

# Investigation of inquiry skills of Social Studies pre-service teachers\*

Güldane DİNÇ BAY<sup>1\*\*</sup> 

<sup>1</sup>Social Studies Education, Institute of Social Sciences, Ordu University, Ordu, Türkiye.

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## Abstract

The research aimed to determine the level of inquiry skills among social studies pre-service teachers and investigate inquiry skills in various variables (gender, age, university, and class level). The research was designed as a descriptive study with the screening model. The sample group for the research comprised 200 social studies pre-service teachers in the Eastern Black Sea region. The demographic characteristics were identified with a 'Personal Information Form.' The 'Inquiry Skills Survey' developed by Aldan Karademir, and Sarcaloğlu (2013) was used as a data collection tool. The scale had Cronbach alpha reliability coefficient calculated as 0.83. Analysis of research data used non-parametric tests. Findings show that social studies pre-service teachers have inquiry skills at high levels. There was no significant difference in the total scale according to gender, age, university, and class-level variables. However, according to the gender variable, the 'acquire information' subdimension varied with the difference in favor of female pre-service teachers. In contrast, the 'self-confidence' subdimension varied in favor of male pre-service teachers. According to the age variable, there was a significant difference for the 'acquire information' subdimension in favor of teachers in the 22-23-year age group. According to the university variable, the 'acquire information' dimension significantly differed in favor of pre-service teachers attending Bayburt University. Additionally, it was determined that there was no significant difference in the inquiry skills of pre-service teachers according to the class variable.

## 1 Introduction

As new scientific developments occur with every passing minute, this situation involves many developments, while the world is faced with serious problems in the present day. It is not sufficient to just receive information and remember it alone. It is necessary to inquire because the inquiry is the way to obtain in-depth information (Güneş, 2016). Inquiry is 'to research, seeking answers about a topic by asking questions' (Turkish Language Institution, [TLI], 2018).

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Developments in science and technology increase the importance of a trained and equipped labor force that can adapt to change and contribute to directing development. The way to become a competent and prosperous society with a say in the world is through individuals with upper-level thinking skills who can produce information with the required qualities and interpret and solve problems (Daşcan, 2014, p.32). One of the common basic skills of research-inquiry skills encompasses awareness and conception of problems by asking accurate and meaningful questions, planning research related to what to do and how to do it to solve the problem, predicting outcomes, considering problems that may occur, testing results and developing ideas (Ministry of National Education [MoNE], 2004, p.734).

The most important factor affecting the development of a country is teachers, who have a significant impact on raising future generations (Çapa & Çil, 2000). Due to this importance, great responsibilities fall on teachers who perform educational activities (Arslan & Özpınar, 2008; Cerit, 2008; Çelikten, Şanal & Yeni, 2005). For teachers to effectively fulfill these responsibilities, they must have some skills. Among the skills required for qualified teachers who will shape future generations are inquiry, problem-solving, ability to critique, ability to think reflectively, ability to think creatively, and ability to use information technologies (Şen & Erişen, 2002). When these skills are investigated, one of the most basic features required for qualified teachers appears to be the skill of inquiry (Kuhn & Pease, 2008). Inquiry is a skill used in many areas of daily life by both teachers and students. In this context, teachers should have this skill and should be able to ensure students gain this skill effectively through teaching practices. The learning process for inquiry is emphasized to develop an in-depth understanding of students while acquiring information and skills, contrary to traditional approaches (Arseven, Dervişoğlu & Arseven, 2015, p.173). Based on these statements, asking questions can be an effective skill in ensuring children interact with each other and develop thinking and learning.

One of the primary aims of inquiry is to create a learning model enlivening upper cognitive skills in individuals, making meaningful learning possible. In education, the inquiry is defined as 'developing the students' inquiry skills with systematic questions and thus elevating thinking, understanding and learning levels.' Learning environments based on inquiry skills contribute to student skills by using information learned related to lessons, development of research, and inquiry abilities related to a topic by producing a variety of questions about a topic learned in classes (Perry & Richardson, 2001). Children ask questions due to their nature; they discover and understand the world. In this process, the inquiry is an important key during their upbringing ensuring life-long development (Lind, 1998; Wang Kinzie, & Guire 2010, p.381). Here, the actual task falling to teachers is not to observe the students' learning process from the outside but to offer the opportunity for learning to occur through understanding and conceptualization (Karamustafaoğlu & Havuz, 2016). In inquiry-based learning environments, learning is strengthened, ensuring that students discover different concepts in the learning process. When teaching, the targets of inquiry are diverse. For effective inquiry, teachers should actively include students in lessons. Thus, the opportunity arises for them to express their ideas and listen to other students' ideas in the class.

