ISSN:2630-6212
SOCIAL SCIENCE DEVELOPMENT JOURNAL
SSDjournal
Open Access Refereed E-Journal & Refereed & Indexed
http://www.ssdjournal.org / journalssd@gmail.com
Article Arrival Date: 02.09.2021 Published Date: 15.09.2021
Doi Number : http://dx.doi.org/10.31567/ssd.498
Vol 6 / Issue 27 / pp: 284-302

SINIF ÖĞRETMENİ ADAYLARININ MATEMATİK ÖĞRENMEYE İLİŞKİN İNANÇ DÜZEYLERİ VE PROBLEM ÇÖZMEYE İLİŞKİN İNANÇ DÜZEYLERİ ARASINDAKİ İLİŞKİNİN İNCELENMESİ

INVESTIGATION OF THE RELATIONSHIP BETWEEN THE BELIEF LEVELS OF THE PROSPECTIVE TEACHERS ON LEARNING MATHEMATICS AND THEIR BELIEFS ON PROBLEM SOLVING

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ÖZET
Matematik, bireyin hayata uyumunu destekleyen hayatın içinde, akıl yürütme yoluyla zihnimizde oluşan düşünme yöntemi ve bir bilim dalıdır. Sadece sayılar, formüller, işlemler ve belirli kurallardan oluşan bir disiplin olmayıp aynı zamanda günlük hayatımızda çeşitli problemleri çözmemizi sağlar. Bu anlamda eğitimin önemli parçalarından biri olan ve öğrenciler üzerinde çok etkili olan sınıf öğretmenlerinin matematiğe bakış açıları, almış oldukları matematik eğitimleri, matematik öğrenmeye olan inançları ve problem çözme becerileri oldukça önemlidir. Bu çalışmada, sınıf öğretmeni adaylarının matematik öğrenme inançları ile matematik problemlerini çözme inançları arasındaki ilişki durumu incelenmiştir. Çalışmada nicel araştırma yöntemlerinden ilişkisel tarama modeli kullanılmıştır. Çalışmaya 216'sı kadın 88'i erkek olmak üzere toplam 305 sınıf öğretmeni adayı katılmıştır. Veri toplama aracı olarak daha önceden geliştirilmiş olan Belief to Learn Mathematics ve Belief to Solve Mathematical Problems ölçekleri kullanılmıştır. Çalışma sonucunda, sınıf öğretmeni adaylarının matematik öğrenmeye yönelik inanç ölçeğine verdikleri yanıtlar ile matematiksel problem çözme inancı ölçeğine verdikleri yanıtlar arasında pozitif yönlü fakat çok zayıf ilişki olduğu sonucu çıkmıştır. Bu sonuca neden olan etmenlerin neler olduğu diğer araştırmaların konusu olarak önerilebilir.
Anahtar Kelimeler: Sınıf öğretmeni adayları, matematik öğrenmeye ilişkin inanç, problem çözme

Social Science Development Journal 2021 September Volume: 6 Issue: 27 pp: 284-302
Doi Number : http://dx.doi.org/10.31567/ssd.498

ABSTRACT
Mathematics is a method of thinking and a science that is formed in our minds through reasoning in life that supports the adaptation of the individual to life. It is not only a discipline consisting of numbers, formulas, operations and certain rules, but also allows us to solve various problems in our daily life. In this sense, the perspectives of primary school teachers, who are one of the important parts of education and are very effective on students, about mathematics, their mathematics education, their belief in learning mathematics and their problem solving skills are very important. In this study, the relationship between primary school prospective teachers' beliefs in learning mathematics and their beliefs in solving mathematical problems was examined. Relational survey model, one of the quantitative research methods, was used in the study. A total of 305 classroom prospective teachers, 216 of whom were female and 88 were male, participated in the study. The previously developed Belief to Learn Mathematics and Belief to Solve Mathematical Problems scales were used as data collection tools. As a result of the study, it was concluded that there was a positive but very weak relationship between the answers given by the primary school prospective teachers to the scale of belief in learning mathematics and their answers to the belief in mathematical problem solving. The factors that cause this result can be suggested as the subject of other studies.
Keywords: Primary school prospective teachers, belief in learning mathematics, problem solving

INTRODUCTION

Mathematics is a science branch in life that supports the adaptation of individuals to life (Kurtuluş & Eryılmaz, 2017). Defining mathematics as a science branch consisting of a series of mathematical operations founded by a group of people would be inaccurate. Because mathematics is a thinking method that happens in our minds via reasoning (Ünveren Bilgiç, 2018). Mathematics is a field that supports us to observe our environment in our daily lives to understand and develop. It is not just a discipline consisting of numbers, formulas, operations and certain rules but at the same time, it enables us to solve various problems in our daily lives (Karakılıç & Arslan, 2019).

