



## **The Relationship between Science Teacher Candidates' Attitudes towards Teaching Profession and Their Self-Efficacy Beliefs towards Teaching Science**

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### **Abstract**

This study was aimed to examine the relationship between pre-service science teachers' attitudes toward the teaching profession, their learning styles, and their self-efficacy beliefs toward teaching science. The sample of the research consisted of 127 teacher candidates studying in the Science Education Department of a state university in the 2020-2021 academic year. The data collection tool in the research was the Science Teaching Self-Efficacy Belief Scale; Kolb Learning Style Inventory III and Attitude towards Teaching Profession Scale were used. The research model is the relational survey model, which is under the general survey model. In the survey method, the aim is to uncover a statement in detail. The analysis of the data was carried out with the SPSS statistical program. In the study, it was determined that pre-service science teachers generally have an assimilating learning style, and their learning styles differ according to their grade levels but not according to their gender. In the study, it was determined that teacher candidates generally have a positive attitude toward the teaching profession and their attitudes differ according to their grade levels but not according to their gender. In the study, it was determined that teacher candidates generally have a positive attitude towards the teaching profession and their attitudes differ according to their grade levels but not according to their gender. In addition, the pre-service science teachers' self-efficacy beliefs in science teaching were at a "sufficient" level; significant differences were found in the sub-dimensions of science self-efficacy, belief in efficacy, and outcome expectation, according to gender and grade levels. In addition, a significant

relationship was found between pre-service teachers' attitudes toward the teaching profession and their learning styles. There is a positive but low-level relationship between pre-service teachers' level of result expectation, which is the science self-efficacy sub-dimension, and their attitudes towards the teaching profession; No significant relationship was found between the level of efficacy belief, which is the sub-dimension of science self-efficacy, and the attitude towards the teaching profession.

**Keywords:** Attitude towards the teaching profession, learning style, self-efficacy belief, science teaching

## A. Introduction

In today's world, where great changes are experienced in science and technology, teachers are in a key position in raising individuals with the knowledge and skills required by age (Recepoğlu & Recepoğlu, 2020). All over the world, progress in the field of education develops the industry, and developments in the industry force education to change (Aslan Efe & Hanas, 2022). In the changing and developing world, the duties and responsibilities of teachers are increasing day by day (Turalı, 2014). Teachers are expected to guide students in their learning processes, that is, to guide their learning (Kahyaoğlu et al., 2013). Teachers lead students in the learning and teaching processes, shape our children, who are our future, influence students in all kinds of behaviors inside and outside the classroom, and become role models for them. It is only possible to have teachers who do their duties fully, who research, who behave positively towards students, who are open to innovations, and who think creatively, only by training teacher candidates who have a positive attitude towards the teaching profession (Eskici, 2019). At the same time, it can be stated that teacher self-efficacy and attitude toward the teaching profession are important factors that directly affect the quality of education in order to raise qualified students (Şahin & Şahin, 2017; Güneşli & Aslan, 2009). Pre-service teachers start their professional lives with the positive and negative beliefs they had before (Feyzioğlu et al., 2014). When the subject of education and teaching is considered, teachers' self-efficacy beliefs play a critical role in teachers' professional lives (Şenler, 2017). According to Woolfolk-Hoy and Spero (2005), investigating pre-service teachers' self-efficacy beliefs towards science teaching is very important in terms of predicting their pedagogical performances in their future professional lives. In recent years, it is extremely important to understand and investigate the relationship between teachers' teaching beliefs and their attitudes toward the profession in order to evaluate and improve the quality of education and training in the world (Eskici, 2019).

Learning styles were first introduced as a concept in the 1960s by Rita Dunn. Although continuous research has been made on it since then, it was only after the 1960s that it entered schools and found an application area (Boydak, 2006). Learning Style According to Kolb (1984), learning includes the sum of human activities: feeling, reflecting, thinking, and doing. It is thought that individuals develop special abilities and preferences

for these activities. These particular preferences are called learning styles. While Keefe (1979) explains learning styles as the source of relatively stable cognitive, affective and psychological behaviors in how people react to learning environments, interact with and perceive learning environments (Keefe, 1979), Curry (2000) perceives against a stimulus situation, memory defined as the individual difference in thinking and judgment (Yamazaki, 2005). This difference, which includes learners' unique learning, is called learning style (Özgen & Alkan, 2014).

Kolb Learning Style Kolb (1984) created the Learning Style Model in Experiential Learning Theory. Experiential Learning Theory, on the other hand, was built on Dewey's experiential learning concept by integrating with other experiential learning theorists Kurt Lewin, William James, Jean Piaget, and Paulo Freire. According to the theory, learning is a process that consists of a combination of experience, cognition, perception, and behavior, in which knowledge is transformed into experiences. Education based on experiential learning theory requires the organization of educational activities suitable for every learning path and therefore every learning style. The learning style model is a combination of four learning abilities. These are the "concrete experiences" on which the feeling learning style is based; "reflective observation" on which learning by watching and listening is based; "abstract conceptualization" on which learning by thinking is based and learning by doing are "active experiences" on which learning style is based. However, while determining learning styles, matter alone does not give a person's dominant learning style. The component of these four elements gives the learning style of each individual. Concrete experience and abstract conceptualization abilities examine the individual's information perception dimension, and reflective observation and active experience abilities examine the individual's information processing dimension. According to Kolb (Kolb & Kolb, 2005), there are four learning styles. These are the transforming style based on reflective observation and concrete experiences, the assimilating style based on reflective observation and abstract conceptualization, the decomposing style based on abstract conceptualization and active life, and the locating style based on active life and concrete life (Atiker et al., 2021; Bakaç, 2022; Mohiuddin, 2021; Ciancarini et al., 2020; Deviana et al., 2019; Daud et al., 2016).

Attitude teachers affect students with their personality in the learning and teaching processes. Therefore, the educational aspects of teachers are closely related to their personalities. Teachers' personality, on the other hand, is their attitudes, behaviors, interests, needs, values, etc. creates personality traits. One of the important personality traits of teachers that affect students is attitude (Küçükahmet, 1976). Cognitive, emotional, and behavioral elements are fully present in well-established, strong attitudes. In some weaker attitudes, especially the behavioral element may be very weak. Attitudes serve several important functions. It defines the individual, manages his/her future feelings and thoughts, and summarizes the individual's feelings, thoughts, goals, and behaviors. Attitudes are learned. This learning is determined by the processes of association, reinforcement, and imitation. Children spend a lot of time with their parents and after a while they begin to believe what they believe by simply copying them. The same process

seems to operate within peer groups, teachers, or any important person in a child's life. Attitudes acquired at an early age are quite stable and do not change easily unless there are significant experiences and events (Bordens & Horowitz, 2002; Kağıtçıbaşı, 1988).