Additionally, important topics during teaching include the development of belief and the desire for student success. If the inquiry is good, teachers may assess the students' learning levels and thus may investigate the lessons (Tanişlı, 2013, p.84). In this context, the inquiry skill undertakes an important role in developing communication skills and increasing in-class socialization of

students by teaching lessons with different dimensions when students tire of written-verbal explanations.

Inquiry-based learning includes skills like measurement, observation, prediction, making inferences, creating hypotheses, data collection, determining and checking variables, and communication and is a scientific activity where students learn scientific thinking and how scientists work (National Research Council [NRC], 2000). With the implementation in learning environments, inquiry-based learning ensures students gain information, understand basic concepts and principles, develop basic and questioning skills and develop positive attitudes (Chiappetta & Adams, 2004). The inquiry has been assessed as an important learning element from past to present. At the same time, the inquiry has an important place in indirect education due to encourages thinking by activating the cognitive aspect of students. For students to gain inquiry skills, the role of the teacher implementing the program is important. When the teachers themselves and the students are the topics, it is necessary to have high levels of inquiry skills and to frequently include inquiry-based learning activities and teaching practices in the teaching process (Çelikten et al., 2005, p.220; Karapınar, 2016, p.4). Development, internalization, and effective inquiry skills are critical while still pre-service teachers. Additionally, developing inquiry skills is effective in developing other skills (Bedir & Duman, 2017).

The emergence of inquiry-based learning dates to the 1970s globally, while it became dominant in Turkey in 2005 and began to be reflected in curricula (Özkan & Bümen, 2014). Social sciences offer important opportunities to develop inquiry skills in curriculum content and interdisciplinary features. Teaching inquiry or inquiry-based teaching makes it possible for learners to question all kinds of problems they encounter throughout their lives, whether at or outside of school. A thinking individual is an asset to society. Social studies as a subject are aware of social problems and trends emerging linked to changing and developing world conditions and the needs of the age (Kornblum & Julian, 2012), and deal with knowing how to obtain knowledge and skills while solving problems with an interdisciplinary approach in terms of cultivating effective citizens (İlter, 2013).

In light of scientific and technological developments experienced in the present day, the primary aims of social studies education have been reshaped. Within this framework, an inquiry environment requires upper-level interaction between setting and individual. Regarding the quality of inquiry, questions should be designed to direct students toward being active, researching, investigating, and discovering (Babadoğan & Gürkan, 2002). Current and controversial topics related to acquirement in teaching involve classes associated with problem-solving using different debate techniques, critical thinking, evidence, decision-making, and research skills. The inquiry skill, stated to be a research skill, is also included in curricula as one of the skills to be learned within the scope of the 'Basic Competency Framework' (MoNE, 2018). The development of this skill with time is very much required in the present and future. As the need to acquire common basic skills in the curriculum, great responsibilities fall on teachers aiming to cultivate curiously, researching, and inquiring students (Elmalı & Yıldız, 2017).

The new problems encountered with every passing day and the emergence of inadequate information reveal the need for institutions or individuals who can develop solutions according to the changing conditions to achieve success. The need to cultivate individuals who will successfully solve these emerging problems directly affects the education-teaching process and aims (Özden, 2012, p.17). Raising individuals who are inquiring, think critically, have problem-solving skills, are

emotionally strong, and feel competent comes to the forefront. The contribution of social sciences in all areas of life in raising these individuals is undeniable. According to Dewey, education begins when the learner feels curious about the topic during learning-teaching activities (Davis, 2005). The inquiry skills necessary for students to resolve their curiosity include questioning, seeking answers to questions, the ability to determine the accuracy of the information, and assessment and interpretation of results. The importance of the constructivist approach in curricula can be seen in the social studies program since 2005 and the 2018 social studies curriculum.

Additionally, the 2005 curriculum included skills for the first time, with 15 skills in the 2005 program and 27 in the 2018 curriculum. The increase in skills shows the progression in the desired skill acquisitions of students. The current social studies curriculum attaches importance to the thinking and questioning of students (MoNE, 2017), while the 2005 social studies curriculum focused on developing inquiry, problem awareness, and conceptualization, planning methods to solve problems, predicting outcomes, and estimating possible problems, testing results and developing ideas. Additionally, the emphasis was on cultivating productive individuals aware of their rights and responsibilities (MoNE, 2005). The skill concept in the social studies curriculum is explained as 'abilities designed for acquisition, development, and transfer to live by students during the learning process' (MoNE, 2005). Occasional updates are made to curriculums due to the developments experienced globally and in our country. Within this scope, skills are included in the changes (Gelen, 2002). In the current social studies program, 'inquiry skills' are not directly included. However, skills like 'research, perception of change and continuity, critical thinking, empathy, observation, communication, awareness of stereotypes and prejudices, decision-making, media literacy, political literacy, problem-solving, social participation and innovative thinking' (MoNE, 2017) included in the program may be stated to have indirect relationships to inquiry skills.