Mathematics has always been an intrinsically challenging field to perceive and understand. The reason for this can be suggested as mathematics being abstract and a product of the human mind. Mathematics challenging students' perception and understanding is due to the abstract property of this field. Concretizing mathematics is necessary to overcome this challenge(Çeker & Ev Çimen, 2017).

From the first day of creation, humankind continues to understand and solve the problems experienced in their daily life(Kanbolat & Balta, 2019). A problem is a situation that might cause an individual to struggle with challenges to confuse that individual when this individual is moving towards an objective. In short, a situation can be a problem when individuals need to struggle by facing certain challenges and use the existing knowledge to understand the situation (Ünveren Bilgiç, 2018). In other words, a situation can be a problem if this situation disturbs an individual and the individual is conscious about what this disturbance is. In terms of mathematics, a problem can mean interesting and attractive questions without previous knowledge about the solution and revealed with the previous knowledge (Toptaş & Gözel, 2017). Problems are the result and movement of defining mathematical language and concepts and different mathematical activity areas in various multidisciplinary studies. When the studies are investigated, there are multiple classifications and views regarding problems in mathematics (Aşıcı & Dede, 2019). People experience multiple problems in their daily lives and they attempt to solve these problematic situations by using skills learned in the school with problem-solving processes. Therefore, individuals need to learn problem-solving skills and continuously develop these skills (Eryılmaz Toksoy & Akdeniz, 2017). A problem can be a situation that individuals work to solve not just in

mathematics but also in our daily lives. Thus, individuals need to gain problem-solving skills to cope with the problem situation (Tetik & Yazgan, 2018).

One of the main purposes of mathematics teaching is to enable individuals to gain problem-solving skills (Yıldız & Ev Çimen, 2017). In other words, the main purpose of mathematics teaching is to raise individuals with free and researcher spirit and advanced critical and creative thinking skills to create plans for solutions by generally understanding the problem situations and reach results by applying these developed plans (Deringöl, 2019). A problem in which the individuals can develop a solution strategy with reasoning and benefit from information about mathematics can be used as a learning tool. Problem-solving is considered an important part of the whole in mathematics and acts as the main element in mathematics teaching (Okay & İncikabı, 2019). Problem-solving is considered an important element to understand, comprehend and apply mathematics. As seen from here, problem-solving is a process to experience certain skills and knowledge in the mathematics field (Boz, 2018). Problem-solving is assessed as an important discipline that transfers the nature of mathematics. To generalize, problem-solving is a process that can be argued to be complex. In this process of problem-solving, the individual analyses the previous knowledge and uses this knowledge to find a solution to a new situation (Serin & Korkmaz, 2018). From this perspective, since problem-solving is referred to as solving complex situations, it should be argued that problem-solving is about solving a problem rather than solving a question. Because problem-solving solves complex situations as well as making them clear and understandable. Problem-solving skill is one of the fundamental elements to form mathematics as a discipline as well as related disciplines. While it has interpretation and understands skills, it also has skills to apply four operations. Students gain high-level learning skills by acquiring these skills (Boz, 2018). Problem-solving skill is important to enabling individuals to develop their skills to easily intervene to a problem and to increase the solution method options to solve a problem (Kalaycı & Hürriyetoğlu, 2018).

The applications towards problem-solving which is considered to be the basis of mathematics should include applications that are similar to real life. As the problem-solving applications are related to real life, the individual's skills will develop in line with these similarities. Because an individual will be more successful as that individual can associate the problem situation with real-life (Boz, 2018). Since selecting problems from real life will create familiar situations for the individuals, they will also act as motivators (Usta & Mirasyedioğlu, 2017). In our country, understanding, using and applying mathematics in daily life gained more value. In this sense, transferring knowledge and skills to daily life problems and also transferring to learning fields is highlighted as one of the main purposes of mathematical education in elementary school (Çilingir Altıner & Artut, 2017).

In curriculum, problem-solving is not introduced by being defined as a single subject but planned to cover the entire education process. With these methods, the main aim is to develop the reasoning and thinking skills of the individuals by using their minds and enabling them to understand, apprehend and explain the mathematics subjects systematically (Doğan & Çetin, 2018).

