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Examination of the Attitudes of Preschool Teacher Candidates and Teacher Candidates in Other Branches Towards Scientific Research in Terms of Some Variables

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Abstract: The main objective of this study is to examine the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research in terms of some variables. Survey method was used. The study group consists of 547 teacher candidates studying in education faculty of a private university in the spring term of 2015-2016 in Istanbul province. Personal Information Form, Scale of Attitude towards Scientific Research were used as data collection tool. According to the results; Preschool teacher candidates' levels of reluctance to help researchers and negative attitudes towards research are lower when compared to Turkish language teacher candidates. Preschool teacher candidates' positive attitudes towards researchs and researchers are higher when compared to Turkish language teacher candidates. Guidence and psychological counselor candidates' negative attitudes towards research are lower when compared to Turkish language teacher candidates. The levels of reluctance to help researchers of male teacher candidates are higher when compared to female teacher candidates. Negative attitudes towards research of the teacher candidates who do not take the course of scientific research methods are higher when compared to the teacher candidates who take the research methods course. The teacher candidates' attitudes towards research do not vary by age, grade level and the academic success average.

Keywords: *Preschool teacher candidate, attitude towards scientific research.*

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Introduction

It is observed that the scientific development levels of the modern countries around the world which are regarded to be developed are also advanced because the countries tend to take being advanced in science as a basis for ensuring the welfare and development of the societies. The way to ensure development in science and to overcome the obstacles before the countries in the way of becoming a "modern and developed" society is proportional to the contribution they provide to the scientific research culture. For this, it is necessary for societies' attitudes towards scientific research to be positive and at an improvable level (Polat, 2014).

Scientific research is defined as data collecting and analysis of the collected data in accordance with a certain purpose and through systematic processes (McMillan & Schumacher 2010). Research is regarded to be the cornerstone of scientific developments (Marczyk at al., 2005). One of the most characteristic qualities of the scientific research is that it consists of a number of steps following each other. The research process starting with the perception of a problem includes determining the methods to be followed and fulfilling the requirements, collecting the data, processing the data, developing result and recommendations that will form a solution to a problem based on the data, recording the process and the result achieved (Madsen, 1991; Cone & Foster, 1993; Bolker, 1998; Llewellyn, 2002).

In the conception of education of the 21st century, it is emphasised that raising individuals who can recognise the problems and have the ability to solve them, who can use research techniques and have a positive attitude towards scientific research has come to the forefront (Bektur, Yasar, Kucukkaragoz, Titiz, 1997; Hoshmand, 1991; Uzunoglu, 1997). In order to produce information, the individual has to have the ability to think scientifically. In today's society, that an individual has the ability to think scientifically has become a necessity rather than an extra skill. Therefore, raising individuals who can think scientifically takes place among the primary goals of the education systems (Ata & Yenilmez, 2012).

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Teachers are among the people who have the biggest responsibility in the education system to raise individuals who inquire and question. In other words, it is regarded as an important necessity that today's teachers should have enough information and skills and have a positive attitude towards scientific research. As a result of this necessity, there is a scientific research methods course at each department of education faculties. Thus, it is aimed that teacher candidates acquire positive attitude towards scientific research and researchers with the basic information and skills related to scientific research (Korkmaz at al., 2011a).