In the context explained above, determining the self-efficacy beliefs of candidate teachers, their attitudes toward teaching, and their learning styles are of great importance for the quality of education. In this context, having a high efficacy belief in science education can increase success and personal satisfaction. Self-efficacy is a person's belief in his ability to solve planned activities. Self-efficacy could be a person's belief in his ability to resolve planned activities. Self-efficacy reflects a person's confidence in their ability to perform tasks creatively and optimistically (Deviana et al., 2019). Students with high and sufficient self-efficacy can be more comfortable and productive when faced with studies with high difficulty levels. Attitude in the teaching profession is the tendency of teachers to show a behavioral activity by using their experience, knowledge, emotion, and experience at the highest level against themselves or all subjects or events in education and training. Learning styles differ from student to student and from subject to subject. For this reason, determining the learning style provides the development of creative thinking, which facilitates learning by both the student and the teacher, and increases self-confidence.

## **B. Literature Review**

Although there are many studies in the literature examining the attitudes of pre-service science teachers towards the teaching profession, no study has been found that investigates the relationship between pre-service science teachers' attitudes towards the teaching profession and their learning styles arising from their individual differences and their self-efficacy beliefs towards teaching science. For this reason, in the study, as a result of examining the relevant literature, it was investigated whether there is a relationship between the attitudes of science teacher candidates toward the teaching profession and their learning styles and self-efficacy beliefs toward science teaching.

According to Hein and Budny (2000), most of the studies on learning styles indicate that learning success increases and students' attitudes develop positively if the teaching environments are designed considering the learning styles of the students (Alkan, 2020). From this point of view, it is thought that this study will contribute to teacher candidates, lecturers, and interested parties.

Studies in the literature examining prospective teachers' attitudes towards the teaching profession (İlter, 2009; Derman, 2007; Dağ, 2010; Açışlı & Kolomuç, 2012; Bayhan, 2009; Demirtaş et al., 2011; Nakip, 2015; Akpınar et al., 2006; Balı, 2015; Camadan & Duysak, 2010; Delen, 2016; Bozdoğan et al., 2007; Aksoy, 2010; Çapri & Çelikkaleli, 2008; Şahin & Şahin, 2017; Gökay, 2020; Gökçe, 2019; Gökçe & Sezer, 2012; Özkan, 2017; Özcan, 2017; Nakip & Özcan, 2016; Pektaş & Kamer, 2011); studies investigating teacher candidates' learning styles (Açışlı, 2016; Yılmaz, 2014; Köse, 2010; Gürsoy, 2008; Güven & Kürüm, 2008; Güçlü, 2020); studies examining the relationship between pre-service teachers' attitudes towards the teaching profession and their learning styles (Baykara

Pehlivan, 2010; Cigdem, 2010); studies examining pre-service science teachers' self-efficacy beliefs towards teaching science (Yılmaz, 2014; Kose, 2010); There are studies (Yılmaz, 2014; Köse, 2010) examining the relationship between pre-service science teachers' learning styles and their self-efficacy beliefs about teaching science.

In this context, the aim of this study is to examine the relationship between pre-service science teachers' attitudes toward the teaching profession and their learning styles and self-efficacy beliefs toward teaching science. For this purpose, answers were sought for the following questions:

1. At what level are science teacher candidates' attitudes towards the teaching profession?
2. Attitudes of prospective science teachers towards the teaching profession; Does it differ according to gender and grade level variables?
3. What is the distribution of learning styles of pre-service science teachers?
4. Learning styles of pre-service science teachers; Does it differ according to gender and grade level variables?
5. What is the level of self-efficacy beliefs of science teacher candidates towards teaching science?
6. Do pre-service science teachers' self-efficacy beliefs towards teaching science differ according to gender and grade level variables?
7. Do pre-service science teachers' attitudes towards the teaching profession change according to their learning styles and self-efficacy beliefs about teaching science?

### **C. Research Methodology**

In this section, the research and its type, the study group, the data collection tools used, and the data analysis process are explained.

#### **1. Research Design**

In this study, the scanning model was used to describe the existing situation. "In the screening model, the event, individual, or object that is the subject of the research is tried to be defined in its own conditions and as it is. No attempt is made to change or influence them in any way." (Karasar, 2005). Since the aim of the study is to evaluate the relationship between the learning styles of science teacher candidates' attitudes towards the teaching profession and their self-efficacy beliefs towards science teaching, the comparison type relational survey method was used in the descriptive survey model in the research. The research model is the relational survey model, which is under the general survey model.

#### **2. Participants of the Study**

The study group consists of pre-service teachers studying at the Science Education Department of a state university. The sample of the study consisted of 127 pre-service teachers studying in the Science Education Department of a state university in the 2020-2021 academic year.

Descriptive statistical methods (number and percentage) were used to evaluate the personal characteristics (gender and grade levels) of prospective science teachers participating in the study and are presented in Table 1.

Table: 1 Demographic Distribution of Teacher Candidates

Gender	Number (N)	Percent (%)
Male	51	40.2
Female	76	59.8
<b>Total</b>	<b>127</b>	<b>100,0</b>
Grade Level	Number (N)	Percent (%)
1 <sup>st</sup> Grade	32	25.2
2 <sup>nd</sup> Grade	24	18.9
3 <sup>rd</sup> Grade	34	26.8
4 <sup>th</sup> Grade	37	29.1
<b>Total</b>	<b>127</b>	<b>100,0</b>

According to the demographic distribution of prospective teachers in Table 1, 51 (40.2%) are male and 76 (59.8%) are female. At grade levels, 32 (25.2%) were 1<sup>st</sup> grade, 24 (18.9%) 2<sup>nd</sup> grade, 34 (26.8%) 3<sup>rd</sup> grade, and 37 (29.1%) 4<sup>th</sup> grade.

### 3. Instruments

In this study, data were collected through "Science Teaching Self-Efficacy Belief Scale", "Learning Styles Scale" and "Attitude towards Teaching Profession Scale" and personal characteristics determining questionnaire. These scales are briefly discussed below.