Preparing individuals for life is one of the main objectives of education. Related to this subject, the aim is to enable individuals to gain strong and effective problem-solving skills throughout the mandatory processes of their education life against problem situations as well as learning how to act in different situations. Individuals with problem-solving skills are expected to find useful and quick solutions to problems they will face in their life and adapt to any new situation they will experience. The reason for that is the thought that the individuals will be successful to solve problems they experience and live a healthy life. Individuals need to have skills to solve problems with acceptable methods to live a happy and successful life (Bal İncebacak & Ersoy, 2018).

Since problem-solving is a skill that we commonly use in various fields of daily life, education for problem-solving should be well-organized and contribution to an individual's mathematical thinking should be provided. Thus, the thing to contribute to mathematical thinking in the problem-

solving stage is the knowledge and relationships acquired at the solution stage (Özyıldırım Gümüş & Umay, 2017).

In today's world, individuals experience new problems that the previous generations did not experience due to technological advancements and developments. This situation causes us to need individuals who actively use mathematics, value the field of mathematics and most importantly have strong mathematical thinking (Yıldız & Ev Çimen, 2017). This need has led to one of the purposes of mathematics teaching which is helping individuals to develop their mathematical thinking skills (Toptaş & Gözel, 2017). In mathematics education, individuals need to gain certain mathematical competencies in addition to arithmetic skills. One of these competencies is mathematical thinking (Temel & Altun, 2020). Today, individuals need to gain mathematical thinking skills to manage their own problem situations, develop suitable solution systems for these problems and create mathematical connections in daily life (Genç & Karataş, 2017).

Mathematics has an undeniable effect to enrich the power of thinking. Therefore, mathematics education is one of the fundamental elements in the academic period. The term mathematical thinking emerges accordingly. In this age, the development of human societies is ensured by individuals who find a solution to problem situations by making associations between the experiences situations throughout lifelong learning. Individuals consciously or unconsciously benefit from mathematics and mathematical thinking in every stage of their lie. This reveals that mathematical thinking is not only used by individuals interested in mathematics but also is a thinking method benefited by all individuals throughout their lives. While mathematical thinking is among the fundamental purposes of mathematics education, it has the most important position in mathematics education since it is commonly used in the real-life problem-solving process. Mathematical thinking elements can be explained and defined as mathematical activities by individuals, appropriately using information, adopting a mathematical perspective and effectively using problem-solving strategies. The development of mathematical thinking can be ensured by carefully providing problem solutions, adapting existing knowledge and experience, forming a relationship with the existing knowledge and application, organizing activities in the problem-solving process and understanding the connection between mathematics and real life. Thus, mathematical thinking can be enriched by investigating and evaluating the different aspects of the problem instead of focusing on the answer to the problem. When it is considered that mathematical thinking contributes to apprehending existing thoughts, finding the relationships between these thoughts and explaining the basis supported by these relationships, developing the mathematical thinking of individuals and assessing according to this situation will start to gain importance (Kükey & Aslaner & Tutak, 2019).

Since understanding the mathematical information and creating a connection between them occurs within the problem-solving process, individuals learn how to use certain mathematical skills with the development of problem-solving skills and acquire mathematical thinking skills. Individuals who acquired mathematical thinking skills can distinguish structures and systems in their daily lives and other fields and be more active and successful to learn scientific processes. Mathematical thinking skills influence the lives of all humans regardless of being an individual with special needs or an individual with normal development (Kot & Yıkmış, 2018).

In the economic conditions of our age, the states need to advance in the science and technology field to stand strong. This situation is explained by the need to raise individuals with innovative and entrepreneurial characteristics for science and technology fields. (Öner & Özdem Yılmaz, 2019). Such that, one of the purposes of education is to enable raising knowledgeable individuals who can develop solutions for possible problems in the future and use their skills against these problem situations (Memnun & Kanbur, 2020).

Problem-solving has an important position in mathematics teaching and education and the majority of the activities expressed in this field are related to problem-solving. Raising students who can understand, solve and assess the solutions of the mathematical problems which adapts the real-life

problems is among the purposes of mathematics education. Teachers receive education accordingly to match the problem-solving approach and to actively use these skills in mathematics education. As a result, teachers should be able to realize and live that they can learn mathematics by solving problems during their university education under mathematics ad mathematics learning subjects. Analysing teachers' views about problem-solving has gained importance with the increased value of problem-solving in mathematics education. The individual's belief level in mathematics can influence the problem-solving processes and learning processes. At the same time, teachers' teaching experience can be influenced by their beliefs towards learning and teaching. Teachers' beliefs towards mathematics are important since these beliefs contribute to teaching mathematics in the most suitable way (Deringöl, 2018).

