root Mean Square Error of Approximation (RMSEA), were used (Sanders, Allen, Forman, Tarpey, Keshavan & Goldstein, 2005).

First-Level Confirmatory Factor Analysis

Firstly, three suppressive variants were determined by the original scale (Necessity of Educational Research, Value Given to Educational Research, and Applicability of Educational Research) and primary CFA for the model, consisting of 20 observable variables. Goodness-of-fit values of CFA and ranges of the fitness criteria are presented in Table 5.

Table 5.

Fitness Criteria of Confirmatory Factor Analysis

Fit Indices	Perfect Fit	Acceptable Fit	Model
χ^2/df	$0 \leq \chi^2/df \leq 2$	$2 \leq \chi^2/df \leq 3$	1.950
RMSEA	$0 \leq$ RMSEA ≤ 0.05	$0.05 \leq$ RMSEA ≤ 0.08	0.059
S-RMR	$0 \leq$ S-RMR ≤ 0.05	$0.05 \leq$ S-RMR ≤ 0.10	0.054
IFI	$0.95 \leq$ IFI ≤ 1.00	$0.90 \leq$ IFI ≤ 0.95	0.97
NNFI	$0.97 \leq$ NNFI ≤ 1.00	$0.95 \leq$ NNFI ≤ 0.97	0.97
NFI	$0.97 \leq$ NNFI ≤ 1.00	$0.95 <$ NNFI < 0.97	0.95
CFI	$0.97 \leq$ CFI ≤ 1.00	$0.95 \leq$ CFI ≤ 0.97	0.97
GFI	$0.95 \leq$ GFI ≤ 1.00	$0.90 \leq$ GFI ≤ 0.95	0.90
AGFI	$0.90 \leq$ AGFI ≤ 1.00	$0.85 \leq$ AGFI ≤ 0.90	0.86

As seen in Table 5, first-level CFA goodness of fit values were found as [$\chi^2(sd, N)$=422.33; 167, 270), χ^2/sd=2.528, *RMSEA*=0.075, *S-RMR*=0.061, *GFI*=0.87, *AGFI*=0.83, NFI=0.92, NNFI=0.94, IFI=0.95 and CFI=0.95. At the end of primary CFA, analysis of

the modification index and necessary modifications were performed on "item 12 and item 11", "item 15 and item 16", and "item 20 and item 18". The new values obtained from this analysis were [χ^2(sd, N)=(319.87; 164, 270), RMSEA=0.059, S-RMR=0.054, GFI=0.90, AGFI=0.86, CFI=0.97, IFI=0.97, NNFI=0.97, NFI=0.95]. According to this, the proportion of the chi-squared level to the degree of freedom is (χ^2/df); IFI, NNFI, and the CFI value show a perfect match. Furthermore, RMSEA, S-RMR, NNFI, NFI, GFI, and AGFI scores show acceptable consistence (Schermelleh-Engeland & Moosbrugger, 2003; Sumer, 2000). The most widely-used statistical methods for these values are as follows: Chi-square, GFI, CFI, and RMSEA (Joreskog & Sorbom, 1993). According to the data obtained, there is an acceptable fit of the model. In other words, this model shows that the factors are verified by the data. After modification, the path diagram of Primary CFA and t-values can be seen in Figure 1.
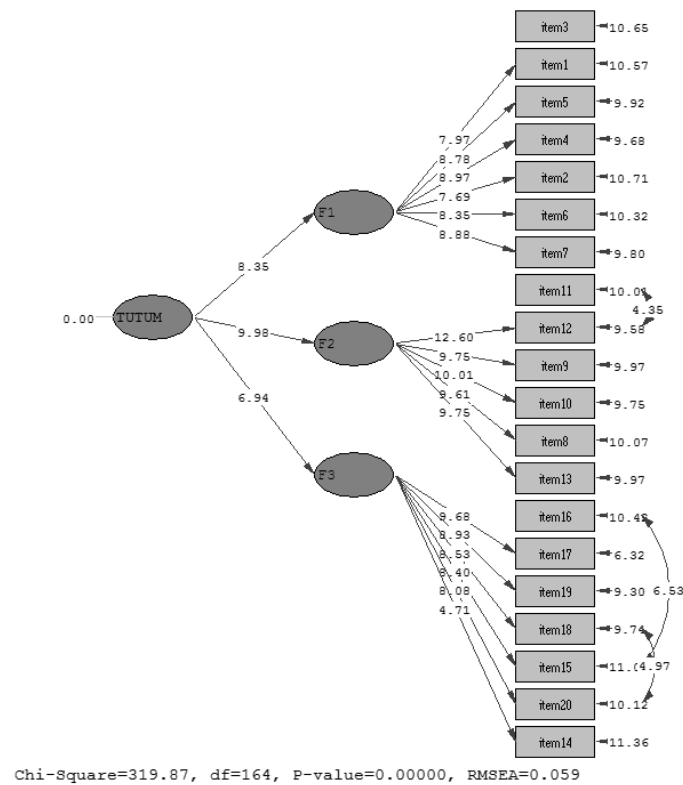

Chi-Square=319.87, df=164, P-value=0.00000, RMSEA=0.059

Figure 2. *Diagram of Second-Level Confirmatory Factor Analysis of Adapted Scale (t-values)*

Note: Tutum: Attitude; F1: Necessity of Educational Research; F2: Valuing Educational Research; F3: Applicability of Educational Research

Factor loads (Lambda x, λx), t-values, and measurement errors (delta δ) between first-level latent variables and second-level lateral variables, and explanation rates (R^2) of the second-level variable on first-level variables are shown in Table 6.

Table 6.

Second-Level Confirmatory Factor Analysis Values of Adapted Scale

Second Level Variables	First Level Variable	Λx	δ coefficient (Measuring Error)	t	R^2
Attitude	Necessity of Educational Research (F1)	0.83	0.31	8.35	0.69
	Valuing Educational Research (F2)	0.89	0.061	9.98	0.93
	Applicability of Educational Research (F3)	0.56	0.60	6.94	0.35

Concerning data given in Table 6, according to the path coefficient (λx) and t-values between the first- and second-level lateral variables, there is a positive and significant correlation between attitude and the first factor ($\lambda x= 0.83$; $p<.05$; $t=8.35$), second factor ($\lambda x= 0.89$; $p<.05$; $t=9.98$), and third factor ($\lambda x= 0.56$; $p<.05$; $t=6,94$). If the t-value is higher than 1.96, it is significant at ($p=.05$); if it is higher than 2.56, then it is significant at ($p=0.001$) (Schumacker & Lomax, 2010). In the model, coefficients related to independent indicator variables predicted by latent independent variables are shown with Lambda x (λx), and error coefficients of independent indicator variables predicted by latent independent variables are shown by Theta-Delta (δ). Lambda x (λx) coefficients also represent the validity coefficients of the scale (Joreskog & Sorbom, 1993).