When the literature related to the subject is examined, studies on the views, opinions, and attitudes of teachers and teachercandidates towards scientific research, their state of being able to follow studies, to understand the research results and to use them in the class applications are encountered (Bahtiyar & Can, 2016; Ucgun & Unal, 2015; Cakmak, Taskiran, Bulut, 2015; Cinar & Koksal, 2013; Kaya, Afacan, Polat, Urtekin, 2013; Yenilmez & Ata, 2012; Polat, 2014; Ayaydin & Kurtuldu, 2010; Ulutas, 2009; Costa, Marquez, Kempa, 2000; Cousins & Walker, 2000; Cepni & Kucuk, 2003; De Jong, 2004; Ekiz, 2006; Everton, Galton, Pell, 2000; Gilbert, De Jong, Justi, Treagust, Van Driel, 2003; Gitlin, Barlow, Burbank, Kauchak, Stevens, 1999; Greenwood & Maheadly, 2001; Kempa, 2002; Korkmaz, Sahin, Yesil, 2011b, Korkmaz at al., 2011c; Isakson & Ellsworth, 1978; McIntyre, 2005; Ozturk, 2010; Shkedi, 1998; Yavuz, 2009). Besides this, there are also studies in the literature on providing research skills and research skill levels (Sahin & Altinay, 2009; Tekbiyik & Ipek, 2007); students' and teachers' scientific research proficiencies (Nartgun, Nartgun, Uluman, Akin, Celik, Cevik, Sanli, Gulozer, 2008; Tasdemir & Tasdemir, 2011); scientific research methods course (Papanastasiou & Zembylas, 2008; Kurt, Izmirli, Firat, Izmirli, 2011; Tay, Demirci-Guler, Tasdemir, 2009), on developing the scales of the attitude towards scientific research and scientific research methods course (Papanastasiou, 2014; Yasar, 2014; Korkmaz at al., 2011a; Tavsancil, 1995; Sammy King-fai, 2004; Papanastasiou, 2005; Walker, 2010).

Main Objective and Sub-objectives of the Research

The main objective of this study is to examine the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research in terms of some variables. The sub-objectives determined in line with this main objective are as follows:

- Is there a significant difference between the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research?
- Do the teacher candidates' attitudes towards scientific research vary by age?
- Do the teacher candidates' attitudes towards scientific research vary by gender?
- Do the teacher candidates' attitudes towards scientific research vary by grade level?
- Do the teacher candidates' attitudes towards scientific research vary by the state of taking scientific research methods course?
- Do the teacher candidates' attitudes towards scientific research vary by academic success average?

Methodology

Research Design

Survey method was used in this study as the teacher candidates' attitudes towards scientific research are examined. Survey methods are research approaches that aim to describe the past or existing situation as it is (Karasar, 2015).

Researh Population and Study Group

The population of the study consists of teacher candidates studying in education faculties of universities in Istanbul province. The study group consists of 547 teacher candidates studying in education faculty of a private university in the spring term of 2015-2016 in Istanbul province.

Data Collection Tool

Personal Information Form, Scale of Attitude towards Scientific Research were used as data collection tool.

Personal Information Form: A form structured by the researcher was developed and applied to the participants in the study to acquire information regarding the teacher candidates' teaching branch, age, gender, grade level, the state of taking scientific research methods course and academic success average.

Scale of Attitude towards Scientific Research: The scale was developed by Korkmaz, Sahin and Yesil (2011) and it is a 5-point Likert-type scale containing 30 items. In this 5-point Likert-type scale, the items are scored between 1 and 5 (1=not agree at all, 2=not agree, 3=have no idea, 4=agree 5=completely agree). Sub-scale points are obtained by dividing points acquired from each sub-scale to the number of items in the related sub-scale. Validity and reliability studies are applied by Korkmaz, Sahin and Yesil (2011a). According to the results of the explanatory factor analysis, the inventory was composed of four factors. These factors are reluctance to help researchers, negative attitude towards research, positive attitude towards research and positive attitude towards researchers. When the factor loads, factor eigenvalues and detected variance rates are considered; it can be confirmed that the inventory has structural validity.

In order to confirm the factor structure of the inventory, primary and secondary level confirmatory factor analyses were conducted. As a result of the confirmatory factor analysis; the examined values of the inventory model has coherence according to the results of both primary and secondary confirmatory factor analyses. The correlation value between each item of the inventory and the each factor of inventory vary between 0.571 – 0.767; the fixed correlation value between each item of the inventory and the each factor of the inventory vary between 0.413-0.677. According to the results it can be asserted that each item and each factor in the inventory serve meaningfully in the aim of measuring the desired features in the inventory. Item analysis was conducted in order to determine the discriminative power of 30 items in the inventory and it was determined that every item is discriminative at the desired level. Internal consistency coefficients of the inventory were calculated by using the Cronbach Alpha, Sperman-Brown formula and the Guttmann split-half reliability formula. Within the framework of these values; this confirms that the inventory does produce reliable measurements, in all these factors. In order to determine the time invariance of the items of the inventory, the test-retest method was applied by using the data of the practices conducted every five weeks. According to the results, every item and every factor in the inventory is able to give stable measurements by the way of time invariance (Korkmaz at al., 2011a).