Teachers are the main elements of teaching and education. When the impact area in the education system in our country is considered, teachers' duties are significant. Such that, voluntary teachers who care about self-development and have knowledge and skills required by society are always needed. One of the purposes of modern education is to ensure raising individuals with high mathematical capacity and belief level and advanced mathematical thinking skills. Therefore, the teachers should have pedagogic field knowledge in our age for an education that will bring success. With that, teachers' are expected to be self-confident, sincere individuals open to innovations and interested in technology with problem-solving skills and creative intelligence. Prospective teachers should be able to create problem-solving strategies to manage the possible new problems, blend them with their own perspective and acquire mathematical thinking skills. Prospective teachers with this education will educate their students in the same way (Toptaş & Gözel, 2017). It is important for teachers who will be the architects of the future generations to live and learn with experience the problem-solving stages in mathematical efforts in their departments (Ünveren Bilgiç, 2018).

The importance of fundamental education in acquiring problem-solving skills is undeniable and the classroom teachers who are responsible for this process have an important duty on their shoulders. At the same time, when it is considered that elementary school students in concrete operations period have different cognitive developments than secondary school and high school students, the classroom teachers' duties gain more importance. Therefore, prospective classroom teachers' activities regarding problem-solving skills will enable the prospective teacher to gain knowledge towards competencies and to contribute to those individuals to complete the shortcomings of their competencies (Yılmaz, 2018).

In this study, the relationship between Pre-service Classroom Teachers' Beliefs in Learning Mathematics and Beliefs in Solving Mathematics Problems was examined. For this purpose, it has been tried to reach the answers to the following questions.

1. What is the belief level of primary school prospective teachers towards learning mathematics?
2. Is there a significant difference according to the variables of gender, grade level and type of school graduated from primary school prospective teachers for learning mathematics?
3. What is the belief level of primary school prospective teachers towards mathematical problem solving?
4. Is there a significant difference in terms of gender, grade level and type of school graduated from primary school prospective teachers for mathematical problem solving?
5. Is there a relationship between Primary School Prospective teachers' answers to the Mathematical Learning Beliefs Scale and the Mathematical Problem Solving Beliefs Scale?

METHOD

In this study, the correlational model was used to examine the relationship between the Belief to Learn Mathematics and Belief to Mathematical Problem-Solving of Prospective Primary School Teachers. In these studies, data are collected to determine certain characteristics of a group and the relationship between two or more variables is tried to be determined (Büyüköztürk et al., 2012).

Study Group

Table1. Characteristics of Participant Prospective Primary School Teachers

Characteristics of Participant Teachers	f	%
Gender		
Female	216	71.1
Male	88	28.9
Total	304	100
Grade Level		
1. Grade	58	19.1
2. Grade	77	25.3
3. Grade	88	28.9
4. Grade	81	26.6
Total	304	100
Graduated High School Type		
Anatolian High School	164	53.9
Religious Vocational High School	32	10.5
Vocational and Technical High School	11	3.6
Multi-Program High School	10	3.3
Anatolian Teaching High School	16	5.3
MABEK	17	5.6
Basic High School	25	8.2
Science High School	3	1.0
Open Education High School	2	0.7
Social Science High School	14	4.6
Health Vocational High School	7	2.3
Private High School	3	1.0
Total	304	100

Data Analysis

The previously developed scales for the study were applied by the researchers online to prospective primary school teachers and data was collected. SPSS package program was used in the statistical analysis of the data.

In this study, the data obtained from the scales applied to prospective primary school teachers were analysed and the Cronbach's Alpha reliability coefficient was calculated as 0.79. It is stated that the scale was highly reliable when the reliability coefficient is larger than 0.70 (Büyüköztürk et al., 2016). Since the calculated value was larger than this value, it is possible to state that the scales are highly reliable.

The normality distribution of the scales applied to 304 prospective primary school teachers was conducted with Kolmogorov Smirnov and Shapiro-Wilk tests. Shapiro-Wilk test is used when the number of data is smaller than 30 and the Kolmogorov-Smirnov test is used when the number of data is larger than 30 (Kalaycı et al., 2008). Since the number of data was 304 for this study, Kolmogorov-Smirnov (Lilliefors) test result was investigated and since this value was higher than 0.05, this showed that the data complied with normal distribution. The normality values for the applied scale are given in Table 1.