Since the t-values of all items and all factors in the model are significant, we can conclude that our model is acceptable. Considering the variances explained in the first-level variables in terms of the second-level variable, the highest variability was in the factor "Valuing Educational Research" ($R^2=0.93$), and the lowest variability was in "Applicability of Educational Research" ($R^2=0.35$). Typically, values of (R^2) below 0.2 are considered weak, between 0.2 and 0.4 moderate, and above 0.4 strong (https://www.american.edu/ctrl/,p. 4). The value of the determination coefficient (R^2) should be specified in the research as per the other fit indexes. Explained variance (R^2) is the coefficient that determines to what extent indicator variables explain changes observed in the latent variables (Kelloway, 1998).

Item Discrimination

In this part of the research, item discrimination levels were determined by calculating the correlations between scores obtained from each item in the factors in accordance with the item-total correlation method and scores obtained from factors. Thus, the capacity of each item in the scale in terms of serving the general purpose of the scale was measured. Item-factor correlation values of each item in the scale are given in Table 7.

Table 7.

Correlation Analysis of Item-Factor Scores of Original Scale

F1		F2		F3	
Item No	r	Item No	R	Item No	r
3	.674**	11	.781**	16	.752**
1	.672**	12	.801**	17	.787**
5	.754**	9	.757**	19	.736**
4	.736**	10	.777**	18	.727**
2	.674**	8	.710**	15	.662**
6	.724**	13	.741**	20	.671**
7	.744**			14	.499**

N=270   **p<.001

As seen in Table 7, item correlations varied between 0.674 and 0.754 for the first factor, between 0.710 and 0.801 for the second factor, and between 0.499 and 0.787 for the third factor. Each item in the factors significantly and positively correlated with the entire scale (p<.001). The coefficients obtained are the validity coefficients for each item in the scale, and they indicate the consistency of the scale. In other words, these coefficients show the capacity of factors in terms of serving the general purpose of the scale.

In order to test the reliability of the subscales by means of CFA, the relationship between items in the measurement tool and the total scores from subscales was analysed, and the item-total correlation was calculated in order to measure the internal consistency of the scale, based on the scores of items and subscales. The results are presented in Table 8.

Table 8

Item-Total Correlations and t-values Regarding 27% Difference between Lowest-Highest
Points of Sample Group with Adapted Scale

Item No	Item-Test Correlation	$\overline{X}$	SD
I3	.825**	4.39	.697
I1	.860**	4.38	.743
I5	.772**	3.88	.985
I4	.779**	4.25	.720
I2	.763**	4.05	.924
I6	.756**	3.99	.914
I7	.788**	3.99	.944
Factor 1	.856**	4.131	.668
I11	.790**	4.59	.520
I12	.819**	4.47	.589
I9	.784**	4.44	.598
I10	.811**	4.43	.662
I8	.717**	4.45	.643
I13	.773**	4.22	.783
Factor 2	.862**	4.433	.494
I16	.741**	2.90	1.175
I17	.791**	3.17	1.056
I19	.748**	3.22	1.138
I18	.756**	3.68	.868
I15	.650**	2.83	1.125
I20	.699**	3.92	.895
I14	.566**	2.82	1.176
Factor 3	.793**	3.218	.748
Total	1	3.902	.535

** Correlation found significant both ways at level .001

Regarding Table 8, the correlation for the "attitude" scores of high school teachers toward educational research was found to be 0.856 (p< .001) for the first factor, 0.862 (p<.001) for the second factor, and 0.793 (p< .001) for the third factor. We can, therefore, conclude the internal consistency of the tool and that there is construct validity, since the values of the item test correlation coefficients are not negative, equal, or close to zero (Tavsancil, 2005). Thus, we produced a 20-item, 5-point Likert-type measurement tool that evaluates the attitudes of high school teachers regarding Necessity of Educational Research, Valuing Educational Research, and Applicability of Educational Research. The rating range of the scale is between 20 and 100. While calculating the scores, those of items reflecting Necessity of Educational Research and Valuing Educational Research in the first factor (3, 1, 5, 4, 2, 6, 7) and second factor (11, 12, 9, 10, 8, 13), respectively, were coded normally. A higher total score of the first and second factors on the scale indicates positive attitudes toward educational research. Applicability of Educational Research, the third factor (16, 17, 19, 18, 15, 20, 14) on the scale, was reverse-coded. The higher total score of the third factor also shows positive attitudes by high school teachers.

Results

As the individuals in the sample came from diverse levels of the population, the heterogeneous sample was divided into homogeneous sub-clusters. As a result of clustering analysis, it can be seen that the three different groups, which are heterogeneous between each other and homogeneous on their own, were revealed. In addition, the mean standard deviation values differed for each group. The findings of two-step cluster analysis are presented in Table 9 and the findings of the mean and standard deviation values belonging to the clusters are presented in Table 10.

Table 9

Two-Step Cluster Analysis Frequency Findings of Adapted Scale

		F	*%*
Cluster	1	236	35.3
	2	333	49.8
	3	100	14.9
	Total	669	100

The sub-clusters obtained by two-step cluster analysis (Table 9) show that the number of teachers in the low category is 236 (35.3%), 333 (49.8%) in the medium category, and 100 (14.9%) in the high category. Mean and standard deviation values of the clusters are shown in Table 10.

Table 10.

Two-Step Cluster Analysis Findings

		Total	
		M	*SD*
Cluster	Low	67.88	3.29
	Medium	75.03	2.28
	High	83.18	3.34
	Average	73.73	5.85

The overall average and standard deviation value regarding the attitudes of teachers was calculated as 73.73 ± 5.85. The attitude of the 236 teachers in the first cluster is = 67.88 ± 3.29, which represents the "Low" attitude in the sample. The attitude of 333 (49.8%) teachers in the second cluster is = 75.03 ± 2.28, which represents the "Medium" attitude in the sample. The attitude of 100 (14.9%) teachers in the third cluster is M= 83.18 ± 3.34, which represents the "High" attitude in the sample. The dependent variable was transformed into a categorical variable by classifying the total score obtained via hierarchical clustering analysis of the scale as low-medium-high.