Data Collection

In order to collect the data related to the study, teaching staff working at the education faculty of Sabahattin Zaim University were informed about the study and were taken permission. Then, the data collection tools were applied by going to the classrooms, being distributed to the teacher candidates and the forms applied were collected.

Data Analysis

Data collected for the study were analysed using SPSS 20 program. One-Way Variance Analysis (ANOVA), Tamhane's T2 Test, Scheffe's Test, Kruskal-Wallis H Test and Independent Group t-Test were used in the analysis of the data.

Findings

The findings obtained from the study are tabulated below in the framework of sub-objectives.

Findings on the First Sub-objective

The first sub-objective of the study is to determine whether there is a significant difference between the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research or not. Below, there are findings on the first sub-objective in the form of a table.

Table 1. One-Way Variance Analysis (ANOVA) performed in order to determine whether there is a significant difference between the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research or not

	f . $\bar{X}$ and *ss* Values				ANOVA					
Sub-scales	Group	N	$\bar{X}$	sd	Source of the Variance	*Sum of Squares*	*df*	*Mean Square*	*F*	*P*
Reluctance to help researchers	Preschool education teaching	151	20.92	7.041	Intergroups	723.466	3	241.155	4.749	.003*
	Turkish language teaching	81	24.57	7.141	Intragroup	27625.782	543	50.783		
	English language teaching	90	22.54	7.127	Total	28349.248	546			
	Guidence and counseling	218	22.24	7.181						
	Total	547	22.25	7.199						
Negative Attitude Towards Research	Preschool education teaching	151	19.53	6.660	Intergroups	1674.912	3	558.304	10.637	.000*
	Turkish language teaching	81	24.78	8.915	Intragroup	28501.143	543	52.488		
	English language teaching	90	22.80	6.985	Total	30176.055	546			
	Guidence and counseling	218	21.09	7.067						
	Total	547	21.46	7.434						

Table 1. Contunied

Sub-scales	Group	N	$\bar{X}$	sd	Source of the Variance	*Sum of Squares*	*df*	*Mean Square*	*F*	*P*
Positive Attitude Towards Research	Preschool education teaching	151	25.69	5.838	Intergroups	351.968	3	117.323	3.486	.016*
	Turkish language teaching	81	23.32	5.445	Intragroup	18276.339	543	33.658		
	English language teaching	90	24.00	6.282	Total	18628.307	546			
	Guidence and counseling	218	24.66	5.696						
	Total	547	24.65	5.841						
Positive Attitude Towards Researchers	Preschool education teaching	151	24.56	4.721	Intergroups	271.831	3	90.610	3.297	.020*
	Turkish language teaching	81	22.53	6.301	Intragroup	14923.573	543	27.484		
	English language teaching	90	23.91	5.282	Total	15195.404	546			
	Guidence and counseling	218	23.25	5.154						
	Total	547	23.63	5.275						

As it is seen in Table 1, the difference between the arithmetic averages of the groups was found significant in the subscale of reluctance to help researchers (F=4.749; p<.05), the subscale of negative attitude towards research (F=10.637; p<.05), the subscale of positive attitude towards research (F=3.486; p<.05) and the subscale of positive attitude towards researchers (F=3.297; p<.05).

Complementary analyses were initialized following this result. The homogeneity of the variances was checked first when determining which comparison analysis to use. It was found out that the variance is not homogenous in the subscale of negative attitude towards research (LF=4.245;p<.05) and thus the Tamhane's analysis was applied. As for the subscale of reluctance to help researchers (LF=.023;p>.05), the subscale of positive attitude towards research (LF=,385;p>.05) and the subscale of positive attitude towards researchers (LF=1.842;p>.05) the variance was found to be homogeneous and hence the Scheffe's analysis was applied. The comparative results of the Tamhane's and Scheffe's analyses are tabulated below.