**Science Teaching Self-Efficacy Belief Scale:** Science Teaching Self-Efficacy Belief Scale is a 5-point Likert-type scale consisting of 23 matters developed by Riggs & Enochs (1990). The scale consists of two independent sub-dimensions. These are "Efficacy Belief" and "Outcome Expectation". The science teaching self-efficacy belief scale of primary school teacher candidates was adapted into Turkish by Bıkmaz (2002). The scale adapted to Turkish consists of 21 matters. According to the results of the factor analysis, the adapted scale has two factors, just like the original scale, but the number of matters in the scale has decreased to 21. There are 13 matters, 5 of which are positive and 8 of which are negative, in the factor named Self-Efficacy Belief in Science Teaching, and there are 8 matters in total, 7 of which are positive and 1 of which are negative, in the factor named "Outcome Expectation" in science teaching. The scale is a 5-point Likert type and has the degrees of strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1).

**Kolb Learning Style Inventory:** "Kolb Learning Style Inventory III", which was developed by David Kolb in 1971 and translated into Turkish by Gencil (2006) and whose validity and reliability studies were conducted, was used to determine the learning styles of the pre-service teachers participating in the research. In this learning style inventory prepared by Kolb, it is determined where individuals are in the learning cycle (Aşkar &

Akkoyunlu, 1993). Kolb Learning Style Inventory III consists of 12 complementary matters. Matters in the inventory are scored between one and four. Accordingly, the lowest score that can be obtained from the scale is 12, and the highest score is 48. Each matter in the scale corresponds to a learning path: concrete experience, concrete conceptualization, reflective observation, and active experience. After scoring the learning paths in the scale matters, the combined scores are calculated. Combined scores are calculated as Active Experience (A.E.)-Reflective Observation (R.O.) and Abstract Conceptualization (A.C.)-Concrete Experience (C.E). If the scores obtained from A.C.-C.E. are negative, the learning is concrete; If it is positive, it indicates that it is abstract. A.E.-R.O. The scores obtained from the process indicate that the learning is active or reflective. The results obtained from the combined scores range from (-36) to (+36). The learning path that represents each learning style is different from the other. For example; learning by "feeling" for concrete experience, "watching, listening" for reflective observation, "thinking" for abstract conceptualization and "doing" for active living. Each individual's learning style is a component of these four basic learning styles. These learning styles are the components of concrete experience and reflective observation learning styles, which are "converger", reflective observation and abstract conceptualization forms, "assimilator", abstract conceptualization and active experience learning styles, "diverger", concrete experience and active experience learning styles, which is the "accommodator" learning style (Demir, 2008).

**Attitude Scale towards Teaching Profession:** The 34-matter, 5-point Likert-type and one-dimensional scale developed by Üstüner (2006) were prepared to determine the attitudes of teacher candidates towards the teaching profession. The 5-point Likert-type scale consists of 24 positive, 10 negative, 34 matters in total. The scale is one-dimensional. The matter rating system was organized as "(1) strongly disagree, (2) partially agree, (3) moderately agree, (4) mostly agree, (5) completely agree". The highest score that can be obtained from the scale is 170 points. Positive matters in the scale; Matters 1, 3, 4, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 29, 31, 33, 34. Negative matters in the scale; Matters 2, 5, 6, 7, 8, 15, 20, 21, 30, 32. The criterion validity of the scale was .89; its reliability was found to be .72 and the internal consistency coefficient to be .93.

#### **4. Data Analysis Techniques**

The data obtained from the results of the data collection tool used in the research were analyzed through the SPSS 22 program. Statistical methods (Mean, Number and Percentage) were used to explain the distribution of science self-efficacy and teaching profession attitude scale matters and learning styles. While evaluating the study data, the conformity of the parameters to the normal distribution was evaluated with the Kolmogorov-Smirnov test. In a comparison of parameters showing normal distribution in quantitative data, ANOVA and Independent Two-Sample t-test; Kruskal Wallis and Mann Whitney U tests were used in the comparison of parameters that did not show normal distribution. In order to determine the relationship between the variables, Spearman's Correlation analysis was applied to the variables that did not show normal distribution (one

of them showed normal distribution), and Chi-Square analysis was applied to determine the relationship between the groups.

#### D. Findings

The estimation obtained by reaching this long route is considered as a sub-model. Presentation by examining under separate headings.

##### 1. Findings Concerning the Attitudes of Teacher Candidates towards Teaching Profession

The results of the distribution of the matters applied to the pre-service teachers of the Attitude Scale towards the Teaching Profession are presented in Table 2.

Table: 2 The Distribution of the Matters of the Attitudes of the Teacher Candidates towards the Teaching Profession

Matter	Never Agree		Disagree		I'm undecided		Agree		Absolutely Agree		Average
	f	%	f	%	f	%	f	%	f	%	
Matter 1	2	1,6	6	4,7	14	11	38	29,9	67	52,8	4,276
Matter 2	88	69,3	23	18,1	10	7,9	1	0,8	5	3,9	1,519
Matter 3	3	2,4	7	5,5	14	11	22	17,3	81	63,8	4,346
Matter 4	22	17,3	16	12,6	28	22	18	14,2	43	33,9	3,346
Matter 5	92	72,4	17	13,4	16	12,6	1	0,8	1	0,8	1,441
Matter 6	85	66,9	19	15	16	12,6	2	1,6	5	3,9	1,606
Matter 7	97	76,4	17	13,4	6	4,7	1	0,8	6	4,7	1,441
Matter 8	104	81,9	9	7,1	4	3,1	3	2,4	7	5,5	1,425
Matter 9	3	1,4	2	1,6	17	13,4	32	25,2	73	57,5	4,339
Matter 10	9	7,1	15	11,8	19	15	23	18,1	61	48	3,882
Matter 11	2	1,6	7	5,5	20	15,7	38	29,9	60	47,2	4,127
Matter 12	3	2,4	17	13,4	19	15	26	20,5	62	48,8	4
Matter 13	3	2,4	7	5,5	20	15,7	36	28,3	61	48	4,142
Matter 14	4	3,1	19	15	35	27,6	19	15	50	39,6	3,724
Matter 15	103	81,1	11	8,7	2	1,6	5	3,9	6	4,7	1,425
Matter 16	3	2,4	10	7,9	26	20,5	38	29,9	50	39,4	3,961
Matter 17	1	0,8	5	3,9	31	24,4	37	29,1	53	41,7	4,071
Matter 18	2	1,6	3	2,4	7	5,5	28	22	87	68,5	4,535
Matter 19	3	2,4	7	5,5	22	17,3	38	29,9	57	44,9	4,094
Matter 20	94	74	21	16,5	7	5,5	2	1,6	3	2,4	1,417
Matter 21	79	62,2	20	15,7	16	12,6	1	0,8	11	8,7	1,779
Matter 22	3	2,4	8	6,3	28	22	30	23,6	58	45,7	4,039
Matter 23	11	8,7	5	3,9	34	26,8	35	20,5	51	40,2	3,795
Matter 24	3	2,4	2	1,6	27	21,3	29	22,8	66	52	4,205
Matter 25	-	-	10	7,9	21	16,5	32	25,2	64	50,4	4,181
Matter 26	3	2,4	12	9,4	44	34,6	25	19,7	43	33,9	3,732
Matter 27	2	1,6	8	6,3	27	21,3	39	30,7	51	40,2	4,016
Matter 28	1	0,8	2	1,6	27	21,3	35	27,6	62	48,8	4,220