Modeling the Attitude of Teachers towards Educational Research through Classification-Tree Method

As a result of two-step cluster analysis applied to the total score obtained from the scale data, the scale data fell into three clusters (Low, Medium, High). The score obtained via categorical clustering analysis is the dependent variable of the research. The demographic and independant variables of the teachers, such as gender, educational status, occupational seniority, participating in scientific research, following scientific journals, and place of work, are the independent variables. The findings including these dependent and independent variables are presented in Figure 3.
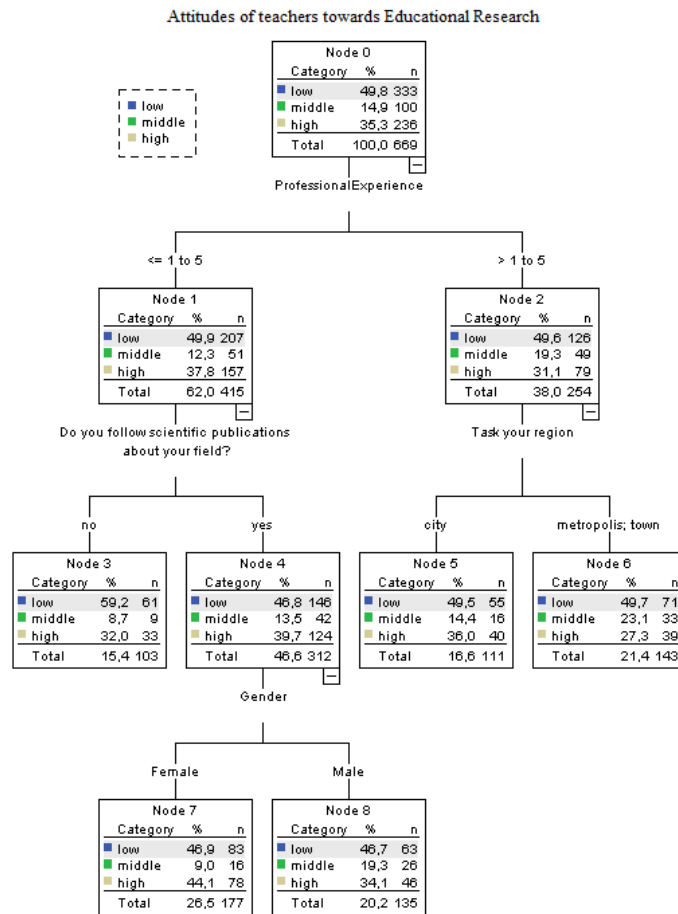

Figure 3. *Classification-Tree Diagram Showing the Effect of Independent Variables on Attitudes of Teachers towards Educational Research*

In Figure 3, the independent variable showing an effect on the level of the attitudes of teachers towards educational research is seen in the tree structure. The professional seniority of teachers is the major variable affecting the dependent variable. The classification-tree puts professional seniority in two different homogeneous points regarding the attitudes of teachers towards educational research. In the tree, the attitude towards educational research of teachers with 1-5 years of professional seniority (37.8%) is more positive than the attitude of teachers with more than 5 years of professional seniority (31.1%). Similarly, there is a connection between teachers who have been working for more than 5 years and their place of duty. There is also an association between teachers with 1-5 years of experience and teachers who follow journals about their profession. The teachers who follow journals (39.7%) have a more positive attitude than those who do not (32%). The teachers who work in cities (36%) have a more positive attitude than those working in counties or a metropolis (27.3%). In addition, an association between teachers who follow occupational journals and gender was determined. Female teachers who read journals (26.5%) had a higher positive attitude than male teachers (20.2%) towards educational research.

Discussion, Conclusion, and Recommendations

In this study, professional seniority is seen as having a major effect on attitudes towards educational research. Attitudes of teachers with 1-5 years of professional seniority is more positive than teachers with more than 5 years of professional seniority. One reason for this may be that teachers who have just started their career have been closely involved with scientific studies during their undergraduate years. In a study of the attitudes of mathematics teachers towards educational research, Bas (2017) found that teachers with 1-5 years of professional seniority have a positive attitude regarding educational research. Similarly, in their study concerning the attitudes of biology, physics, and chemistry teachers towards educational research, Pekel and Akcay (2016) found that young teachers have a positive attitude regarding educational research. In addition, in their study of the attitudes of primary school teachers towards educational research, Sahin and Arcagok (2013) found that young teachers were willing to practice theoretical knowledge that they had learnt in the preservice period, which encouraged teachers to carry out their own research. Konokman, Tanrıseven and Karasolak (2013) supported this positive attitude by preservice teachers by explaining that they take part in research and communicate with instructors who are carrying out research in education departments. According to Sozbilir (2007), during their teacher training, pre-service teachers debate on scientific platforms, undertake small-scale projects, and follow educational research to improve their level of understanding and put their knowledge into practice. Ekiz and Yigit (2012) emphatically stated that teachers can only execute research if they benefit from scientific research courses before starting their teaching career.

For teachers with 1-5 years of professional seniority, the finding "following journals related to his/her profession" was found to be meaningful. Their more

positive attitude towards educational research is related to the fact that the teachers have only been involved in the profession for under 5 years. Accordingly, teachers who have just started teaching have a more positive attitude towards following education-related journals due to their positive attitudes towards educational research, which shows that they are open to novel ideas. In a study of students, teachers, and researchers, Berber (2013) stated that there is close relationship between a culture of research and being interested in scientific research. Kucukoglu, Tasgın and Celik (2013) stated that the views that pre-service teachers express towards researchers are related to following journals about scientific research, and skills and knowledge about research methods and techniques. Ekiz and Yigit (2012) emphasised that teachers are expected to be aware of the results of educational research and use them effectively in their classes. That teachers have innovative perspectives by following occupational publications related to their individual innovative perceptions. Erdogan and Gunes (2013) also underlined the evidently strong relationship between the innovative perceptions of pre-service teachers and their openness to innovation and new experiences, as also proposed by Demiraslan and Usluel (2008). Teachers should ensure effective uses of technology in the classroom and need to be able to design new educational methods and teaching strategies. Ritchhart (2004) is of the opinion that innovative teachers are able to develop in their profession, try novel approaches in accordance with recent teaching-learning strategies, use different methods to increase student participation, and implement new skills by changing habits. Basaran and Keles (2015) found that the individual innovativeness level of teachers with 1-5 years of work experience was higher than teachers with more than 5 years of professional seniority.

It was found that teachers with more than 5 years of professional seniority and working in cities had a more positive attitude towards educational research, from which we may conclude that these teachers are more conscious about fulfilling occupational responsibilities and, therefore, tend to follow innovations and educational research in order to develop themselves (Korkmaz & Sadık, 2011). In a study of occupational attitudes of teachers working in cities, it was reported that, when teachers increase their competence at blending theory and practice, they succeed in fulfilling the requirements of their profession. (Mooji, 2008) claimed that senior teachers consider the teaching profession as requiring great responsibility, to which Tanrıverdi and Erisen (2010) added that the occupational attitudes of senior teachers are more positive. Furthermore, a result of the study of Basaran and Keles (2015) demonstrated that teachers working in cities are more innovative than teachers employed in counties and towns.