Table 1.1. Tamhane's T2 and Scheffe's Tests carried out in order to determine between which groups the scores taken from the subscales vary by the field of study

Test	Subscales	Field of study	Field of study	Mean difference	Sandart Error	p
Scheffe	Reluctance to help researchers	Preschool education teaching	Turkish language teaching	-3.650	.974	.003*
			English language teaching	-1.627	.941	.394
			Guidance and psk.counseling	-1,320	.744	.370
		Turkish language teaching	Preschool education teaching	3.650	.974	.003*
			English language teaching	2.023	1.091	.330
			Guidance and psk.counseling	2.330	.927	.098
		English language teaching	Preschool education teaching	1.627	.941	.394
			Turkish language teaching	-2.023	1.091	.330
			Guidance and psk.counseling.	.307	.892	.990
		Guidance and psk. counseling	Preschool education teaching	1.320	.744	.370
			Turkish language teaching	-2.330	.927	,098
			English language teaching	-.307	.892	.990

Table 1.1. Continued

Test	Subscales	Field of study	Field of study	Mean difference	Sandart Error	p
Tamhane's T2	Negative Attitude Towards Research	Preschool education teaching	Turkish language teaching	-5.252	1.123	.000*
			English language teaching	-3.275	.907	.002*
			Guidance and psk. counseling	-1.562	.714	.164
		Turkish language teaching	Preschool education teaching	5.252	1.123	.000*
			English language teaching	2.978	1.234	.507
			Guidance and psk.counseling	3.691	1.100	.006*
		English language teaching	Preschool education teaching	3.275	.907	.002*
			Turkish language teaching	-1.978	1.234	.507
			Guidance and psk.counseling	1.713	.878	.278
		Guidance and psk. counseling	Preschool education teaching	1.562	.714	.164
			Turkish language teaching	-3.691	1.100	.006*
			English language teaching	-1.713	.878	.278
Scheffe	Positive Attitude Towards Research	Preschool education teaching	Turkish language teaching	2.369	.793	.031*
			English language teaching	1.690	.766	.183
			Guidance and psk.counseling	1.029	.606	.411
		Turkish language teaching	Preschool education teaching	-2.369	.793	.031*
			English language teaching	-.679	.889	.900
			Guidance and psk.counseling	-1.340	.755	.370
		English language teaching	Preschool education teaching	-1.690	.766	.183
			Turkish language teaching	.679	.889	.900
			Guidance and psk.counseling	-.661	.727	.843
		Guidance and psk. counseling	Preschool education teaching	-1.029	.606	.411
			Turkish language teaching	1.340	.755	.370
			English language teaching	.661	.727	.843
Scheffe	Positive Attitude Towards Researchers	Preschool education teaching	Turkish language teaching	2.026	.716	.047*
			English language teaching	.646	.692	.833
			Guidance and psk.counseling	1.305	.548	.130
		Turkish language teaching	Preschool education teaching	-2.026	.716	.047*
			English language teaching	-1.380	.803	.399
			Guidance and psk.counseling	-.721	.682	.773
		English language teaching	Preschool education teaching	-.646	.692	.833
			Turkish language teaching	1.380	.803	.399
			Guidance and psk.counseling	.659	.657	.800
		Guidance and psk. counseling	Preschool education teaching	-1.305	.548	.130
			Turkish language teaching	.721	.682	.773
			English language teaching	-.659	.657	.800

As it is seen from table 1.1, it was determined that the difference in question in the sub-scale of the reluctance to help research took place between the preschool teacher candidates and Turkish language teacher candidates, in favour of Turkish language teacher candidates at p<.05 level. It was determined that the difference in question in the sub-scale of the negative attitude towards research took place between the preschool teacher candidates and Turkish language teacher candidates, in favour of Turkish language teacher candidates at p<.05 level; between the preschool teacher candidates and English language teacher candidates, in favour of English language teacher candidates at p<.05 level; between the Turkish language teacher candidates and guidence and psychological counselor candidates, in favour of Turkish language teacher candidates at p<.05 level. It was determined that the difference in question in the sub-scale of the positive attitude towards research took place between the preschool teacher candidates and Turkish language teacher candidates, in favour of the preschool teacher candidates at p<.05 level. It was determined that the difference in question in the sub-scale of the positive attitude towards researchers took place between the preschool teacher candidates and Turkish language teacher candidates, in favour of the preschool teacher candidates at p<.05 level. The differences between the arithmetic means of other groups were not found to be significant (p>.05).

Findings on the Second Sub-objective

The second sub-objective of the study is to determine whether teacher candidates' attitudes towards scientific research vary by age. Below, there are findings on the second sub-objective in the form of a table.