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Doi Number : http://dx.doi.org/10.31567/ssd.498

Table 2. Normality Values of Applied Scale

	Kolmogorov-Smirnov[a]			Kolmogorov-Smirnov[a]		
	Statistics	df	Sig	Statistics	df	Sig
Belief to Learn Mathematics	0.84	304	0.058	0.986	304	0.068
Belief to Solve Mathematical Problems	0.63	304	0.063	0.982	304	0.031

a. Lilliefors Significance Correction

The obtained data showed normal distribution. Since p>0.05 for the Kolmogorov-Smirnov normality test, it could be stated that the obtained data showed normal distribution. Additionally, since the skewness and kurtosis values were between -0.247 and 1.358, the data can be assumed to have a normal distribution. According to Tabachnick and Fidell (2013), the obtained data shows normal distribution when the skewness and kurtosis values are between -1.5 and +1.5.

FINDINGS

The data obtained from the study group was analysed and presented in tables. The answers to the Belief to Learn Mathematics Scale was given in the Table below.

Table 3. Prospective Primary School Teachers' Percentage-Frequency Table to Answers to Belief to Learn Mathematics Scale

Negative Attitudes	N %	Completely Disagree	Disagree	Indecisive	Agree	Completely Agree
M1. Learning mathematic require knowing about subject-related rules, formula and procedures.	N	43	141	41	67	12
	%	14.1	46.4	13.5	22.0	3.9
M2. In learning mathematics, the main source of information must be the teacher.	N	23	97	51	110	23
	%	7.6	31.9	16.8	36.2	7.6
M3. The most effective way to learn mathematics is to do a lot of exercises.	N	114	142	33	12	3
	%	37.5	46.7	10.9	3.9	1.0
M4. The most important indicator that a student learned mathematics is whether the student found the right results for the related problem.	N	36	117	53	82	16
	%	11.8	38.5	17.4	27.0	5.3
M5. Each student can discover and create their own mathematical knowledge.	N	5	55	83	122	39
	%	1.6	18.1	27.3	40.1	12.8

M6. Discussing students' mistakes is an effective way to learn mathematics.	N	11	27	35	165	66
	%	3.6	8.9	11.5	54.3	21.7
M7. Learning mathematics requires understanding the logic of mathematical knowledge and rules.	N	3	13	18	178	92
	%	1.0	4.3	5.9	58.6	30.3
M8. Students learn mathematics from their friends as much as they learn from their teachers.	N	4	13	21	175	91
	%	1.3	4.3	6.9	57.6	29.9
M9. Students' logic during the problem-solving process is more important than finding the right result for the problem.	N	4	9	29	165	97
	%	1.3	3.0	9.5	54.3	31.9
M10. Regardless of what is done in mathematics, there will always be some students who do not understand mathematics.	N	26	90	75	86	27
	%	8.6	29.6	24.7	28.3	8.9

The table including the prospective primary school teachers' answers to the Belief in Mathematical Problem-Solving Scale is given below.

Table 4. Prospective Primary School Teachers' Percentage-Frequency Table to Answers to Belief to Mathematical Problem-Solving Scale

Negative Attitudes	**N %**	**Completely Disagree**	**Disagree**	**Indecisive**	**Agree**	**Completely Agree**
1. The mathematical problems that take a long time to solve makes me uncomfortable.	N	27	75	59	93	50
	%	8.9	24.7	19.4	30.6	16.4
2. I believe I can solve mathematical problems that will take a long time to solve.	N	5	23	80	149	47
	%	1.6	7.6	26.3	49.0	15.5
3. If I work on it, I can solve hard mathematical problems.	N	2	10	46	157	89
	%	0.7	3.3	15.1	51.6	29.3

4. If I can't solve a mathematical problem in a few minutes, I probably cannot solve it at all.	**N**	85	151	39	25	4
	%	28.0	49.7	12.8	8.2	1.3
5. If I can't solve a mathematical problem fast, I will quit trying.	**N**	105	157	25	16	1
	%	34.5	51.6	8.2	5.3	0.3
6. I am not good at mathematical problems that take a long time to solve.	**N**	36	108	71	78	11
	%	11.8	35.5	23.4	25.7	3.6
7. some problems cannot be solved by following the predetermined methods.	**N**	8	36	86	153	21
	%	2.6	11.8	28.3	50.3	6.9
8. The problems can be solved without memorising a formula.	**N**	7	27	65	156	49
	%	2.3	8.9	21.4	51.3	16.1
9. Memorising solution methods is not beneficial to learn problem-solving.	**N**	11	62	75	105	51
	%	3.6	20.4	24.7	34.5	16.8
10. Any problem is solvable if you know how to follow the right method.	**N**	6	16	31	191	60
	%	2.0	5.3	10.2	62.8	19.7
11. Most of the problems can be solved by applying step-by-step solution methods.	**N**	3	12	19	196	74
	%	1.0	3.9	6.3	64.5	24.3
12. Learning to solve the problems is mostly related to memorising and applying the right method.	**N**	35	117	65	80	7
	%	11.5	38.5	21.4	26.3	2.3
13. Time spend to research whey a solution to a mathematical problem is correct is time well spent.	**N**	2	18	44	169	71
	%	0.7	5.9	14.5	55.6	23.4