Lastly, the gender variable among teachers who follow occupational journals was found significant, since women were shown to have a more positive attitude towards educational research. Konakman, Tanrıseven and Karasolak (2013) found that the female teachers display more positive attitudes towards their job than male teachers. Female teachers also have a more positive attitude towards scientific research, and their individual inventiveness level is higher than that of males. This is supported by the literature, studies of pre-service teachers have demonstrated that female teachers display more positive attitudes towards their jobs than male teachers (Pehlivan, 2008; Camadan & Duysak, 2010; Ilter & Koksalan, 2011; Aydın & Saglam, 2012; Ipek, Kahveci & Camadan, 2015).

Teacher attitudes play an important role in fulfilling the requirements of the occupation (Durmusoglu, Yanık & Akkoyunlu, 2009), as attitudes and perceptions towards a profession affect perceptions of professional competence and success in the occupation (Terzi & Tezci, 2007). Studies examining the attitude of teachers towards scientific research are usually performed on pre-service teachers. Korkmaz, Sahin and Yesil (2011b) showed that female pre-service teachers are more willing to help researchers and have a more positive attitude towards research, a finding also underlined by Kurt, Izmirli, Fırat and Izmirli (2011). Basaran and Keles (2015) stated that female teachers are more innovative and inquisitive than male teachers, who are more traditionalist. Traditionalist teachers, it should be noted, have difficulties in using new techniques and approaches in class. It is seen in the study of Ayhan, Tuncay, Sancar, Deniz and Yılmaz (2012) on preservice teachers that there is a significant relationship between gender and innovativeness and that female pre-service teachers are more innovative than male teachers, a point also expressed by Cuhadar, Bulbul and Ilgaz (2013) and Korucu and Olpak (2015), who stated that female pre-service teachers' innovativeness, pioneering and questioning is higher than those of male teachers. In the study of Erdogan and Gunes (2013) of the relationship between the individual innovativeness levels of education faculty students and their level of acceptance of change, it is seen that female teachers are more willing to accept change than male teachers and accept changes earlier than male teachers. It can, therefore, be concluded that female teachers have more positive attitudes towards following journals about their occupation than male teachers because they have more a positive attitude on teaching, scientific research, innovativeness, and acceptance of change, as evidenced by the results of related studies.

According to the study results, in-service training and required activities should be organised and provided for teachers who have completed five years in the teaching profession by the Ministry of National Education and relevant university departments in order to promote teacher attitudes towards education research and the willingness to follow publications related to their fields.

References

Ahuja, S. (2012). Research results for quality schooling: bridging the gap between research and practice. *MIER Journal of Educational Studies, Trends & Practices,* 2(2), 206-214.

Ates, S., & Yildirim, K. (2015). Turk ogretmenlerin gozuyle egitim arastirmalarinin uygulamaya yansima durumu [Translating educational research findings into practice: A perspective from turkish teachers]. *Mustafa Kemal Universitesi Sosyal Bilimler Enstitusu Dergisi*, 12(29), 110-132.

Aydin, R., & Saglam, G. (2012). Ogretmen adaylarinin ogretmenlik meslegine yonelik tutumlarinin belirlenmesi (Mehmet Akif Ersoy Universitesi Ornegi) [Teacher applicant's view directed towards to profession of teacher

(Example of Mehmet Akif Ersoy University)]. *Turk Egitim Bilimleri Dergisi,* 10(2), 257-294.

AytaC, M., & Ongen, B. (2012). Dogrulayici faktor analizi ile yeni cevresel paradigma olceginin yapi gecerliliginin incelenmesi [The structure of environmental attidutes: first-order confirmatory factor analysis]. *İstatistikciler Dergisi*, 5, 14-22.

Bas, F. (2017). Matematik ogretmenlerinin egitim arastirmalarini takip etme durumlari ve arastirmalara yonelik tutumlari: Turkiye ornegi [Mathematics teachers' following educational researches and attitudes towards educational research: An example from Turkey]. *Egitim ve Bilim*, 42(189), 249-267.

Basaran, D. S., & Keles, S. (2015). Yenilikci Kimdir? Ogretmenlerin yenilikcilik duzeylerinin incelenmesi[Who is Innovative? Examination of teachers' innovativeness level]. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 30(4), 106-118.

Bayram, N. (2010). *Yapisal Esitlik Modellemesine Giris*, Bursa: Ekin Kitabevi.

Berber, N.C. (2013). Ortaogretim ogrencilerinin ve ogretmenlerinin egitim arastirmalarina bakisi [Views of secondary-education students and teachers on educational researches]. *Buca Egitim Fakultesi Dergisi,* 36, 142-159.

Biesta, G. (2007). Bridging the gap between educational research and educational practice: The need for critical distance. *Educational Research and Evaluation,* 13(3), 295-301.

Broekkamp, H., & van Hout-Wolters, B. (2007). The gap between educational research and practice: A literature review, symposium, and questionnaire Educational. *Research and Evaluation*, 13(3), 203 - 220.

Buyukozturk, S., Cakmak, E. K., Akgun, O. E., Karadeniz, S., & Demirel, F. (2012). *Bilimsel arastirma yontemleri.* Ankara: Pegem Akademi.

Camadan, F., & Duysak, A. (2010). Farkli programlardaki ogretmen adaylarinin ogretmenlik meslegine yonelik tutumlarinin cesitli degiskenler acisindan karsilastirilmasi: Rize Universitesi ornegi [Comparing pre-service teachers' attitudes in the different programs toward teaching profession in terms of different variables: Example Of Rize University]. *Sakarya Universitesi Egitim Fakultesi Dergisi*, 20, 30-42.

Can, N. (2004). Ogretmenlerin gelistirilmesi ve etkili ogretmen davranislari. *Erciyes Universitesi Sosyal Bilimler Enstitusu Dergisi*, 16, 103- 119.

Chen, Z., & Kou, L. (2001). A note on the estimation of the multinominal logit model with random effects. *The American Statisticion, 55*(2), 89-95.

Counsell, C., Evans, M., McIntyre, D., & Raffan, J. (2000). The usefulness of educational research for trainee teachers' learning. *Oxford Review of Education*, 26(3), 467-482.

Cousins, J., & Walker, C. (2000). Predictors of educators' valuing of systematic inquiry in schools. *Canadian Journal of Program Evaluation*, 15, 25-52.

Celik, H.C., Satici, O., & Celik, M.Y. (2005). Saglik personellerinde kronik sigara icme aliskanligi olanlarin tutumlarina iliskin degiskenlerin kumeleme analizi (cluster analyses) [The cluster analysis of variables about attitudes of chronic smokers among health staffs]. *Dicle Tip Dergisi*, 32(1), 20-25.

Cuhadar, C., Bulbul, T., & Ilgaz, G. (2013). Ogretmen adaylarinin bireysel yenilikcilik ozellikleri ile teknopedagojik egitim yeterlikleri arasindaki iliskinin incelenmesi [Exploring of the relationship between individual innovativeness and techno-pedagogical education competencies of pre-service teachers]. *Ilkogretim Online*, 12(3), 797-807.