*The Relationship between Science Teacher Candidates' Attitudes*

Matter 29	5	3,9	13	10,2	17	13,4	30	23,6	62	48,8	4,031
Matter 30	60	47,2	30	23,6	22	17,3	13	10,2	2	1,6	1,953
Matter 31	-	-	4	3,1	30	23,6	26	20,5	67	52,8	4,229
Matter 32	77	60,6	14	11	16	12,6	12	9,4	8	6,3	1,898
Matter 33	3	2,4	18	14,2	21	16,5	26	20,5	59	46,5	3,945
Matter 34	7	5,5	7	5,5	13	10,2	28	22	72	56,7	4,189

In Table 2, the matter "Matter 18: The thought of teaching people something they do not know makes me happy" has the highest average score ( $\bar{x}=4.535$ ) according to the distribution of attitudes of prospective teachers towards the teaching profession. To this matter, 87 people (68.5%) answered "Absolutely agree ". The second highest average score ( $\bar{x}=4.346$ ) is "Matter 3: I attribute being a teacher to myself." is the matter. To this matter, 81 people (63.8%) answered "Absolutely agree". The third highest average score ( $\bar{x}=4.339$ ) is "Matter 9: I believe I will be successful in teaching." is the matter. To this matter, 73 people (57.5%) answered "Absolutely agree".

The Results of Pre-service Teachers' Attitudes toward the Teaching Profession are presented in Table 3.

Table: 3 Results on Attitudes of Teacher Candidates towards Teaching Profession

	Minimum	Maximum	Average	Standard Deviation
Attitude towards the Teaching Profession	1,82	5	4,163	0,6308

According to Table 3, the average score of the answers given by the pre-service teachers regarding their attitudes toward the teaching profession varies between 1.82 and 5 points, with an average of  $4.163 \pm 0.6308$  points.

Mann Whitney U Test Results Regarding Attitudes towards Teaching Profession by Gender Variable are presented in Table 4.

Table: 4 Mann Whitney U Tests on Attitudes towards Teaching Profession by Gender Variable

Scale	Gender	N	X row	$\Sigma$ row	U	z	p
Attitude towards the Teaching Profession	Male	51	58.36	2976.50	1650.5	-1.415	.157
	Female	76	67.78	5151.50			

According to Table 4, there is no significant difference in the attitudes of teacher candidates towards the teaching profession according to the gender variable ( $p= .157 > .05$ ;  $U=1650.5$ ). Accordingly, it is seen that the scores of science teacher candidates for the teaching profession do not differ according to gender.

The Kruskal Wallis Test Results Regarding Attitudes Towards the Teaching Profession by Grade Levels are presented in Table 5.

Table: 5 Kruskal Wallis Test on Attitudes Towards Teaching Profession by Grade Levels

Scale	Grade	N	$\bar{x}_{sıra}$	$X^2$	Sd	p	Difference
Attitude towards the Teaching Profession	1 <sup>st</sup> Grade	32	74.88	11.187	3	.011*	1>2*
	2 <sup>nd</sup> Grade	24	50.21				1>4*
	3 <sup>rd</sup> Grade	34	73.96				3>2*
	4 <sup>th</sup> Grade	37	54.39				3>4*

\*p<.05

According to Table 5, there is a significant difference in the attitudes of prospective teachers toward the teaching profession according to their grade levels ( $x^2$  (sd=3, n=127)=11.187; p<.05). According to the results of Mann Whitney-U test performed to determine the difference between the groups, 1<sup>st</sup> grade ( $\bar{x}_{row}$ =74.88) and 3<sup>rd</sup> grade ( $\bar{x}_{row}$ =73.96), 2<sup>nd</sup> grade ( $\bar{x}_{row}$ =50.21) and 4<sup>th</sup> grade ( $\bar{x}_{row}$ =54.39) has a more positive attitude than the teaching profession.

## 2. Findings Regarding the Learning Styles of Pre-Service Teachers

The results regarding the Distribution of the Learning Styles of the Candidate Teachers are presented in Table 6.

Table: 6 Distributions of Teacher Candidates' Learning Styles

Learning style	f	%
Accommodator	32	25.2
Converger	18	14.2
Diverger	26	20.5
Assimilator	51	40.2
<b>Total</b>	<b>127</b>	<b>100</b>

According to Table 6, 40.2% of the pre-service teachers had an assimilator learning style; 25.2% of them have an accommodator learning style; It is seen that 20.5% have a diverger learning style and 14.2% have a converger learning style.

Evaluation in Table 7 according to the Chi-Square Test Results of the Learning Styles of the Teacher Candidates According to the Variable of their Gender.