14. An individual who does not understand why a solution to a mathematical problem is right has not yet really solved that problem.	**N**	4	12	38	171	79
	%	1.3	3.9	12.5	56.3	26.0
15. In mathematics, it is important to understand why an answer is right as much as finding the right answer.	**N**	6	10	17	137	134
	%	2.0	3.3	5.6	45.1	44.1
16. It is not important to understand what does a mathematical operation do as long as it gets the right answer.	**N**	8	29	31	124	112
	%	2.8	9.5	10.2	40.8	36.8
17. In mathematics, it is more important to find the right answer than to understand why an answer is right.	**N**	87	125	36	45	11
	%	28.6	41.1	11.8	14.8	3.6
18. If the right answer can be found, it is not important whether you understand a mathematical problem.	**N**	5	21	24	126	128
	%	1.6	6.9	7.9	41.4	42.1
19. An individual who cannot solve a problem cannot understand mathematics.	**N**	44	130	78	64	15
	%	14.5	33.9	25.7	21.1	4.9
20. If an individual does not use his/her operational skills in problem-solving, these skills have low value.	**N**	11	83	110	83	17
	%	3.6	27.3	36.2	27.3	5.6
21. If an individual cannot apply operational (calculation) skills to real life, these skills are useless.	**N**	17	72	75	106	34
	%	5.6	23.7	24.7	34.9	11.2
22. Learning operational (calculating) skills is more important than problem-solving.	**N**	16	71	104	93	20
	%	5.3	23.4	34.2	30.6	6.6

23. Mathematics classes must not put weight on problem solving.	**N**	58	125	68	43	10
	%	19.1	41.1	22.4	14.1	3.3
24. Problem solving is not an important part of mathematics.	**N**	6	27	25	161	85
	%	2.0	8.9	8.2	53.0	28.0
25. Lots of individuals can get better at mathematics by studying.	**N**	6	9	15	168	106
	%	2.0	3.0	4.9	55.3	34.9
26. Studying improves the mathematical skills of an individual.	**N**	4	7	13	182	98
	%	1.3	2.3	4.3	59.9	32.2
27. I can get better at mathematics by studying a lot.	**N**	3	6	20	148	127
	%	1.0	2.0	6.6	48.7	41.8
28. An individual can develop his/her mathematical skills if s/he studies a lot.	**N**	103	157	35	9	4
	%	33.9	50.3	11.5	3.0	1.3
29. Studying a lot will improve an individual's skills to understand mathematics.	**N**	94	157	36	10	4
	%	30.9	51.6	12.8	3.3	1.3
30. If I study a lot, I can get better at mathematics.	**N**	129	150	16	6	3
	%	42.4	49.3	5.3	2.0	1.0
31. I study mathematics because I know how beneficial it is.	**N**	4	24	51	160	65
	%	1.3	7.9	16.8	52.6	21.4
32. Knowing mathematics will help me to get a job to earn my living.	**N**	1	10	28	157	108
	%	0.3	3.3	9.2	51.6	35.5
33. Mathematics is a class that worth the efforts.	**N**	2	6	26	156	114
	%	0.7	2.0	8.6	51.3	37.5
34. Mathematics will not be necessary for the tasks in my life.	**N**	124	133	21	20	6
	%	40.8	43.8	6.9	6.6	2.0
35. Mathematics is not related to my life.	**N**	146	118	19	18	3
	%	48.0	38.8	6.3	5.9	1.0
36. Studying mathematics is a waste of time.	**N**	182	95	14	10	3
	%	59.9	31.3	4.6	3.3	1.0

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Doi Number : http://dx.doi.org/10.31567/ssd.498

Table 5. Prospective Primary School Teachers Belief in Learning Mathematics for Gender Variable

Gender	N	X	Sd	t	p
Female	216	3.31	0.318	-2.542	0.012
Male	88	3.21			

*p<0.05

prospective primary school teachers' belief level to learn mathematics showed the statistically significant result in favour of females for gender variable (p<0.05). Accordingly, it is possible to say those female students studying in prospective primary school teachers' department have a higher belief in learning mathematics than male students.