Demirarslan, Y., & Usluel, Y.K. (2008). ICT integration processes in turkish schools: using activity theory to study issues and contradictions, *Australasian Journal of Educational Technology*, 24(4), 458-474.

Durmusoglu, M. C., Yanik, C. & Akkoyunlu, B. (2009) Turk ve Azeri ogretmen adaylarinin ogretmenlik meslegine yonelik tutumlari [Turkish and Azerbaijani prospective teachers' attitudes to their profession]*Hacettepe Universitesi Egitim Fakultesi Dergisi,* 36, 76-86.

Ekiz, D., & Yigit, N. (2012). Ogretmen adaylarinin egitim arastirmalarinin amac ve cesitleri hakkindaki goruslerinin incelenmesi[Evaluation of the physical education teachers behaviors in terms of hidden program in the light of students' views]. *Sakarya Universitesi Egitim Fakultesi Dergisi*, 23, 3-21.

Ekiz, D. (2006). Sinif ogretmenlerinin egitim arastirmalarina karsi tutumlari[Primary school teachers' attitudes towards educational research].*Kuram ve Uygulamada Egitim Bilimleri*, 6(2), 373-394.

Erdogan, D. G., & Gunes, D. Z. (2013). The relationship between Individual innovatiness and change readiness conditions of students attending faculty of education. *Procedia-Social and Behavioral Sciences*, 106, 3033-3040.

Everitt, B.S. (1994 July 7). Statistical methods in medical investigations (second edition). New York: John Wiley & Sons.

Everton, T. Galton, M., & Pell, T. (2002). Educational research and the teacher. *Research Papers in Education, 17*(4), 373-401.

Everton, T., Galton, M., & Pell, T. (2000). Teachers' perspectives on educational research: Knowledge and context. *Journal of Education for Teaching*, 26(2), 167-182.

Genc, M. (2006). Egitim orgutlerinde ogretmenlerin degisime karsi gosterdigi direnc. [Yayimlanmamis yuksek lisans tezi], *Yeditepe Universitesi Sosyal Bilimler Enstitusu*, Istanbul.

Geray, H. (2006). *Toplumsal Arastirmalarda Nicel ve Nitel Yontemlere Giris* (2. baski). Ankara: Siyasal Kitabevi.

Hébert, M., Delphine Collin-Vézina, D., Daigneault, I., Nathalie Parent, N., & Tremblay, C. (2006). Factors linked to outcomes in sexually abused girls: a regression tree analysis. *Coprehensive Psychiatry*, 47, 443-455.

Hemsley-Brown, J., & Sharp, C. (2003). The use of research to improve professional practice: A systematic review of the literature. *Oxford Review of Education*, 29(4), 449-471.

InternetResource: https://www.american.edu/ctrl/upload/SPSS_Regression_Spring_2010.pdf, accessed 18 september 2015.

Ilhan, N., Sekerci, A. R., Sozbilir, M., & Yildirim, A. (2013). The development of teachers attitude scale towards educational research: The validity and reliability study. *Bati Anadolu Egitim Bilimleri Dergisi*, 4(8), 31-56.

Ilter, I., & Koksalan, B. (2011). Sinif ogretmeni adaylarinin ogretmenlik meslegine olan tutumlari [Attitudes of classroom teacher candidates toward teaching profession]. *Firat Universitesi Sosyal Bilimler Dergisi,* 21(1), 113-128.

Ipek, C., Kahveci, G., & Camadan, F. (2015). Sinif ogretmeni adaylarinin ogretmenlik meslegine ve okul yoneticiligine yonelik tutumlari[The attitudes of pre-service class teachers towards teaching profession and school principalship].*Kastamonu Egitim Dergisi,* 23(1), 211-226.

Isman, A., Altinay-Aksal, F., & Altinay-Gazi, Z. (2009). Ogretim gorevlisi arastirmacilar: Eylem arastirmasinda teknoloji ve etik konularina yonelik dusunceleri [Teacher researchers: Technology and ethical considerations while conducting an action research]. *Hacettepe Universitesi Egitim Fakultesi Dergisi,* 37, 84-95.

Jin, J., Tang, Y. Y., Ma, Y., Lv, S., Bai, Y., & Zhang, H. (2009). A structural equation model of depression and the defense system factor: A survey among Chinese college students. *Psychiatry Research*, 165(3), 288-296.

Joram, E. (2007). Clashing epistemologies: aspiring teachers', practicing teachers', and professors' beliefs about knowledge and research in education. *Teaching and Teacher Education*, 2(23), 123-135.

Joreskog, K. G., & Sorbom, D. (1993). LISREL 8: Structural equation modeling with the SIMPLES command language. Scientific Software International/ Erlbaum.

Kalayci, S. (2005). SPSS Uygulamali cok degiskenli istatistik teknikleri, Ankara: Asil Yayin Dagitim.

Karasar, N. (2007). *Bilimsel arastirma yontemi* (17. Baski). Ankara: Nobel Yayinevi

Kayri, M. (2007). Arastirmalarda iki asamali kumeleme analizi ve bir uygulamasi [Two-Step Clustering analysis in researches: A case study]. *Eurasian Journal of Educational Research*, 28, 89-99.

Kayri, M., & Gokdas, I. (2006). Karisimli model analiz tekniginin egitim bilimleri arastirmalarinda uygulanabilirligi uzerine bir arastirma ornegi[The possible

use of mixture model analysis technique in the educational sciences: A case study]. *Educational Sciences: Theory & Practise, 6*(3), 753-778.

Kayri, M., & Boysan, M. (2008). BiliSsel yatkinlik ile depresyon duzeyleri iliskisinin siniflandirma ve regresyon agaci analizi ile incelenmesi[Assesment of relation between cognitive vulnerability and depression's level by using classification and regression tree analysis]. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 34, 168-177.

Kelloway, E. K. (1998). Using lisrel for structural equation modeling. United States of America, Sage Publication.

Kilic, A., & Acat, M. B. (2007). Ogretmen adaylarinin algilarina gore ogretmen yetistirme programlarindaki derslerin gereklilik ve ise vurukluk duzeyi[Essentiality and job-utility of the courses offered in elementary teacher education programs]. *Sosyal Bilimler Dergisi,* 17, 21-37.

Kilic, A. (2006). Ogretmen adaylarinin ogretmenlik becerilerini uygulama ve gozleme duzeyleri[Levels of observation and practice of teaching skills of student-teachers]. *Duzce Universitesi Sosyal Bilimler Dergisi*, 16, 155-168.

Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York: Guilford.

Konakman, Y.G., Tanriseven, I., & Karasolak, K. (2013). Ogretmen adaylarinin egitim arastirmalarina iliskin tutumlarinin cesitli degiskenlere gore incelenmesi[Examining prospective teachers' attitudes towards educational research according to several variables]. *Ahi Evran Universitesi Kirsehir Egitim Fakultesi Dergisi*, 14(1), 141-158.