Considering social studies pre-service teachers and the students they will raise in the future, pre-service teachers are frequently requested to have high inquiry skills, to ensure students gain and develop inquiry-based upper-level skills during teaching and to include inquiry-based teaching practices in their professional lives. Inquiry-based learning environments will provide more meaningful learning opportunities by developing students' experience, knowledge accumulation, and skills. It should not be forgotten that inquiry skills may constitute essential roles in future students' lives. For this reason, questioning learning environments should be created to ensure meaningful, concrete learning and thus, knowledge and skills should be assimilated and implemented.

When the relevant literature is screened, studies about the inquiry-based teaching framework were mainly performed abroad (Beshears, 2012; Kumari, Arora & Tiwari, 2015; Minner, Levy & Century, 2009; Sabbagh, 2009). In Turkey, studies with pre-service teachers, including participants from different branches, emphasized the variability in inquiry skills. Research about inquiry skills of pre-service teachers with different variables were performed (Abalı Öztürk, Bilgen & Bilgen, 2017; Aldan Karademir, 2013; Aldan- Karademir, Çaylı & Deveci, 2019; Alkış Küçükaydın, 2019; Arseven, Dervişoğlu & Arseven, 2015; Bakır, 2019; Balbağ & Aynur, 2020; Bedir & Duman, 2017; Bektaş & Yüksel, 2019; Elmalı & Yıldız, 2017; Hançer & Tüfekçi, 2017; Hotaman, 2008; Karamustafaoğlu & Havuz, 2016; Şahin, Arcagök, Boran, Mertol & Çetin, 2017; Tanışlı, 2013; Tuncer, Yelken & Tanrıseven, 2018; Yavuz, Arslan & Batdal Karaduman, 2018; Yılmaz & Karamustafaoğlu, 2015), while investigation of the inquiry skills of social studies pre-service teachers is limited to one study by Bektaş and Yüksel (2019), making it necessary to perform new

studies. Research into the inquiry ability of pre-service teachers and their ability to understand what students want, interpret and analyze their thoughts carries additional importance considering the students they will raise in the future. For these reasons, in this research, the aim was to investigate the inquiry skills of social studies pre-service teachers and determine whether they differ according to certain variables. Within this framework, the research is considered beneficial for revealing the inquiry skills of social studies pre-service teachers.

The research problem may be stated as the ‘determination of the quality of inquiry skills of social studies pre-service teachers and whether there are significant differences in terms of a variety of variables.’ In line with the research problem, this screening study sought answers to the following sub-questions:

1. Is there a significant difference in the inquiry skills of social studies pre-service teachers with the gender variable?
2. Is there a significant difference in the inquiry skills of social studies pre-service teachers with the age variable?
3. Is there a significant difference in the inquiry skills of social studies pre-service teachers with the university variable?
4. Is there a significant difference in the inquiry skills of social studies pre-service teachers with the class level variable?

## 2 Method

### 2.1 Research method

The descriptive screening (survey) model from quantitative research methods was used in this research. Screening research includes broad samples when describing the present situation. The reason for keeping the sample large is to generalize to situations similar to the research (Büyüköztürk, 2011; Çepni, 2010).

### 2.2 Research group

The population for the research comprised social studies pre-service teachers attending 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> year in the social studies departments of education faculties in five different universities located in the Eastern Black Sea region in the spring semester of the 2021-2022 academic year. The sample for the research comprised a total of 200 pre-service teachers, including 137 women and 63 men, determined by the simple random sampling method. Descriptive statistics related to the sample group are shown in Table 1.

**Table 1** Demographic characteristics of social studies pre-service teachers

Category	Value	<i>f</i>	%
Gender	Man	63	31.5
	Woman	137	68.5
Age	18-19	32	16
	20-21	77	38.5
	22-23	50	25
	24 and above	41	20.5
	Gaziosmanpaşa University	26	13
University	Amasya University	28	14
	Bayburt University	73	36.5
	Ordu University	23	11.5
	Recep Tayyip Erdoğan University	50	25

Class level	1 <sup>st</sup> -year	54	27
	2 <sup>nd</sup> -year	42	21
	3 <sup>rd</sup> -year	56	28
	4 <sup>th</sup> -year	48	24
Total		200	100

### 2.3 Data collection tools

The data collection tool used in the research comprised two sections. The 1st section was the 'Personal Information Form' prepared by the researcher to collect information about pre-service teachers' characteristics. This section comprised a total of four questions about the gender, age, university, and class level of the pre-service teachers. The 2nd section used the "Inquiry Skills Scale" developed by Aldan Karademir and Saracaloğlu (2009). The scale is a 5-point Likert type (always=5, mostly=4, sometimes=3, rarely=2, and never=1) with 15 items and no inverse items. The scale includes three subscales. The highest points obtained from the Inquiry Skills Scale are 70, while the lowest is 14. High points indicate high inquiry skill qualities, while low points show low rate. The Cronbach alpha values for the subscales, items, and general scale are given below in Table 2.