Table 2. Kruskal Wallis-H Test carried out in order to determine whether the sub-scale scores of the Scale of Attitude towards Scientific Research of teacher candidates vary by age.

Sub-scales	**age**	**N**	**Mean rank**	**df**	**X²**	**P**
Reluctance to help researchers	18-20	196	277.36			
	21-22	248	276.57			
	23-25	76	271.14	4	3.041	.551
	26-30	18	211.22			
	31 +	8	280.75			
	Total	546				
Negative Attitude Towards Research	18-20	196	280.98			
	21-22	248	273.67			
	23-25	76	262.45	4	2.985	.560
	26-30	18	222.75			
	31 +	8	304.13			
	Total	546				
Positive Attitude Towards Research	18-20	196	277.41			
	21-22	248	269.27			
	23-25	76	264.64	4	2.001	.736
	26-30	18	314.56			
	31 +	8	300.63			
	Total	546				
Positive Attitude Towards Researchers	18-20	196	278.63			
	21-22	248	270.51			
	23-25	76	266.36	4	1.623	.805
	26-30	18	305.22			
	31 +	8	237.19			
	Total	546				

Upon examining table 2, it is seen that no statistically significant difference was found between the sub-scores of the reluctance to help researchers (X^2=3.041; p>.05), negative attitude towards research (X^2=2.895; p>.05), positive attitude towards research (X^2=2.001; p>.05), positive attitude towards researchers (X^2=1.623; p>.05) of teacher candidates.

Findings on the Third Sub-objective

The third sub-objective of the study is to determine whether teacher candidates' attitudes towards scientific research vary by gender. Below, there are findings on the third sub-objective in the form of a table.

Table 3. Independent group t-test carried out in order to determine whether the sub-scale scores of the Scale of Attitude towards Scientific Research of teacher candidates vary by gender

Sub-scales	gender	N	$\bar{X}$	Standart deviation	Standart error mean	T Test		
						t	df	p
Reluctance to help researchers	female	457	21.90	7.111	.332			
	male	87	24.01	7.276	.780	-2.491	119.299	.014*
Negative Attitude Towards Research	female	457	20.90	7.250	.339			
	male	87	24.49	7.798	.836	-3.987	116.038	.000*
Positive Attitude Towards Research	female	457	24.77	5.654	.264			
	male	87	24.06	6.762	.725	1.049	542	.295
Positive Attitude Towards Researchers	female	457	23.98	5.148	.241			
	male	87	21.89	5.654	.606	3.417	542	.001*

Upon examining Table 3, it is seen that no statistically significant difference was found between the arithmetic means of the subscale of Positive Attitude Towards Research (t=1.049; p>.05).

As for the subscale of reluctance to help researchers, the difference between the arithmetic means of the groups was found to be statistically significant (t=-2.491; p<.05). Upon examining the means in order to determine in favour of which group the difference is, it is seen that the arithmetic mean of the males ($\bar{X}$=24.01) is higher than the arithmetic

mean of the females ($\bar{X}$=21.90). In other words, the difference in question is in favour of the males.

As for the subscale of negative attitudes towards research, the difference between the arithmetic means of the groups was found to be statistically significant (t=-3.987; p<.05). Upon examining the means in order to determine in favour of which group the difference is, it is seen that the arithmetic mean of the males ($\bar{X}$=24.49) is higher than the arithmetic mean of the females ($\bar{X}$=20.90). In other words, the difference in question is in favour of the males.

As for the subscale of positive attitudes towards researchers, the difference between the arithmetic means of the groups was found to be statistically significant (t=3.417; p<.05). Upon examining the means in order to determine in favour of which group the difference is, it is seen that the arithmetic mean of the females ($\bar{X}$=23.98) is higher than the arithmetic mean of the males ($\bar{X}$=21.89). In other words, the difference in question is in favour of the females.

Findings on the Fourth Sub-objective

The fourth sub-objective of the study is to determine whether teacher candidates' attitudes towards scientific research vary by grade level Below, there are findings on the fourth sub-objective in the form of a table.