Table: 7 Chi-Square Test Results on Learning Styles by Gender Variable

Gender	Learning Style				Total	
	Accommodator	Converger	Diverger	Assimilator		
Male	N	9	4	13	25	51
	%	17.6	7.8	25.5	49	100
Female	N	23	14	13	26	76
	%	30.3	18.4	17.1	34.2	100
Total	N	32	18	26	51	127
	%	25.2	14.2	20.5	40.2	100

$X^2=7.052$  sd=3 p= .07

According to Table 7, there is no significant relationship between teacher candidates' learning styles according to gender ( $X^2=7,052, p> .05$ ). It is seen that, after the assimilator style (49%), the males have the diverger (25.5%), accommodator (17.6%) and converger (7.8%) learning styles, respectively. On the other hand, it is seen that women have accommodator (30.3%), converger (18.4%), and diverger (17.1%) learning styles, respectively, after the assimilator style (34.2%). According to the results, female and male candidates preferred more assimilator and accommodator learning styles; On the other hand, it is seen that there are more female candidates who prefer the assimilator learning style, the ratio of male and female teacher candidates who prefer the diverge learning style is very close, and the accommodator and converger learning styles are mostly preferred by the female candidates.

The Chi-Square Test Results Regarding the Learning Styles of the Teacher Candidates by Grade Level are presented in Table 8.

Table: 8 Chi-Square Test Results on Learning Styles by Grade Levels

Grade Level	Learning Style				Total	
	Accommodator	Converger	Diverger	Assimilator		
1 <sup>st</sup> Grade	N	14	8	4	6	32
	%	43.8	25	12.5	18.8	100
2 <sup>nd</sup> Grade	N	12	2	5	5	24
	%	50	8,3	20.8	20.8	100
3 <sup>rd</sup> Grade	N	5	6	6	17	34
	%	14.7	17.6	17.6	50	100
4 <sup>th</sup> Grade	N	1	2	11	23	37
	%	2.7	5.4	29.7	62.2	100
Total	N	32	18	26	51	127
	%	25.2	14.2	20.5	40.2	100

$X^2=38.509, sd=9, p= .000$

According to Table 8, it is seen that there is a significant relationship between teacher candidates' grade levels and learning styles ( $X^2=38.509, p<.05$ ). After the accommodator (43.8%) learning style in the 1<sup>st</sup> grades, it is seen that they have converger (25%), assimilator (18.8%) and diverger (12.5%) learning styles, respectively. In the 2<sup>nd</sup> grades, after the accommodator style (50%), it is seen that they have the diverger (20.8%) and assimilator (20.8%), and converger (8.3%) learning styles, respectively. After the assimilator (50%) learning style in the 3<sup>rd</sup> grades, it is seen that they have the accommodator (17.6%) and converger (17.6%) and accommodator (14.7%) learning styles, respectively. It is seen that after the assimilator (62.2%) learning style in the 4<sup>th</sup> grades, they have the diverger (29.7%), converger (5.4%), and accommodator (2.7%) learning styles, respectively.

### 3. Findings Related to the Distribution of Pre-service Teachers' Self-Efficacy Beliefs for Teaching Science

The results of the Distribution of the Self-Efficacy Belief Matters of the Pre-service Teachers for Teaching Science are presented in Table 9.

Table: 9 Distribution of Pre-service Teachers' Self-Efficacy Beliefs for Teaching Science

Matter	Never Agree		Disagree		I'm undecided		Agree		Absolutely Agree		Average
	f	%	f	%	f	%	f	%	f	%	
Matter 1	-	-	-	-	5	3.9	44	34.6	78	61.4	4.575
Matter 2	74	58.3	48	37.8	1	0.8	-	-	4	3.1	1.520
Matter 3	-	-	-	-	5	3.9	59	46.5	63	49.6	4.457
Matter 4	-	-	-	-	10	7.9	58	45.7	59	46.5	4.386
Matter 5	68	53.5	46	36.2	6	4.7	6	4.7	1	0.8	1.630
Matter 6	5	3.9	5	3.9	20	15.7	53	41.7	44	34.6	3.992
Matter 7	75	59.1	48	37.8	2	1.6	2	1.6	-	-	1.457
Matter 8	-	-	-	-	4	3.1	55	43.3	68	53.5	4.504
Matter 9	36	28.3	47	37	25	19.7	17	13.4	2	1.6	2.228
Matter 10	37	29.1	29	22.8	21	16.5	29	22.8	11	8.7	2.591
Matter 11	-	-	2	1.6	6	4.7	51	40.2	68	53.5	4.457
Matter 12	3	2.4	13	10.2	17	13.4	51	40.2	43	33.9	3.929
Matter 13	-	-	-	-	7	5.5	59	46.5	61	48	4.425
Matter 14	-	-	2	1.6	6	4.7	56	44.1	63	49.6	4.417
Matter 15	58	45.7	51	40.2	15	11.8	3	2.4	-	-	1.709
Matter 16	-	-	1	0.8	8	6.3	60	47.2	58	45.7	4.378
Matter 17	2	1.6	7	5.5	14	11	54	42.5	50	39.4	4.126
Matter 18	49	38.6	45	35.4	23	18.1	8	6.3	2	1.6	1.969
Matter 19	74	58.3	48	37.8	3	2.4	2	1.6	-	-	1.472
Matter 20	-	-	-	-	4	3.1	50	39.4	73	57.5	4.543
Matter 21	62	48.8	54	42.5	8	6.3	2	1.6	1	0.8	1.63

In Table 9, the ones with the highest average score ( $\bar{x}=4.575$ ) according to the self-efficacy belief distributions of the pre-service teachers for teaching science "Matter 1: I will constantly find better teaching ways for science lesson." is the matter. To this matter, 78 people (61.4%) answered "Absolutely agree". The second highest average score ( $\bar{x}=4.543$ ) is "Matter 20: I will generally welcome students' questions when teaching science." is the matter. To this matter, 73 people (57.5%) answered "Absolutely agree". The third highest average score ( $\bar{x}=4.504$ ) is "Matter 8: The deficiencies of a student with a weak foundation in science can be eliminated with good teaching." is the matter. To this matter, 68 people (53.5%) answered "Absolutely agree".

The results of the distribution of the pre-service teachers' Self-Efficacy Beliefs for Learning Science and sub-dimension scores are presented in Table 10.

Table: 10 Distribution of Self-Efficacy Beliefs and Sub-Dimension Scores for Learning Science

Sizes	Minimum	Maximum	Average	Standard Deviation
Efficiency Belief	2.91	5	4.303	0.4216
Expectation of Results	3.25	5	4.434	0.4279

According to Table 10, the mean score of the pre-service teachers' responses to the efficacy belief scale, one of the sub-dimensions of science teaching self-efficacy, ranges between 2.91 and 5 points, with an average of  $4.303 \pm 0.4216$  points. The mean score of their responses to the outcome expectation scale, which is one of the sub-dimensions of science teaching self-efficacy belief, ranges from 3.25 to 5 points, with a mean score of  $4.434 \pm 0.4279$ .