**Table 2** ISS items and alpha coefficients

Subdimensions	Items	Cronbach Alpha Reliability Coefficients
Acquiring information	1,4,7,11,13,14	.67
Checking information	2,5,8,9,14	.69
Self-confidence	3,6,10	.83
Total	14	.83

The scale used in the study comprised 14 items and three subscales and had Cronbach alpha values from 0.52 to 0.94. These values show that the subdimensions and general scale are reliable. Accordingly, the reliability level of the scale appears to be high.

### 2.4 Data collection process

The scale used as a data collection tool in the research was organized as an online survey to reach participants. To apply the online survey to participants, permission to apply the survey was obtained from the institutions of the teachers registered in social studies teaching education. Participants were told that participation in the survey was not mandatory. Participation in the survey began by clicking on the connection providing direct website access. After survey access was ended, data were externally transferred to an Excel file. The obtained data file (n=200) was transferred to the SPSS data analysis program for data analysis. The obtained data were analyzed using descriptive statistics.

### 2.5 Data analysis

Within the research framework, the status of having inquiry skill qualities were examined with analyses of the inquiry skills scale with the aid of the SPSS statistical program. The 'inquiry skills' points were calculated to determine the quality of social studies pre-service teachers. Later, the arithmetic mean and standard deviation of the points were calculated. The arithmetic means intervals, taken as the basis for assessing the research findings, were rated by dividing into criteria by the researchers as 1.00-1.80 very low, 1.81-2.60 low, 2.61-3.40 moderate, 3.41-4.20 good, and 4.21-5.00 very good. The arithmetic mean points on the scale were between 1.00 and 5.00, so as points approached 5.00, the inquiry skills of pre-service teachers were high, while as the points

approached 1.00, inquiry skills were accepted as being low (Aldan Karademir & Saracaloğlu, 2013).

The obtained data were analyzed within the framework of the aims using the SPSS program. Analysis of data obtained from the scale was completed with descriptive statistical analysis. Before data from pre-service social studies teachers was analyzed, the data were tested for normal distribution. As the amount of data was 50 and above (Büyüköztürk, 2011), the Kolmogorov-Smirnov test results were investigated. The kurtosis value for the inquiry skills scale was 3.029, while the skewness value was .308. If values are between -1.96 and +1.96, the factors are assumed to have a normal distribution (Yücenur, Demirel, Ceylan & Demirel, 2011, p.162). In this situation, the data do not appear to have a normal distribution. The significance level was taken as  $p < .05$  in the research. If the p-value is significant ( $p > .05$ ), the distribution is accepted as usual (Gürüş & Astar, 2014, s.185). Suppose the p-value is more significant than 0.05. In that case, the points at the significance level do not show significant (excessive) deviation from a normal distribution. They can be interpreted as abiding by a normal distribution (Büyüköztürk, 2011, s.42). Based on these criteria, the values obtained were identified not to show normal distribution ( $p < .05$ ), and the decision was made to apply non-parametric tests. The Mann-Whitney U test was also used for data in groups with two variables. For groups with more than two variables, the Kruskal Wallis H test was used. The Mann-Whitney U analysis was used for two-way comparisons to determine which groups caused the difference and if the difference was significant.

### 3 Findings

In this section, attempts are made to solve the research sub-problems.

#### 3.1 Findings related to the first sub-problem

The first sub-problem in the research was ‘is there a significant difference in the inquiry skills of social studies pre-service teachers with the gender variable?’ Statistical data relating to gender according to the subdimensions of the scale tool are presented in Table 3.

**Table 3** Mann-Whitney U test results for scale subdimension points of participants according to gender

Subdimension	Gender	n	$\bar{X}$	Ranked mean	Rank total	U	Z	*p
Acquiring information	Man	63	4.01	83.00	5229.00	3213	-2.916	.004
	Woman	137	4.20	108.55	14871.00			
Checking information	Man	63	3.81	107.99	6803.50	3843.5	-1.249	.212
	Woman	137	3.73	97.05	13296.50			
Self-confidence	Man	63	3.79	117.68	7414.00	3233.5	-2.866	.004
	Woman	137	3.40	92.60	12686.00			