Table 4. One-Way Variance Analysis (ANOVA) performed in order to determine whether the sub-scale scores of the Scale of Attitude towards Scientific Research vary by grade level

		f **.** $\bar{X}$ **and** ***ss*** **Values**			**ANOVA**					
Olcek alt boyutlari	**Group**	**N**	$\bar{X}$	**sd**	**Source of the Variance**	*Sum of Squares*	*df*	*Mean Square*	*F*	*P*
Reluctance to help researchers	1.grade	149	23.12	6.794	**Intergroups**	294.583	3	98.194	1.904	.128
	2.grade	152	22.18	7.178		280054.665	543	51.571		
	3.grade	138	22.40	7.506	**Intragroup**	28349.248	546			
	4.grade	108	20.97	7.279						
	Total	547	22.25	7.199	**Total**					
Negative Attitude Towards Research	1.grade	149	22.55	8.032	**Intergroups**	481.522	3	160.507	2.935	.033*
	2.grade	152	21.92	7.690		29694.533	543	54.686		
	3.grade	138	20.95	6.865	**Intragroup**	30176.055	546			
	4.grade	108	19.98	6.671						
	Total	547	21.46	7.434	**Total**					
Positive Attitude Towards Research	1.grade	149	24.97	6.018	**Intergroups**	89.922	3	29.974	.878	.452
	2.grade	152	24.53	5.968		18538.386	543	34.141		
	3.grade	138	24.07	5.661	**Intragroup**	18628.307	546			
	4.grade	108	25.13	5.645						
	Total	547	24.65	5.841	**Total**					
Positive Attitude Towards Researchers	1.grade	149	23.91	5.418	**Intergroups**	100.791	3	33.597	1.209	.306
	2.grade	152	24.11	5.492		15094.613	543	27.799		
	3.grade	138	23.23	5.035	**Intragroup**	15195.404	546			
	4.grade	108	23.08	5.044						
	Total	547	23.63	5.275	**Total**					

As it is seen in Table 4, the difference between the arithmetic averages of the groups was found insignificant in the subscale of reluctance to help researchers (F=1.904; p>.05), the subscale of positive attitude towards research (F=.878; p>.05) and the subscale of positive attitude towards researchers (F=.306; p>.05).

The difference between the arithmetic averages of the groups was found significant in the subscale of negative attitude towards research (F=2.935; p<.05). Complementary analyses were initialized following this result. The homogeneity of the variances was checked first when determining which comparison analysis to use. It was found out that the variance is homogenous in the subscale of negative attitude towards research (LF=2.246; p>.05) and thus the Scheffe's analysis was applied. The comparative result of the Scheffe's analyses are tabulated below.

Table 4.1. Scheffe's Tests carried out in order to determine between which groups the scores taken from the subscale of negative attitude towards research vary by grade level

Test	Subscales	Field of study	Field of study	Mean difference	Sandart Error	p
Scheffe	negative attitude towards research	1.grade	2.grade	.937	.974	.734
			3.grade	.722	.941	.867
			4.grade	2.148	.744	.132

Table 4.1. Continued

Test	Subscales	Field of study	Field of study	Mean difference	Sandart Error	p
		2.grade	1.grade	3.650	-.937	.734
			3.grade	2.023	-.214	.996
			4.grade	2.330	1.212	.614
		3.grade	1.grade	1.627	-.722	.867
			2.grade	-2.023	.214	.996
			4.grade	.307	1.426	.494
		4.grade	1.grade	1.320	-2.148	.132
			2.grade	-2.330	-1.212	.614
			3.grade	-.307	-1.426	.494

As it is seen in Table 4.1, the difference between the mean difference of the groups could not be found significant as a result of the Tamhane's T2 and Scheffe's test carried out in order to determine between which groups the scores taken from the sub-dimensions of family guidance in technology use and technology application areas vary by the children's age (*p>.05*).

Findings on the Fifth Sub-objective

The fifth sub-objective of the study is to determine whether teacher candidates' attitudes towards scientific research vary by the state of taking scientific research methods course. Below, there are findings on the fifth sub-objective in the form of a table.