The Independent t-Test Results on Science Self-Efficacy of Pre-service Teachers by Gender Variable are presented in Table 11.

Table: 11 Independent t-Test Results of Science Self-Efficacy by Gender Variable

Sizes	Gender	N	X	Ss	t	sd	p
Efficiency Belief	Male	51	4.422	4.05376	2.642	125	.009*
	Female	76	4.222	4.92989			
Expectation of Results	Male	51	4.586	2.94272	3.464	125	.001*
	Female	76	4.332	3.41586			

\* $p < .05$

According to Table 11, efficacy belief ( $t(125)=2.642$ ;  $p < .05$ ) and outcome expectation dimensions ( $t(125)=3.464$ ;  $p < .05$ ), which are sub-dimensions of pre-service science teachers' science self-efficacy, are significant according to gender. there is a difference. When the mean values are taken into account, it is seen that the self-efficacy scores of men ( $\bar{x}=4.422$ ) and outcome expectation ( $\bar{x}=4.586$ ) are higher than that of women.

ANOVA Test Results on Science Self-Efficacy of Pre-Service Teachers According to Grade Levels are presented in Table 12.

Table: 12 ANOVA Test on Science Self-Efficacy of Pre-Service Teachers by Grade Levels

Sizes		$x^2$	Sd	Average Squared	F	p	Difference Between Groups
Efficiency Belief	In groups	1038.3	3	346.093	24.27	.000*	3>1*
	Intergroup	1753.8	123	14.259			3>2*
Expectation of Results	Intergroup	167.05	3	55.684	5.407	.002*	4>1*
	In groups	1266.6	123	10.298			4>2*

\* $p < .05$

According to Table 12, prospective teachers' science self-efficacy sub-dimensions ( $F(3,123)=24.27$ ;  $p<.05$ ) and result from expectation ( $F(3,123)=5.407$ ;  $p<.05$ ) there is a significant difference. As a result of the Tukey Multiple Comparison Test, it is seen that the differentiation in both dimensions of self-efficacy perception is between 1<sup>st</sup> and 2<sup>nd</sup> grades and 3<sup>rd</sup> and 4<sup>th</sup> grades. Considering the average values, it was determined that the 3<sup>rd</sup> grade ( $\bar{x}=4.484$ ) and 4<sup>th</sup> grade ( $\bar{x}=4.570$ ) science teacher candidates were the 1<sup>st</sup> grade ( $\bar{x}=4.071$ ) and 2<sup>nd</sup> grade ( $\bar{x}=3.943$ ) science teacher candidates. According to the candidates, it can be said that efficacy beliefs are higher. When the average values of the outcome expectation dimension are examined, it is seen that the 3<sup>rd</sup> grade ( $\bar{x}=4.540$ ) and 4<sup>th</sup> grade ( $\bar{x}=4.578$ ) science teacher candidates are 1<sup>st</sup> grade ( $\bar{x}=4.297$ ) and 2<sup>nd</sup> grade ( $\bar{x}=4.245$ ). It is seen that the result expectation is higher than the science teacher candidates.

The Kruskal Wallis Test Results for the Relationship Between Attitudes Towards the Teaching Profession and Learning Styles are presented in Table 13.

Table: 13 Kruskal Wallis Test Results Regarding the Relationship between Attitudes towards Teaching Profession and Learning Styles

Scale	Learning Style	N	$\bar{x}_{sıra}$	$X^2$	sd	p
Attitude Towards Profession	Accommodator	32	72.25	3.042	3	.385
	Converger	18	54.83			
	Assimilator	26	59.96			
	Diverger	51	64.12			

According to Table 13, there is no significant difference in the attitudes of prospective teachers toward the teaching profession according to their learning styles ( $\chi^2(sd=3, n=127)=3.042$ ;  $p>.05$ ). According to this, it is seen that there is no difference in the attitudes of science teacher candidates towards the profession according to their learning styles.

The Spearman's Correlation Test Results for the Relationship Between Attitudes Towards the Teaching Profession and Science Self-Efficacy are presented in Table 14.

Table: 14 Spearman's Correlation Test Results for the Relationship between Attitudes towards Teaching Profession and Science Self-Efficacy

Science Self-Efficacy Dimensions	Teaching Profession Attitude	
	rho	p
Belief in Efficiency	0.14	.872
Expectation of Results	0.170	.042*

\* $p<.05$

According to Table 14, there is a significant positive correlation between prospective teachers' level of result expectation, which is the science self-efficacy sub-dimension, and their attitudes towards the teaching profession ( $\rho=0.17$ ,  $p<.05$ ). However, this relationship appears to be at a low level. There was no significant

relationship between the level of belief in efficacy, which is a sub-dimension of science self-efficacy, and the attitude towards the teaching profession ( $\rho=0.14$ ,  $p>.05$ ).

## **E. Discussion and Conclusion**

When the results of the personal characteristics of the pre-service science teachers participating in the research are examined, it is seen that the majority of the participants are female candidates when the gender distribution of the participants is taken into account. Such studies in the world and in our country show that female students prefer the teaching profession more, as in our research. Considering the grade levels, it can be said that the number of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> grade students is equally distributed, but the 4<sup>th</sup> grade students are the most. The benefit of having more of these students shows that the closest students to starting the profession will contribute more positively to the research.

In this study, which aims to examine the relationship between pre-service science teachers' attitudes toward the teaching profession, their learning styles, and their self-efficacy beliefs toward teaching science, it has been determined that the attitudes of pre-service teachers toward the teaching profession are generally positive. This result is in parallel with the research results in the literature (İlter, 2009; Baykara Pehlivan, 2010; Çiğdem, 2010; Gökçe, 2019; Akpınar et al., 2006; Özkan, 2017). The most prominent teacher characteristics that affect their students the most are teacher attitudes. Teachers' positive attitudes towards their profession are very important for their students' personality development and their effective, productive, and permanent learning by reflecting positively on their behaviors in the classroom environment. In this context, it is very important to determine the attitudes of science teacher candidates before they start their professional life and to determine their attitudes in general in this study.