\* $p \leq 0.05$

For social science pre-service teachers, calculating the relationship between inquiry skills according to gender used the Mann-Whitney U test. According to the analysis results, there was a significant difference in favor of female pre-service teachers for the ‘acquiring information’ subdimension [ $u=3213$ ,  $z=-2.916$ ,  $r=-0.20$ ,  $p < .05$ ]. According to this finding, female pre-service teachers ( $\bar{X}=4.20$ ) had higher levels of acquiring information than male pre-service teachers ( $\bar{X}=4.01$ ). For the ‘checking information’ subdimension no significant difference formed [ $u=3843.5$ ,  $z=-1.249$ ,  $r=0.08$ ,  $p > .05$ ]. Though male students' mean inquiry skills points ( $\bar{X}=3.81$ ) were slightly higher than female students ( $\bar{X}=3.73$ ), this difference did not appear to reach significant levels. For the ‘self-confidence’ subdimension, there was a significant difference in favor of male pre-service

teachers [ $u(198)=3233.5$ ,  $z=-2.866$ ,  $r=0.20$ ,  $p<.05$ ]. According to this finding, male pre-service teachers ( $\bar{X}=3.79$ ) had higher self-confidence levels than female pre-service teachers ( $\bar{X}=3.40$ ). Based on this, it can be said there are significant differences between the inquiry skills of pre-service teachers.

### 3.2 Findings related to the second sub-problem

The second sub-problem in the research was stated to be ‘is there a significant difference in the inquiry skills of social studies pre-service teachers with the age variable?’ Statistical data related to age according to subdimensions of the scale tool are presented in Table 4.

**Table 4** Results for the Kruskal-Wallis U test for scale subdimension points according to participant age.

Subdimension	Age	n	$\bar{X}$	Ranked mean	KW	df	*p
Acquiring information	18-19	32	4.02	88.58	8.459	3	.037
	20-21	77	4.10	92.69			
	22-23	50	4.29	119.87			
	24 and above	41	4.15	100.85			
Checking information	18-19	32	3.64	88.98	2.996	3	.392
	20-21	77	3.75	98.56			
	22-23	50	3.82	110.88			
	24 and above	41	3.78	100.46			
Self-confidence	18-19	32	3.38	87.81	2.236	3	.525
	20-21	77	3.58	103.01			
	22-23	50	3.53	99.47			
	24 and above	41	3.52	106.94			

\* $p \leq 0.05$

The Kruskal Wallis H test was used to calculate the relationships between inquiry skills of social studies pre-service teachers according to the age variable. According to the analysis results, it appears the ‘acquiring information’ subdimension had a significant difference in favor of pre-service teachers in the 22-23 year age group [ $kw=8.859$ ,  $p<.05$ ]. According to this finding, pre-service teachers aged 22-23 years ( $\bar{X}=4.29$ ) had higher acquiring information skills levels than pre-service teachers aged 18-19 years ( $\bar{X}=4.02$ ). For the ‘checking information’ subdimension, though the mean inquiry skills of teachers aged 22-23 years ( $\bar{X}=3.82$ ) were slightly higher than teachers aged 18-19 years ( $\bar{X}=3.64$ ), this difference did not appear to reach significant levels [ $kw=2.996$ ,  $p>.05$ ]. For the ‘self-confidence’ subdimension, though the mean points for inquiry skills of 20-21-year-old pre-service teachers ( $\bar{X}=3.58$ ) were slightly higher than for 18-19-year-old pre-service teachers ( $\bar{X}=3.38$ ), this difference did not reach significant levels [ $kw=2.236$ ,  $p<.05$ ].

### 3.3 Findings related to the third sub-problem

The third sub-problem in the research was ‘is there a significant difference in the inquiry skills of social studies pre-service teachers with the university variable?’ The statistical data related to university according to subdimensions of the scale tool are presented in Table 5.

**Table 5** Kruskal Wallis U test results for scale subdimension points of participants according to university

Subdimension	University	n	$\bar{X}$	Ranked mean	KW	df	*p	Posthoc
Acquiring information	GPU	26	3.38	70.63	16.440	4	.002	GU-BU RTEU-BU
	AU	28	4.20	104.95				
	BU	73	4.27	116.13				
	OU	23	4.24	110.70				
	RTEU	50	4.02	86.03				



Checking information	GOPU	26	3.77	101.21	1.328	4	.857
	AU	28	3.80	100.80			
	BU	73	3.68	94.92			
	OU	23	3.84	107.70			
	RTEU	50	3.79	104.79			
Self-confidence	GOPU	26	3.44	94.69	4.008	4	.405
	AU	28	3.64	106.64			
	BU	73	3.39	92.66			
	OU	23	3.50	99.15			
	RTEU	50	3.70	112.15			

\* $p \leq 0.05$  GOPU: Gaziosmanpaşa University, AU: Amasya University, BU: Bayburt University, OU: Ordu University, RTEU: Recep Tayyip Erdoğan University.