Table 6. Prospective Primary School Teachers Belief in Learning Mathematics Mean Score Comparison for Class Level Variable

Classes	N	$\bar{X}$	Sd	Variance Source	Sum of Squares	Sd	Mean Square	F	p
1. Grade	58	3.21	0.340	Intergroup	0.501	3	0.167		
2. Grade	77	3.31	0.297	In-Group	29.440	300	0.098	1.703	0.166
3. Grade	88	3.26	0.280	Total	29.942	303	0.265		
4. Grade	81	3.32	0.350						
Total	304	3.28	0.314						

p>0.05

When the data in Table 3 was investigated, it was seen that prospective primary school teachers' belief level towards learning mathematics did not change with class level (p>0.05). While there was no statistically significant difference between prospective primary school teachers' belief to learn mathematics, it is possible to say that the highest belief to learn mathematics was at the 4th grade level. The lowest class level for beliefs to learn mathematics was 1st class level with a 3.21 average score.

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Doi Number : http://dx.doi.org/10.31567/ssd.498

Table 7. Prospective Primary School Teachers Belief in Learning Mathematics Mean Score Comparison for Graduated School Variable

Graduated High School	N	$\bar{X}$	Sd	Variance Source	Sum of Squares	Sd	Mean Square	F	p
Anatolian High School	164	3.29	0.313	Intergroup	1.916	11	0.174		
Religious Vocational High School	32	3.27	0.313	In-Group	28.025	292	0.096	1.815	0.051
Vocational and Technical High School	11	3.27	0.338	Total	29.942	303	0.270		
Multi-Program High School	10	3.38	0.365						
Anatolian Teaching High School	16	3.30	0.420						
MABEK	17	2.98	0.239						
Basic High School	25	3.36	0.286						
Science High School	3	3.20	0.200						
Open Education High School	2	3.30	0.000						
Social Science High School	14	3.24	0.256						
Health Vocational High School	7	3.37	0.180						
Private High School	3	3.17	0.115						
Total	304	3.28	0.314						

p>0.05

When the data in Table 4 was investigated, it was seen that prospective primary school teachers' belief in learning mathematics did not change for graduated high school type and the average belief scores were slightly larger than the statistical significance value (p>0.05). Still, it is possible to state that the lowest score of prospective primary school teachers' belief to learn mathematics was from students from Temporary Accommodation Centre Health Unit (MABEK) students established in container city 17 km away from Malatya city centre. This result is expected since the students from here are students who run away from their country because of the Syrian War. However, it is surprising students from private high school had the lowest score for the belief in learning mathematics following the students from this centre. It is possible to state that the prospective primary school teachers' belief to learn mathematics in multi-program high school, health vocational health school and basic high school were higher than students who graduated from other schools.

Table 8. Prospective Primary School Teachers Belief to Mathematical Problem Solving for Gender Variable

Gender	N	X	Sd	t	p
Female	216	3.20	0.203	0.831	0.407
Male	88	3.22			

*p>0.05

Prospective primary school teachers' belief level in mathematical problem-solving showed no statistically significant results for gender variable (p<0.05). Accordingly, it is possible to state that the belief in mathematical problem-solving scores was close for female students and male students in the primary school teaching department.

Table 9. Prospective Primary School Teachers Belief to Mathematical Problem-Solving Mean Score Comparison for Class Level Variable

Classes	N	$\bar{X}$	Sd	Variance Source	Sum of Squares	Sd	Mean Square	F	p
1. Grade	58	3.21	0.234	Intergroup	0.056	3	0.019		
2. Grade	77	3.31	0.153	In-Group	9.646	300	0.032	0.581	0.628
3. Grade	88	3.26	0.153	Total	9.702	303	0.051		
4. Grade	81	3.32	0.184						
Total	304	3.28	0.179						

p>0.05

When prospective primary school teachers' belief in mathematical problem-solving was investigated for class level, it was seen that belief did not change for class level (p>0.05). While prospective primary school teachers' belief in mathematical problem-solving did not change with class level, it is possible to state that the highest belief for mathematical problem-solving was in the 4th grade and the lowest was in the 1st grade.