Table 5. Independent group t-test carried out in order to determine whether the sub-scale scores of the Scale of Attitude towards Scientific Research of teacher candidates vary by the state of taking course of scientific research methods

Sub-scales	the state of taking course of scientific research methods	N	$\bar{X}$	Standart deviation	Standart error mean	T Test		
						t	df	P
Reluctance to help researchers	yes	192	21.54	7.539	.543			
	no	355	22.64	6.988	.371	-1.674	369.531	.095
Negative Attitude Towards Research	yes	192	20.24	7.043	.508			
	no	355	22.12	7.566	.402	-2.901	416.324	.004*
Positive Attitude Towards Research	yes	192	24.82	5.895	.425			
	no	355	24.56	5.818	.309	.506	545	.613
Positive Attitude Towards Researchers	yes	192	23.41	5.394	.389			
	no	355	23.75	5.214	.277	-.724	380.438	.469

Upon examining Table 5, it is seen that no statistically significant difference was found between the arithmetic means of the subscale of reluctance to help researchers (t=-1.674; p>.05), the subscale of positive attitudes towards research (t=.506; p>.05), the subscale of positive attitudes towards research (t=-.724; p>.05).

As for the subscale of negative attitudes towards research, the difference between the arithmetic means of the groups was found to be statistically significant (t=-2.901; p<.05). Upon examining the means in order to determine in favour of which group the difference is, it is seen that the arithmetic mean of the teacher candidates who did not take the scientific research methods course ($\bar{X}$=22.12) is higher than the teacher candidates who took the scientific research methods course ($\bar{X}$=20.24). In other words, the difference in question is in favour of the teacher candidates who did not take the scientific research methods course.

Findings on the Sixth Sub-objective

The sixth sub-objective of the study is to determine whether teacher candidates' attitudes towards scientific research vary by academic success average. Below, there are findings on the sixth sub-objective in the form of a table.

Table 6. Kruskal Wallis-H Test carried out in order to determine whether the sub-scale scores of the Scale of Attitude towards Scientific Research of teacher candidates vary by academic success average

Sub-scales	Academic success average	N	Mean rank	df	X^2	p
Reluctance to help researchers	0-1.99	14	228.00			
	2.00-2.99	240	251.31			
	3.00-4.00	235	240.63	2	.901	.637
	Total	489				
Negative Attitude Towards Research	0-1.99	14	265.29			
	2.00-2.99	240	251.20			
	3.00-4.00	235	237.46	2	1.424	.491
	Total	489				
Positive Attitude Towards Research	0-1.99	14	226.25			
	2.00-2.99	240	242.94			
	3.00-4.00	235	248.22	2	.421	.810
	Total	489				
Positive Attitude Towards Researchers	0-1.99	14	214.89			
	2.00-2.99	240	241.92			
	3.00-4.00	235	249.94	2	1.049	.592
	Total	489				

Upon examining table 6, it is seen that no statistically significant difference was found between the sub-scores of the reluctance to help researchers (X^2=.901; p>.05), negative attitude towards research (X^2=1.424; p>.05), positive attitude towards research (X^2=.421; p>.05), positive attitude towards researchers (X^2=1.049; p>.05) of teacher candidates.

Results and Discussion

The results obtained from the study were discussed by comparing them to the findings of other studies carried out on the subject below.

It was determined that there was a significant difference between the attitudes of preschool teacher candidates and teacher candidates in other branches towards scientific research. According to this, the preschool teacher candidates' levels of reluctance to help researchers are lower when compared to Turkish language teacher candidates. The preschool teacher candidates' negative attitudes towards research are lower when compared to Turkish and English language teacher candidates. The preschool teacher candidates' positive attitudes towards research and researchers are higher when compared to Turkish language teacher candidates. The guidance and psychological counselor teacher candidates' negative attitudes towards research are lower when compared to Turkish language teacher candidates. According to the results that Korkmaz, Sahin and Yesil (2011b) achieved in the study he carried out with teacher candidates, the levels of reluctance to help researchers of the psychological counselling and guidance department students and their negative attitudes towards research are lower when compared to students from other departments; negative attitudes towards scientific research of the psychological counselling and guidance department students and primary mathematics department are higher when compared to students from other departments; negative attitudes towards scientific research of the science and classroom teaching students are lower when compared to social studies teaching students; positive attitudes towards researchers of the science and classroom teaching students are higher when compared to social studies teaching students, preschool teaching students and Turkish language teaching students. In the study carried out by Polat (2014), the positive attitude scores of elementary school mathematics teaching students towards researchers turned out to be higher when compared to Turkish language teaching students. Other studies carried out on the subject bear qualities that support this finding as well (Bibi at al., 2012; Yavuz, 2009). Differently from this, studies which discover that the attitudes towards scientific research do not vary by the department come into question (Konokman at al., 2013; Cogaltay, 2016). This difference among the research results may result from the fact that sample/study groups and their characteristics differ from each other.