According to the university of social studies, pre-service teachers calculated the relationship between inquiry skills using the Kruskal Wallis H test. According to the analysis results, pre-service teachers' inquiry skills did not differ according to the university variable. For the 'acquiring information' subdimension, there was a significant difference in favor of pre-service teachers attending Bartın University [ $kw=16.440$ ,  $p < .05$ ]. According to this finding, pre-service teachers attending Bayburt University ( $\bar{X}=4.29$ ) had higher acquiring information skills than pre-service teachers attending Gaziosmanpaşa University ( $\bar{X}=3.38$ ). As a result of the Dunn-Bonferroni posthoc test, the difference in acquiring information points according to university was identified to be due to the GOPU-BU and RTEU-BU groups. For the 'checking information' subdimension, the mean inquiry skills points of pre-service teachers attending Ordu University ( $\bar{X}=3.84$ ) were slightly higher than the points for pre-service teachers attending Bartın University ( $\bar{X}=3.68$ ); however, this difference did not reach significant levels [ $kw=1328$ ,  $p > .05$ ]. For the 'self-confidence' subdimension, pre-service teachers attending Recep Tayyip Erdoğan University ( $\bar{X}=3.70$ ) had mean inquiry skill points that were higher than the points for pre-service teachers attending Bayburt University ( $\bar{X}=3.39$ ); however, this difference did not appear to be at significant levels [ $kw=4.008$ ,  $p < .05$ ].

### 3.4 Findings related to the fourth sub-problem

The fourth sub-problem in the research was stated as 'is there a significant difference in the inquiry skills of social studies pre-service teachers with the class level variable?' The statistical data related to class level according to the subdimensions of the scale tool are presented in Table 6.

**Table 6** Kruskal Wallis U-test results for scale subdimension points of participants according to class

Subdimension	Class	n	$\bar{X}$	Ranked mean	KW	df	*p
Acquiring information	1 <sup>st</sup> -year	54	4.14	101.94	2.140	3	.544
	2 <sup>nd</sup> -year	42	4.09	90.63			
	3 <sup>rd</sup> -year	56	4.20	107.58			
	4 <sup>th</sup> -year	48	4.13	99.25			
Checking information	1 <sup>st</sup> -year	54	3.74	98.44	1.935	3	.586
	2 <sup>nd</sup> -year	42	3.86	109.44			
	3 <sup>rd</sup> -year	56	3.75	102.17			
	4 <sup>th</sup> -year	48	3.68	93.05			
Self-confidence	1 <sup>st</sup> -year	54	3.43	92.61	3.775	3	.287
	2 <sup>nd</sup> -year	42	3.67	112.54			
	3 <sup>rd</sup> -year	56	3.46	94.79			
	4 <sup>th</sup> -year	48	3.56	105.51			

\* $p \leq 0.05$

The Kruskal Wallis H test was used to calculate the relationships between inquiry skills according to the class level variable of social studies pre-service teachers. According to the analysis results, the inquiry skills of pre-service teachers did not have a significant difference according to the class variable. For the 'acquiring information' subdimension, 3rd-year pre-service teachers ( $\bar{X}=4.20$ ) had slightly higher mean inquiry points compared to 1st-year pre-service teachers ( $\bar{X}=3.68$ ); however, this difference did not appear to reach significant levels [kw=2.140,  $p<.05$ ]. For the 'checking information' subdimension, the mean inquiry skill points of 2nd-year pre-service teachers ( $\bar{X}=3.86$ ) were slightly higher than the points for 4th-year pre-service teachers ( $\bar{X}=3.68$ ); however, this difference did not reach significant levels [kw=1.935,  $p>.05$ ]. For the 'self-confidence' subdimension, the mean inquiry skill points of 2nd-year pre-service teachers ( $\bar{X}=3.67$ ) were slightly higher than the points for 1st-year pre-service teachers ( $\bar{X}=3.43$ ); however, this difference did not appear to reach significant levels [kw=3775,  $p<.05$ ]. According to the findings, the class level variable was not essential for inquiry skills.

#### 4 Discussion

According to the research results, the general mean points for social studies pre-service teachers on the inquiry skills scale were '3.87', a good level. Based on this finding, pre-service teachers' inquiry skills may be at a good level. One of the important results emerging from the research findings is that the social studies pre-service teachers had the highest mean points on the inquiry skills scale for the 'acquiring information' subdimension. Accordingly, with mean points of '4.14' for the acquiring information subdimension, social studies pre-service teachers were determined to have a 'very good' level of acquiring information skills. The mean points for the 'checking information' subdimension were '3.75', which was higher than the mean points for the 'self-confidence' subdimension at '3.52', indicating that social studies pre-service teachers had 'good' levels for these two subdimensions.