Another result of the research is that there is no significant difference in the attitudes of teacher candidates towards the teaching profession according to the gender variable. This result is in line with some research results in the literature (Bayhan, 2009; Demirtaş et al., 2011; Açışlı & Kolomuç, 2012; Nakip, 2015; Gökay, 2020; Gökçe, 2019; Özkan, 2017; Özcan, 2017; Nakip et al. Özcan, 2016) shows parallelism. In many studies in the literature, it has been found that female teacher candidates have higher attitudes toward the teaching profession than males (İlter, 2009; Akpınar et al., 2006; Baykara Pehlivan, 2010; Dağ, 2010; Balı, 2015; Camadan & Duysak, 2010; Aksoy, 2010; Çiğdem, 2010; Delen, 2016; Bozdoğan et al., 2007; Gökçe & Sezer, 2012; Çapri & Çelikkaleli, 2008; Şahin & Şahin, 2017; Pektaş & Kamer, 2011). He states that from an early age, cultures consider some occupations primarily for women and some for men. Attitudes and behaviors that will affect professional interests are determined at a very early age through identification and learning. Accordingly, it can be said that the teaching profession is seen as a female profession, that it can be effective in the formation of attitudes, and that results supporting this general judgment have been reached, but despite the high number of female participants in this study, no significant difference was found in their attitudes towards the teaching profession.

As a result of the research, there is a significant difference in the attitudes of teacher candidates towards the teaching profession according to their grade levels. As a result of the analyzes made, among the first-year students and second and fourth-year students in favor of the first class; A significant difference was found between the third-year students and the second and fourth-year students in favor of the third year. When the class averages are examined, it has been determined that the first-grade students have higher attitudes towards the teaching profession compared to the students at other grade levels. This result shows parallelism with the results of studies in the literature (Pektaş & Kamer, 2011; Güdek, 2007). Balı (2015) found in his study that the attitudes of pre-service teachers studying in the 3<sup>rd</sup> grade towards the teaching profession are lower than those of other classes. Akpınar et al., (2006) found a significant difference only between 1<sup>st</sup> and 3<sup>rd</sup> grade science teacher candidates in favor of 3<sup>rd</sup> grades. This result contradicts the research results in the literature (Açışlı & Kolomuç, 2012; Çiğdem, 2010; Şahin & Şahin, 2017). Gökçe and Sezer (2012) found in their study that the attitudes of teacher candidates towards the teaching profession do not change according to the grade level. Özkan (2017) found a difference between the 2<sup>nd</sup> grade and 4<sup>th</sup> grade teacher candidates as a result of his study in which he examined the attitudes of pre-service science teachers towards the teaching profession and determined that this difference was in favor of the 4<sup>th</sup> grade.

From the analysis of the data obtained from the research, the teacher candidates generally have the highest assimilating learning style; the learning style that places it later; again, it was determined that they had a converging learning style and the least divergent learning style. In this context, it was determined that pre-service teachers generally have an assimilating learning style. Some studies in the literature support this result (Güven & Kürüm, 2008; Gürsoy, 2008). In this context, pre-service teachers mostly preferred to use sequential, detailed, and planned information, which is one of the characteristics of the assimilation learning style; They are successful in having inquisitive and intuitive power, pursuing goals and opportunities, adapting to new situations and thinking concretely, which are the characteristics of the placement learning style; It can be said that they are weak in problem-solving, decision making, making logical analysis, making systematic planning, which are the characteristics of the converging learning style, and in the subjects of good summarization and good synthesis, being social, being open-minded, which are the characteristics of the diversion learning style. Baykara Pehlivan (2010) found in his study that pre-service teachers have the most divergent learning style and the least divergent learning style. Çiğdem (2010) found in her study that primary school teacher candidates have the most divergent and assimilating learning styles.

In the study, no significant difference was found in the learning styles of the teacher candidates according to the gender variable. However, nearly half of the male teacher candidates participating in the research have an assimilating learning style, and half of the remaining students have a converging, less than that accommodating, and at least a changing learning style; On the other hand, it was determined that one-third of the female teacher candidates had an assimilating, nearly one-third of them accommodating, half of the remaining students had a changer and the other half had a converging learning style.



According to the results, it was seen that male and female teacher candidates preferred the assimilating learning style more. In other words, it can be said that the reflective observation and abstract conceptualization abilities of male and female teacher candidates are dominant. In the study of Çiğdem (2010), female teacher candidates have the most assimilating learning style; on the other hand, the most changing learning style of male teacher candidates; In Gürsoy (2008), the most assimilating learning style of teacher candidates; Köse (2010) and Fettahlioğlu (2008) stated that pre-service science teachers generally have a converging learning style.

As a result of the research, a significant difference was found between the pre-service teachers' grade levels and their dominant learning styles. Nearly half of the 1<sup>st</sup> grade teacher candidates are the placers; changers of half of the placer; it is seen that half of the changers, that is, at least, the teacher candidates have assimilating learning styles in a group close to the changer. Half of the pre-service teachers studying in the 2<sup>nd</sup> grade; at least changing; It is seen that almost half of the placers have converging learning styles, and the other half of the placers and a portion equal to the dissociative have assimilative learning styles. In this context, it has been determined that the majority of the 2<sup>nd</sup> year students, like the 1<sup>st</sup> year students, have an accommodating learning style. In this context, it can be said that 1<sup>st</sup> and 2<sup>nd</sup> grade students are individuals whose concrete and active living skills are dominant, who like to plan, can communicate easily, and who prefer to learn by doing and living. At least part of the pre-service teachers studying in the 3<sup>rd</sup> grade; is close to the placer, but a little too much changer; again, it is seen that the part that is close to the setter, but very little of it, but equal to the changer, has discriminative learning styles, and half of them and at most the majority have assimilative learning styles. Placing the least or even the minimum level of teacher candidates studying in the 4<sup>th</sup> grade; again very close to this but changing a lot of it; It is seen that nearly one-third of them have converging learning styles and more than half of them have assimilating learning styles. In this context, it has been determined that the majority of the 4<sup>th</sup> grade students, like the 3<sup>rd</sup> grade students, have an assimilating learning style. From this point of view, it can be said that 4<sup>th</sup> grade students, like 3<sup>rd</sup> grade students, are individuals whose abstract conceptualization and reflective observation skills are dominant, and they prefer to observe, read while learning, and analyze analytical examples. Gürsoy (2008) and Köse (2010) found in their study that the learning styles of teacher candidates do not differ according to their gender.