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Doi Number : http://dx.doi.org/10.31567/ssd.498

Table 10. Prospective Primary School Teachers Belief to Mathematical Problem-Solving Mean Score Comparison for Graduated School Variable

Graduated High School	N	$\bar{X}$	Sd	Variance Source	Sum of Squares	Sd	Mean Square	F	p
Anatolian High School	164	3.21	0.175	Intergroup	0.401	11	0.036		
Religious Vocational High School	32	3.21	0.205	In-Group	9.301	292	0.032	1.145	0.326
Vocational and Technical High School	11	3.12	0.148	Total	9.702	303	0.068		
Multi-Program High School	10	3.21	0.183						
Anatolian Teaching High School	16	3.27	0.210						
MABEK	17	3.17	0.204						
Basic High School	25	3.24	0.134						
Science High School	3	3.31	0.127						
Open Education High School	2	3.26	0.334						
Social Science High School	14	3.14	0.192						
Health Vocational High School	7	3.29	0.134						
Private High School	3	3.10	0.112						
Total	304	3.20	0.179						

$p>0.05$

When prospective primary school teachers' belief in mathematical problem-solving was investigated for the graduated high school type, it was seen that belief did not change for the graduated high school type ($p>0.05$). When the graduated high school type was considered, primary school teacher students who graduated from science high school had higher belief in mathematical problem-solving than other school types. This might be due to more quantitative student selection in science high school election exams. Since the students from these high schools have more experience in mathematical problem-solving than students from other high school types, this might be evaluated as an expected result. It can be seen that the belief for mathematical problem-solving was the lowest for primary school teacher students from private high schools. While there was no statistically significant difference between graduated high school type, it is interesting for private high school students to have the lowest score despite more education in extracurricular studies.

The prospective primary school teachers' close score (3.17) of belief for mathematical problem-solving by students graduated from Temporary Accommodation Centre Health Unit (MABEK) to the average value of 3.20 might mean that the mathematical success of these students in their previous schools might be close to our country.

The Pearson Correlation analysis results between the answers to Prospective Primary School Teachers' Belief to Learn Mathematics Scale and Belief to Mathematical Problem-Solving Scale are given in Table 11.

Table 11. The Pearson Correlation analysis results between the answers to Prospective Primary School Teachers' Belief to Learn Mathematics Scale and Belief to Mathematical Problem-Solving Scale

Gender	N	X	Sd	1	2
Belief to Learn Mathematics Scale	304	3.28	0.314	-	0.196*
Belief to Mathematical Problem-Solving Scale	304	3.21	0.180	0.196*	-

*. Correlation is significant at 0.01 level (2-tailed).
**p<0.05

According to the Pearson Correlation Analysis results, s significant and positive relationship was found between prospective primary school teachers' answers to the Belief to Learning Mathematics Scale and answers to the Belief in Mathematical Problem-Solving Scale (r=0,196; p<0.001).

CONCLUSION AND SUGGESTIONS

In this part of the study, the results of each of the research questions are given in order. First of all, it was seen that the primary school prospective teachers were at a good level according to the average scores of the scale applied to determine their level of belief in learning mathematics (X=3.28/5.00). According to this situation, it can be said that there is no negativity in the beliefs of the primary school prospective teachers towards learning mathematics, and they expressed their opinion that they can learn mathematics like everyone else. In terms of gender, it was concluded that female students have more belief in learning mathematics than male students. In terms of grade level and graduated school, there was no significant difference between prospective teachers in terms of their belief in learning mathematics.

When the belief levels of prospective classroom teachers towards solving mathematical problems were examined, it was concluded that they were at a good level (X=3.21). It can be said that primary school prospective teachers stated that problem solving is an important part of mathematics and that problem solving will also positively affect their life skills. On the other hand, there was no significant difference in the beliefs of prospective classroom teachers towards solving mathematical problems according to the variables of gender, grade level and type of school they graduated from. It can be said that this situation is due to the situation in general mathematics education in Turkey. Because the same mathematics subjects and contents are given in all school types in general at primary, secondary and high school levels.

A significant and positive relationship was found between the answers given by the Primary School Prospective teachers to the Mathematical Learning Beliefs Scale and the Mathematical Problem Solving Beliefs Scale. However, it was expected that primary school prospective teachers' beliefs about learning mathematics, which are very close to each other, and their belief levels towards mathematical problem solving would be higher.

As a result of the research, it can be suggested to carry out projects on the use of mathematics in daily life and what it does in order to increase the belief levels of teacher candidates in mathematics. In order to improve the problem solving skills of pre-service teachers, it can be suggested that mathematics lessons should be handled holistically from theory to practice.

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