When the literature is investigated, the research included in the literature with similar results to this study is found. Çavuşlu (2014), Arseven et al. (2015), Bedir (2017), Yılmaz and Karamustafaoğlu (2015), İnel Ekici (2016), Şahin et al. (2017), Aldan Karademir and Saracaloğlu (2017), Öztürk et al. (2017), Bedir and Duman (2017), Elmalı and Yıldız (2017), Hançer and Tüfekçi (2017), Tuncer et al. (2018), Elmalı and Yıldız (2017) Yavuz et al. (2018) showed the inquiry skills of pre-service teachers were generally above the average in research including pre-service teachers attending different branches. This supports the results of our research. This result shows that pre-service teachers generally have high inquiry skills. Based on this thought, it can be said that social studies pre-service teachers may apply their inquiry-based skills in the teaching profession. Similarly, studies by Balım (2003); İnel and Evrekli (2008) with teachers showed that the perceptions related to the inquiry skills of teachers were positive-high. A study by Yüksel (2019) found that pre-service teachers generally had positive opinions about inquiry skills; however, it was identified that they encountered a range of problems in acquiring and developing inquiry skills. Additionally, inquiry skills were identified to contribute to teaching skills, and teachers' opinions about what should be done to ensure students acquire inquiry skills were noted. Studies with contrary results are limited (Aldan Karademir, 2013; Tanışlı, 2013). When studies performed in Turkey about inquiry skills were investigated, studies were mainly performed with science pre-service teachers and about science and technology lessons.

When research performed abroad is investigated, it generally focuses on research-inquiry-based learning. Rather than revealing the products of the research-inquiry-based learning model,

students' inquiry skills are ensured by emphasizing the research process (Lim, 2001). In the study by Minner, Levy, and Century (2009), significant differences were identified in inquiry-based teaching practices ensuring active thinking of students and the ability to infer outcomes from data. The study by Sabbagh (2009) aimed to investigate factors assisting in introducing inquiry-based learning to students and teachers' ability to use it in classes. According to the research findings, inquiry-based learning in schools was identified as necessary to create schools, sustain the existence of schools, strengthen questioning by school leaders and be a model for students. The inquiry was determined to be a school culture that required implementation from students and the school cadre (administrators and teachers). The study by Kim (2015) identified that in discussion-based inquiry, teachers spoke less; however, when teachers asked open-ended questions more frequently in traditional classes, the responses of students in the inquiry class were found to be at a higher level proportionally compared to students in the traditional class. The study by Beshears (2012) identified that teachers' teaching and learning perceptions, especially opinions about inquiry-based teaching, differed in practice. Based on this idea, it was determined that they determine a transition from teacher-centered understanding to a student-centered one with inquiry-based learning. Kumari, Arora, and Tiwari (2015) determined that students receiving lessons with inquiry-based teaching displayed more development compared to the traditional teaching model.

According to findings obtained in the first sub-problem, the inquiry skills of pre-service teachers displayed a significant difference according to the gender variable. According to the findings for the first sub-problem, a significant difference in favor of women pre-service teachers emerged. This result may be due to female pre-service teachers checking questions asked on the exam repeatedly, being selective about information, recalling previous information, revising information, and having more inquiring and listening skills in the class environment compared to male pre-service teachers. No significant difference was observed for the 'checking information' subdimension. For the 'self-confidence' subdimension, a significant difference appeared in favor of male pre-service teachers. According to this result, male pre-service teachers have higher self-confidence levels when giving opinions about a topic being explained to the class without hesitation, the ability to state they don't know about a topic discussed in class, and asking teachers about a topic that is not understood compared to female pre-service teachers. Based on this, the inquiry skills of pre-service teachers can be said to differ significantly between genders. The result obtained in this study is parallel to other studies. Studies by Bedir and Duman (2017), and Alkış Küçükaydın (2020) with pre-service teachers observed that female participants had higher points for the 'acquiring information' subdimension, while male participants had higher points for the 'self-confidence' subdimension. In the literature in terms of gender, just as there are parallel results related to differentiation in favor of women (Karademir, 2013; İnel Ekici, 2016), it appears contradictory results are also observed (Elmalı & Yıldız, 2017; Hançer & Tüfekçi, 2017; İnaltekin & Akçay, 2012; Yılmaz & Karamustafaoğlu, 2015; Şahin, et al., 2017).

According to findings obtained for the second sub-problem, the inquiry skills of social studies pre-service teachers did not differ significantly according to the age variable. A significant difference was observed in favor of pre-service teachers aged 22-23 for the 'acquiring information' subdimension. According to this finding, 22-23 year old pre-service teachers had higher acquiring information skill levels than 18-19 year old pre-service teachers. There was no significant difference for the 'checking information' subdimension. The mean points of 22-23 year old pre-service teachers were slightly higher than 18-19-year-old pre-service teachers; however, this

difference did not appear to reach significant levels. In this context, 22-23 year old social studies pre-service teachers may be said to be curious about acquiring information and to be closer to educational qualities by developing research-inquiry skills. When the relevant literature is screened, contrary to the research findings, the study by İnel Ekici (2016) entitled 'Investigation of Factors Affecting Perception of Scientific Research Skills of Middle School Students' identified a significant difference according to the age variable. Tuncer, Yanpar, Yelken, and Tanrıseven (2018) identified a significant difference according to the age variable for inquiry skills in students in a philosophy group. This difference favored the 31-40 age group compared to the 21-30 age group and the 41-50 age group.