Korkmaz, G., & Sadik, F. (2011). Ilkogretim okullarinda gorev yapan ogretmenlerin mesleki tutumlarinin sosyo-demografik ozellikler acisindan incelenmesi. *Cukurova Universitesi Sosyal Bilimler Enstitusu Dergisi*, 20(1), 121-138.

Korkmaz, O., Sahin, A., & Yesil, R. (2011b). Ogretmenlerin bilimsel arastirmalara ve arastirmacilara iliskin dusunceleri[Teachers' opinion regarding scientific researches and researchers]. *Kuramsal Egitimbilim*, 4(2), 109-127.

Korkmaz, O., Sahin, A., & Yesil., R. (2011a). Bilimsel arastirmaya yonelik tutum olcegi gecerlilik ve guvenirlik calismasi[Study of validity and reliability of scale of attitude towards scientific research]. *Elementary Education Online*, 10(3), 961-973.

Korucu, T. A., & Olpak, Z.Y. (2015). Ogretmen adaylarinin bireysel yenilikcilik ozelliklerinin farkli degiskenler acisindan incelenmesi[Examination of teacher candidates individual innovativeness properties from the different variables]. *Egitim Teknolojisi Kuram ve Uygulama*, 5(1), 111-127.

Koklu, N., Buyukozturk, S., & Bokeoglu, O. C. (2006). Sosyal bilimler icin istatistik. Ankara: Pegem-A Yayincilik.

Kurt, A. A., Izmirli, O. S., Firat, M., & Izmirli, S. (2011). Bilimsel arastirma yontemleri dersine iliskin bilgisayar ve ogretim teknolojileri egitimi bolumu

ogrencilerinin goruslerinin incelenmesi[An investigation of computer education and instructional technology students' views about the scientific research methods course]. *Dumlupinar Universitesi Sosyal Bilimler Dergisi*, 30, 19-28.

Kucukoglu, A., Tasgin, A., & Celik, N. (2013). Ogretmen adaylarinin bilimsel arastirma surecine iliskin gorusleri uzerine bir inceleme (Egitim Bilimleri Bolumu Ornegi)[An investigation of prospective teachers' perceptions toward scientific research process (The case of educational science department)]. *Turkiye Sosyal Arastirmalar Dergisi*, 17(3), 11-24.

Lewis, C. A., Francis, L. J., Shevlin, M., & Forrest, S. (2002). Confirmatory factor analysis of the french translation of the abbreviated form of the revised eysenck personality questionnaire (EPQR-A). *European Journal of Psychological Assessment*, 18(2), 179-185.

McMillan, J. H., & Schumacher, S. (2006). Research in education: Evidence-based inquiry (sixth Edition). Boston: Pearson.

Milli Egitim Bakanligi (MEB). (2008). Ogretmen yeterlikleri: ogretmenlik meslegi genel ve ozel alan yeterlikleri. Ogretmen Yetistirme ve Egitimi Genel Mudurlugu. Ankara: Milli Egitim Mudurlugu Devlet Kitaplari Mudurlugu.

Mooji, J. (September 2008). Primary education, teachers'professionalism and social class about motivation and demotivation of government school teachers in India, *International Journal of Education Development*, 28, 508–523.

Mortimore, P. (2000). Does educational research matter? *British Educational Research Journal*, 26(1), 5-24.

Okut, H. Duncan, T. E., Susan, S. C., & Strycker, L. A. (2002, August). Latent variable mixture modeling: Analyzing mixture and the structural portion of model. *Joint Statistical Meetings* (JSM), New York, USA.

Olivares, J., Garcia-Lopez, L. J., Hidalgo, M. D., & Caballo, V. (2004). Relationships among social anxiety measures and their invariance. *European Journal of Psychological Assessment,* 20(3), 172-179.

Ozdamar, K (2002). Paket programlari ile istatistiksel veri analizi (cok degiskenli analizler). Eskisehir: Kaan Kitabevi.

Ozturk, M. A. (2010). An exploratory study on measuring educators' attitudes toward educational research. *Educational Research and Reviews*, 5(12), 758-769.

Papanastasiou, E. C. (2005). Factor structure of the "Attitudes Toward Research" scale. *Statistics Education Research Journal*, 4(1), 16-26.

Pehlivan, B. K. (2008). Sinif ogretmeni adaylarinin sosyo-kulturel ozellikleri ve ogretmenlik meslegine yonelik tutumlari uzerine bir calisma[A study on pre-service classroom teachers' socio-cultural properties and their attitudes toward teaching occupation as a subject]. *Mersin Universitesi Egitim Fakultesi Dergisi*, 4(2), 151-168.

Pekel, O., F., & Akcay, S. (2016). Biyoloji, fizik, kimya ogretmenlerinin egitim arastirmalarina yonelik tutum ve farkindaliklari. *I. Ulusal Biyoloji Egitimi Kongresi*, (27-28 Mayis), Ankara.

Punch, K. F. (2005). Sosyal Arastirmalara Giris: Nicel ve Nitel Yaklasimlar, (Cev: D. Bayrak, H.B. Arslan ve Z. Akyuz). Ankara: Siyasal Kitabevi.

Ravitz, J., Hixson, N., English M., & Mergendoller, J. (2012). Using project based learnign to teach 21st century skills: Findings from a statewide initiative. *Paper presented at Annual Meetings of the American Educational Research.* Vancouver, BC.

Ritchhart, R. (2004). Creative teaching in the shadow of the standards. *Independent School*, 63, 32–40.

Rossouw, D. (2009). Educators as action researchers: some key considerations. *South African Journal of Education,* 29, 1-16.

Sanders, R. D., Allen, D. N. D. Forman, S., Tarpey, T., Keshavan, M. S., & Goldstein, G. (2005). Confirmatory factor analysis of the neurological evaluation scale in unmedicated schizophrenia. *Psychiatry Research*, 133, 65-71.

Sari, M. (2006). Arastirmaci Ogretmen: Ogretmenlerin bilimsel arastirmaya iliskin goruslerinin incelenmesi[Teacher as a researcher: Evaluation of teachers' perceptions on scientific research]. *Kuram ve Uygulamada Egitim Bilimleri, 6*(3), 847-887.

Schermelleh-Engel, K., Moosbrugger, H., & Muller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23-74.

Smolleck, L. D., Zembal, S. C., & Yoder, E. P. (2006). The development and validation of an instrument to measure preservice teachers' self-efficacy in regard to the teaching of science as inquiry. *Journal of Science Teacher Education*,17, 137-163.

Sozbilir, M. (2007). First steps in educational research: The views of Turkish chemistry and biology student teachers. *European Journal of Teacher Education*, 30(1), 41-61.