In the study, a significant difference was found in the efficacy belief and outcome expectation sub-dimensions of science self-efficacy according to the gender variable of pre-service teachers. There is a significant gender difference in the dimensions of efficacy belief and outcome expectation, which are sub-dimensions of pre-service science teachers' self-efficacy. Considering the average values, it is seen that the self-efficacy scores of men's efficacy belief and outcome expectation are higher than that of women. While this result shows parallelism with some research results in the literature (Demirtaş et al., 2011; Morgil et al., 2004), it also shows some research results (Nakip, 2015; Şahin & Şahin, 2017; Fettahlioğlu, 2008) contradicts. Yılmaz (2014) did not find a significant difference between

the gender of pre-service teachers, their self-efficacy beliefs towards science teaching, and their outcome expectation. Köse (2010) determined that female teacher candidates' self-efficacy belief levels were higher than male teacher candidates.

In the study, it was determined that the efficacy beliefs of the 3<sup>rd</sup> and 4<sup>th</sup> grade teacher candidates were higher than the 1<sup>st</sup> and 2<sup>nd</sup> grade teacher candidates in the efficacy belief and outcome expectation sub-dimensions of the science self-efficacy beliefs of the prospective teachers according to their grade levels. In this context, it can be said that with the increase in the number of education and field courses as the grade level increases, the teacher candidates' self-confidence in effective science teaching increases. Şenler (2017) 2<sup>nd</sup> grade science teacher candidates have the highest self-efficacy belief; It was determined that the 1<sup>st</sup> grade teacher candidates had the lowest self-efficacy beliefs and that the self-efficacy beliefs of the teacher candidates decreased in the classes after the 2<sup>nd</sup> grade. Köse (2010) determined that 1<sup>st</sup> grade science teacher candidates had the highest average scores in the general science self-efficacy scale and personal self-efficacy sub-dimensions, and 2<sup>nd</sup> grade teacher candidates had the highest score averages in the outcome expectation sub-dimension. Gürsoy (2008) determined that learning styles differed significantly with the grade level variable. Pre-service teachers attending the 1<sup>st</sup> grade, assimilator; On the other hand, it has been revealed that pre-service teachers attending the 4<sup>th</sup> grade have a diverger learning style.

As a result of the study, no significant relationship was found between the attitudes of teacher candidates toward the teaching profession according to their learning styles. This result shows parallelism with the result of Baykara Pehlivan (2010) study. Çiğdem (2010) stated in her study that pre-service teachers with a diverger learning styles have a much more positive attitude toward the teaching profession.

As a result of the study, a positive and significant relationship was observed between the teacher candidates' level of result expectation, which is the science self-efficacy sub-dimension, and the attitude towards the teaching profession. This result shows parallelism with some research results in the literature (Demirtaş et al., 2011; Nakip, 2015; Çapri & Çelikkaleli, 2008; Şahin & Şahin, 2017). Similarly, in Demir Yıldız (2018) study, of music teacher candidates; Derman (2007) found that chemistry teacher candidates; found a high level of relationship between self-efficacy beliefs and attitudes towards the profession. Demirtaş et al. (2011) found a low positive correlation between pre-service teachers' self-efficacy perceptions and their attitudes toward the profession. Nakip (2015) found a significant and moderate relationship between the professional self-efficacy level of physical education teacher candidates and their attitudes toward the teaching profession. In the study of Demircioğlu and Işık (2020), while university students' self-efficacy perceptions differed significantly in terms of academic averages and upbringing styles, they did not differ significantly in terms of grade level variables. Yüner (2020) It has been determined that there is a positive relationship between teacher self-efficacy beliefs and intrinsic academic motivation, extrinsic academic motivation levels and academic performance achievement.

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These students are related to their attitudes toward the teaching profession, people towards learning, and the use of science. Candidates about the selection of science teacher candidates for research, selection of candidates who have a lot of preferences about teaching in the world and about practice.

Since it was determined that teacher candidates' attitudes towards the teaching profession were positive; When teacher candidates start their profession, they will be the teachers who affect their students the most. Determining the attitudes that they will show towards the profession and students before starting their professional life has also revealed an important fact for prospective teachers to continue their future professional lives. Despite the high number of female teacher candidates according to the gender variable, both groups' attitudes toward the teaching profession and their positive perspectives on the profession are similar. It has been observed that the professional values and positive attitudes of the teacher candidates towards the teaching profession when they start the first grade are higher while they are still candidates, without learning the professional knowledge and the subtleties of the profession, and this rate starts to decrease in the following years.

Regardless of whether the teacher candidates are male or female, the learning styles characteristics; Sequential, detailed, planned, curious, having intuitive power, pursuing goals and opportunities, adapting to new situations, successful in concrete thinking, more challenging and complex problem solving, decision making, logical analysis, systematic planning, good It was observed that they were weak in the subjects of summarizing and synthesizing well, being social, being open-minded. In addition, as their grade progresses, pre-service teachers are individuals whose abstract conceptualization and reflective observation abilities are dominant, and they prefer to observe, read while

learning, and examine analytical examples. It was seen that men's efficacy belief and outcome expectation self-efficacy beliefs were higher than women's.

It is predicted that pre-service teachers with high self-efficacy beliefs will be more willing and successful in teaching science-related subjects, willingly making the necessary planning and the requirements of their profession, in their professional life. Since pre-service teachers dedicate themselves to their profession, lessons and students, and as a result, they can become the most popular teachers, they are able to enjoy teaching and learning, provide a positive classroom atmosphere, use different teaching methods and techniques, communicate accurately and effectively with their students, and trust themselves and their students. Most importantly, they will be pre-service teachers with high self-efficacy. Students who are or will be trained by science teachers with these characteristics will want to have characteristics like them and will take them as role models, and they will grow up as students with high self-efficacy in learning and teaching processes.

## F. Suggestions

This study was applied to 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> grade students of pre-service science teachers. However, it is considered that it would be appropriate to apply this study in all grades of all other department students in the Faculty of Education. Because in this study, it was aimed to examine the relationship between the attitudes of science teacher candidates towards the teaching profession and their learning styles and self-efficacy beliefs towards science teaching, and the results for the application of the prospective teachers before they started their profession were determined and important clues were provided. If this study were applied to all teacher candidates studying in the Faculty of Education, important and significant information about the whole would be collected.

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