According to findings obtained for the third sub-problem, the inquiry skills of social studies pre-service teachers did not differ significantly according to the university variable. For the 'acquiring information' subdimension, there was a significant difference in favor of pre-service teachers attending Bayburt University. According to this finding, pre-service teachers attending Bayburt University had higher acquiring information skill levels than those attending Gaziosmanpaşa University. This difference was identified between Gaziosmanpaşa University and Bayburt University groups and between Recep Tayyip Erdoğan University and Bayburt University groups. For the 'checking information' sub-dimension, no significant difference was formed. Though the mean points for inquiry skills of pre-service teachers attending Ordu University were higher than those attending Bayburt University, this difference did not reach significant levels. No significant difference was found for the 'self-confidence' subdimension. The mean points of pre-service teachers attending Recep Tayyip Erdoğan University were higher than those attending Bayburt University; however, this difference did not appear to reach significant levels. When the literature was screened, no study was encountered about inquiry skills in the university variable.

According to findings obtained for the fourth sub-problem, the inquiry skills of pre-service teachers did not show a significant difference according to class level. This finding indicates that the class level variable is insignificant for inquiry skills. The lack of significant difference in the inquiry skills of pre-service teachers according to class level may be due to teaching the students research-inquiry components in primary education received during the education-teaching training of pre-service teachers. When the literature is investigated, there are similar outcomes encountered in terms of this variable (Elmalı & Yıldız, 2017; Hançer & Tüfekçi, 2017; Şahin et al., 2017; Yavuz et al., 2018; Yılmaz et al., 2009; Yılmaz & Karamustafaoğlu, 2015), while there are also studies about differences in terms of the class variable (Bedir, Duman, 2017; Çavuşlu, 2014; İnel Ekici, 2016).

## 5 Conclusions

In conclusion, in this study, social studies pre-service teachers appeared to have good inquiry skills with a mean of 3.87. In this context, according to the findings of the inquiry skills scale, social studies pre-service teachers were identified to have inquiry skills at a high level. According to the inquiry skills scale findings, for the 'acquiring information' subdimension, significant differences were identified in favor of female pre-service teachers, pre-service teachers in the 22-23 age group, and pre-service teachers attending Bayburt University. In this context, it may be said they have skills in acquiring information like the ability to distinguish which information is needed, to organize available information, to use previous information when faced with a problem, to review information to answer questions asked within the class and to listen effectively to responses given to the questions of classmates. For the 'self-confidence' subdimension, a significant difference was

identified in favor of male pre-service teachers. In this context, male pre-service teachers can be said to have self-confidence skills like the ability to freely express their thoughts and feelings about any topic discussed in class and ask the teacher about a subject they don't know within the class environment. Further, the inquiry skills of pre-service teachers were determined not to differ according to the class variable. Within this framework, the class level was concluded not to be an influential variable in determining the inquiry skills of social studies pre-service teachers.

## 6 Recommendations

This research to determine the inquiry skill levels of social studies pre-service teachers is limited to social studies pre-service teachers attending education faculties at Gaziosmanpaşa University, Amasya University, Ordu University, Bayburt University, and Recep Tayyip Erdoğan University in the 2020-2021 academic year. Similar research may be performed with pre-service teachers in different universities and attending different departments. For this reason, it may be applied to pre-service teachers or teachers in different fields to associate inquiry skills with different disciplines. This study determined that pre-service teachers' questioning skills average scores were at a good level. However, since this situation is limited to the cognitive domain, it may not reflect the application area. For this purpose, studies can be conducted to determine how much of the questioning skills of pre-service teachers' are applied. It is thought that increasing the number of studies will be important in teacher education.

Though the number of studies that found the inquiry skill levels of pre-service teachers were adequate is in the majority, contrary results should be included in the literature. Within this framework, implementations should be ensured in educational faculties in universities aiming to acquire, develop and sustain inquiry skills. Considering that today's pre-service teachers are tomorrow's teachers, this is a necessary reason institutions training teachers should increase quality and cultivate individuals who can research, question, discuss, and approach problems with a solution focus.

## 7 Statement of researchers

In this section, you are expected to declare the information regarding the titles given below.

**7.1 Researchers contribution rate statement:** Studies about inquiry skills have generally been performed in the science and technology educational fields. In the social studies field, this is limited to the study by Bektaş and Yüksel (2019), which makes performing this study necessary.

**7.2 Support and thanks:** As stated by Freud, 'words have a magical power.' I think my esteemed supervisor performed this study to contribute to the literature. Assoc. Prof. Dr. Talip ÖZTÜRK for his patience and assistance.

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