Sahin, A. (April 2011). Ogretmen algilarina gore etkili ogretmen davranislari[Effective teacher's attitudes according to teacher's perceptions]. *Ahi Evran Universitesi Egitim Fakultesi Dergisi,* 12(1), 239-259.

Sahin, C., & Arcagok, S. (2013). İlkogretim ogretmenlerinin egitim arastirmalarina yonelik yaklasimlari[Elementary school teachers' approaches towards educational research]. *Bilgisayar ve Egitim Arastirmalari Dergisi*, 1(2), 1-21.

Senol, S. (2012). Arastirma ve Ornekleme Yontemleri. Ankara: Nobel Yayinlari.

Tanriverdi, H.D., & Erisen, Y. (2010). Okuloncesi egitimi ogretmenlerinin meslege yonelik tutumlariyla yeni okuloncesi egitim programinin hedeflerine ulasilma derecesi arasindaki iliskinin degerlendirilmesi[The evaluation of

the relationship between preschool teachers' professional attiudes and the reaching levels towards the goals and aims of new preschool teaching program]. *e-Journal of New World Sciences Academy,* 5(4), 1643-1657.

Tasdemir, M., & Tasdemir, A. (2011). Scientific research review competences of prospective teachers. *Selcuk Universitesi Sosyal Bilimler Enstitusu Dergisi*, 26, 344-53.11.

Tavsancil, E. (2006). Tutumlarin olculmesi ve SPSS ile veri analizi (3.Baski) Ankara: Nobel.

Terzi, A. R., & Tezci E. (2007) Necatibey Egitim Fakultesi ogrencilerinin ogretmenlik meslegine iliskin tutumlari[The attitudes of the students towards teaching profession at Necatibey Education Faculty].*Kuram ve Uygulamada Egitim Yonetimi*, (52), 593-614.

Ucgun, D., & Unal, E. (2015). Turkce ve sinif ogretmenlerinin egitim arastirmalarina yonelik tutumlarinin incelenmesi[Evaluation of turkish and primary school teachers' attitudes towards education researches]. *Erzincan Universitesi Sosyal Bilimler Enstitusu Dergisi*, 2, 85-94.

Vanderlinde, R., & van Braak, J. (2010). The gap between educational research and practice: views of teachers, school leaders, intermediaries and researchers. *British Educational Research Journal*, 36(2), 299-316.

Walker, D., A. (2010). The attitudes toward research scale. *Multiple Linear Regression Viewpoints*, 36(1), 18-26.

Walter, O., & Hen, M. (2012). Bridging the gap between research and practice in teachers preparation. *Universal Journal of Education and General Studies, 1*(7), 216-224.

Waltz, C. F., Strcikland, O. L., & Lenz, E.R. (2010). Measurement in nursing and health research. (Four Edition) New York: Springer Publishing Company.

Yavuz, M. (2009). Egitim arastirmalari ile ilgili ogretmen ve yonetici goruslerinin analizi[An Analysis of thought of teachers and principals on educational research].*Selcuk Universitesi Ahmet Kelesoglu Egitim Fakultesi Dergisi*, 27, 143-158.

Yildirim, A., Ilhan, N., Sekerci, A. R., & Sozbilir., M. (2014). Fen ve Teknoloji Ogretmenlerinin egitim arastirmalarini takip etme, anlama ve uygulamalarda kullanma duzeyleri: Erzurum ve Erzincan Ornegi[Science Teachers' level of following, understanding and using of educational researches: The Example Of Erzurum And Erzincan].*Kastamonu Egitim Dergisi*, 22(1), 81-100.

Yilmaz, F., Sogukcesme, G., Ayhan, N., Tuncay, S., Sancar, S., & Deniz, Y. M. (2014). Ilkogretim bolumu ogretmen adaylarinin mesleki yenilikcilik egilimlerini cesitli degiskenler acisindan incelenmesi[Investigating pre-service elementary department teachers' Professional innovativeness tendencies in terms of various variables]. *Mustafa Kemal Universitesi Sosyal Bilimler Enstitusu Dergisi,* 11(27), 259-276.

Lise Ogretmelerinin Egitim Arastırmalarına Yonelik Tutumlarının Sınıflandırma Agacı Yontemi Ile Incelenmesi

Özet

Problem Durumu: Bireylere araştırma-inceleme, problem çözme ve eleştirel düşünme becerilerini kazandırmakla yükümlü olan öğretmenlerin öncelikle kendilerinin bu beceri ve yeterliklere sahip olmalarıyla birlikte bilimsel araştırmalara karşı olumlu tutum içerisinde olmaları gerekmektedir. Bu bağlamda öncelikli olarak öğretmenlerin araştırma yapmaya istekli olmaları, bilimsel araştırmalar yapabilmeleri, bilimsel araştırma yaparken bilgi ve iletişim teknolojilerini kullanabilmeleri, verileri analiz edebilmeleri ve analiz sonuçlarını yöneticiler ve diğer eğitimcilerle paylaşabilmeleri gerekmektedir. Öğretmenlerin gelişim ve değişime ayak uydurabilmeleri, öncelikle araştırma bilgi ve becerilerine sahip olmalarını yapılan araştırmalara düşünce ve eylemleri ile katkı sağlamalarını, araştırmalara ve araştırmacılara karşı olumlu bir tutum içerisinde olmalarını gerektirir. Öğretmenlerin mesleki gelişimlerine katkı sağlayacak başlıca kaynaklar ise araştırma süreçlerinin kavramsallaştırılması, gözlemlenmesi ve sistematik olarak kaydedilmesi, gözlemlenen verilerin analiz edilmesi ve elde edilen verilerin yayımlanması olarak tanımlanan eğitim araştırmalarıdır. Bu anlamda, amacı 'eğitim uygulamalarının anlaşılması ve geliştirilmesi olan eğitim araştırmalarından yararlanma yollarının etkin kullanımına ilişkin bilgilerin ve güncel eğitim araştırmalarına ulaşma yollarının öğretmenler tarafından bilinmesi beklenmektedir. Öğretmenlerin kendileri araştırma becerilerinden yoksunlar ise ve alanda yapılan bilimsel çalışmaları etkili bir şekilde incelemiyorsalar yetiştirecekleri bireylerinde araştırma kültürü kazandırmaları çok zordur. Etkili bir öğretmende bulunması gereken en önemli özellik alanıyla ilgili yenilikleri yakından takip ederek bilgilerini güncellemesidir. Bir öğretmenin ifade edilen bu kazanımları elde etmesi ise öncelikle alanı ile ilgili yapılan eğitim araştırmalarını yakından takip etmesi ile sağlanabilir. Fakat ilgili literatür incelendiğinde, öğretmenlerin eğitim araştırmalarına ilgi göstermediği, yaklaşık olarak bütün çalışmaların ortak sonucu olarak ortaya çıkmaktadır. Eğitim araştırmalarının, özellikle uygulamada yaşanan sorunların çözümüne çok az katkı sağladığı ve uygulayıcılar olan öğretmenlerin eğitim araştırmalarına karşı olumsuz bir tutuma sahip olduğu bilinmektedir. Yapılan bu çalışma ile öğretmenlerin eğitim araştırmalarına yönelik tutumlarında demografik değişkenlerinin etkileri derinlemesine incelenerek, öğretmenlerin eğitim araştırmalarına yönelik tutumlarını olumlu yönde geliştirmek ve bu doğrultuda öğretmenlere önerilerde bulunmak amacıyla konu araştırılmaya değer görülmüştür.