The teacher candidates' attitudes towards research do not vary by age. Different from that, the teacher candidates' attitudes towards research vary by gender. According to this, the levels of reluctance to help researchers of male teacher candidates are higher when compared to female teacher candidates. Male teacher candidates' negative attitudes towards researches are higher when compared to female teacher candidates. Female teacher candidates' positive attitudes towards researchers are higher when compared to male teacher candidates. As a result of the study carried out by Ilhan, Celik and Aslan (2016), it was discovered that females' positive attitudes towards research are higher than those of males. In the study carried out by Korkmaz, Sahin and Yesil (2011b) the levels of reluctance to help researchers of the male teacher candidates and their negative attitude towards research turned out to be higher than those of the female teacher candidates. As a result of the study carried out by Polat (2016), it was discovered that males' positive attitudes towards research are higher than those of females. Differently from this result, studies discovering that the attitudes towards scientific research do not vary by gender are also encountered (Bicer at al., 2013;

Ata & Yenilmez, 2012; Cakmak at al., 2015; Konokman at al., 2013; Ekiz, 2006; Walker & Cousins, 1994; Jordan & Roland, 1999; Saracaloglu, 2008; Saracaloglu at al., 2005; Winans & Madhavan, 1992; Cogaltay, 2016). Having achieved different results regarding the gender in the studies shows that gender is not a factor that solely determines the attitude towards research.

The teacher candidates' attitudes towards research do not vary by the grade level. While some of the results of the studies carried out on the subject support this finding (Ilhan at al., 2016; Cakmak at al., 2015), some do not (Ata & Yenilmez, 2012; Korkmaz at al., 2011b; Kurt at al., 2011). In the study he carried out, Polat (2014) determined that the attitudes of the 4th-grade teacher candidates towards willingness to help researchers were higher when compared to other grades. In the study he carried out, Bicer, Bozkirli and Er (2013) discovered that 4th-grade Turkish language teacher candidates' attitudes towards scientific research were more negative when compared to other grade levels. This situation can be interpreted as that the courses related to scientific research that students take during their undergraduate education at different grades also affect their attitudes towards scientific research.

The teacher candidates' attitudes towards scientific research vary by whether they have taken the scientific research methods course. According to this, the negative attitudes towards research of the teacher candidates who do not take the course of scientific research methods are higher when compared to the teacher candidates who take the research methods course. There are studies in the literature which discover that taking the research methods course affects the research attitudes positively (Benton at al., 1983; Cooke at al., 1993; Ata & Yenilmez, 2012). Differently from this, studies discovering that taking the research methods course does not create a significant difference in the attitudes toward scientific research come into question as well (Cokluk at al., 2005; Ilhan at al., 2016; Tavsancil, 1995; Winans & Madhavan, 1992; Benton & Jerrolds 1982). This situation can be associated with a difference in the quality of the content of the scientific research methods course that students take and the attitude of instructing staff giving this course towards students. Hence, it was concluded in the studies conducted on the subject that there were problems with the teaching of the scientific research method course (Cetin & Dikici 2014), that teacher candidates acquired data collecting and reporting skills yet they had difficulty in analysing the data (Kart & Gelbal, 2014), that the application manner of the course caused a negative attitude towards scientific research to develop (Ayaydin & Kurtuldu, 2010), that as the success of teacher candidates in the scientific research methods course increased their positive attitudes towards scientific research increased as well (Camuzcu-Asiroglu, 2016).

The teacher candidates' attitudes towards research do not vary by the academic success average. While the result of the study carried out by Ata and Yenilmez (2012) supports this finding, the results achieved in the study carried out by Diri (2007) and Kurt at al.(2011) do not support this finding. This situation may be an indicator of the fact that the level of the academic success and the effort shown are not related to the scientific information and research curiosity.

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