Araştırmanın Amacı: Bu araştırmanın temel amacı, lise öğretmenlerinin eğitim araştırmalarına ilişkin tutumlarını demografik değişkenler açısından incelemek ve öğretmenlerin demografik değişkenlerine göre eğitim araştırmalarına yönelik tutumlarındaki değişimleri belirlemektir.

Araştırmanın Yöntemi: Bu araştırmada, öğretmenlerin eğitim araştırmalarına yönelik tutumları üzerinde etkisi olabilecek bazı değişkenlerin incelenmesi amaçlandığından, tarama modelleri içerisinden ilişkisel tarama modeli kullanılmıştır. Tarama modeli, "çok sayıda elemandan oluşan bir evrende, evren hakkında genel bir yargıya varmak amacıyla, evrenin tümü ya da ondan alınacak bir grup, örnek ya da örneklem üzerinde yapılan tarama düzenlemeleri" olarak tanımlanmaktadır (Karasar, 2007). Araştırmanın örneklemini büyükşehir, şehir ve ilçe olmak üzere farklı yerleşim yerlerinde görev yapmakta olan 11 farklı branşta toplam 669 öğretmen oluşturmaktadır. Elde edilen verilerin analizin de SPSS 21.0 (Statistical Package for Social Sciences) programı kullanılmıştır.

Araştırmanın Bulguları: Araştırma kapsamında elde edilen bulgulardan, öğretmenlerin eğitim araştırmalarına yönelik tutumları üzerinde en yüksek etkiye sahip değişkenin mesleki kıdem değişkeni olduğu belirlenmiştir. Bu bulguya göre, meslekte 1-5 yıl arası görev yapan öğretmenlerin eğitim araştırmalarına yönelik tutumları meslekte 5 yıl ve üzeri bir süredir görev yapan öğretmenlerden daha yüksek çıkmıştır. Meslekte geçirdiği süre 1-5 yıl olan öğretmenler arasında da "Alanıyla ilgili bilimsel yayınları takip etme" durumu anlamlı bulunmuştur. Ayrıca mesleğinde 5 yıldan fazla bir süredir görev yapan öğretmenler arasında şehirde görev yapan öğretmenlerin eğitim araştırmalarına yönelik tutumlarının daha yüksek olduğu tespit edilmiştir. Son olarak alanı ile ilgili bilimsel yayınları takip eden öğretmenler arasında cinsiyet değişkeni anlamlı bulunmuştur. Alanı ile ilgili bilimsel yayınları takip eden öğretmenler arasında da bayan öğretmenlerin erkek öğretmenlere oranla eğitim araştırmalarına yönelik tutumlarının daha olumlu olduğu belirlenmiştir.

Araştırmanın Sonuçları ve Önerileri: Öğretmenlik mesleğine yeni başlayan öğretmenlerin eğitim araştırmalarına yönelik tutumlarının yüksek olması ve alanları ile yayınları takip etme konusunda daha olumlu bir tutuma sahip olması birbirini destekleyen bulgulardır. Öğretmenlik mesleğine yeni başlayan öğretmenlerin hem eğitim araştırmalarına hem de alanları ile ilgili yayınları takip etmeye yönelik olumlu bir tutum içerisinde olmalarının nedenleri arasında öğretmenlerin gerek lisans eğitimi süresince gerekse meslek öncesi eğitimlerinde bilimsel araştırmalarla ilgili uygulamalar sonucunda edindikleri olumlu tutumlar olabileceği gibi, göreve yeni başlayan genç öğretmenlerin bireysel yenilikçilik algılarının da yüksek olmasının da eğitim araştırmalarına ve alanları ile ilgili yayınları takip etmeye yönelik tutumlarını olumlu yönde etkilediği düşünülmektedir. Buna ek olarak, meslekte uzun süredir görev yapan öğretmenler arasında da şehirde görev yapan öğretmenlerin eğitim araştırmalarına yönelik tutumlarının daha yüksek olduğu tespit edilmiştir. Elde edilen bu sonuç incelendiğinde, şehirde görev yapan ve mesleki kıdemi 5 yıldan fazla olan öğretmenlerin mesleğe yönelik tutumlarının olumlu olduğu ve mesleki sorumluluklarını yerine getirme konusunda daha bilinçli olduğu düşünülmektedir.

Bu durum sonucunda öğretmenlerin mesleki gelişimleri için gerekli yenilikleri takip etme ve kendilerini geliştirmek adına eğitim araştırmalarını incelemeye yöneldiği ve bu durumundan dolayı da şehirde görev yapan ve mesleki kıdemi 5 yıldan fazla olan öğretmenlerin eğitim araştırmalarına yönelik tutumlarının daha olumlu olduğu düşünülmektedir. Son olarak alanı ile ilgili bilimsel yayınları takip eden öğretmenler arasında cinsiyet değişkeni anlamlı bulunmuştur. Alanı ile ilgili bilimsel yayınları takip eden öğretmenler arasında da bayan öğretmenlerin erkek öğretmenlere oranla eğitim araştırmalarına yönelik tutumlarının daha yüksek olduğu belirlenmiştir. Bu durumun muhtemel nedenleri arasında, bayan öğretmenlerin erkek öğretmenlere oranla gerek öğretmenlik mesleğine gerekse bilimsel araştırmalara yönelik tutumlarının daha olumlu olmasından kaynaklandığı düşünülmektedir.

Elde edilen bu sonuçlara göre, öğretmenlik mesleğinde özellikle 5 yılını dolduran öğretmenlere yönelik olarak, gerek Milli Eğitim Bakanlığı gerekse Üniversitelerin ilgili birimleri tarafından hizmet içi eğitim faaliyetleri düzenlenerek, öğretmenlerin eğitim araştırmalarına ve alanları ile ilgili yayınları takip etmeleri konusunda ki tutumlarını geliştirici etkinlikler yürütülmelidir.

Anahtar Kelimeler: Lise öğretmenleri, eğitim araştırmaları tutum, sınıflandırma ağacı yöntemi, birinci ve ikinci düzey doğrulayıcı faktör analizi