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Investigating The Locus of Control and Epistemological Beliefs of Social Studies Teacher Candidates in Turkey

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Abstract: This study aimed to examine the locus of control and epistemological beliefs of social studies teacher candidates. The research, which adopted a survey model, was conducted with 550 social studies teacher candidates studying at 7 state universities in Turkey. The Locus of Control Scale and the Epistemological Belief Scale were used to collect research data. Descriptive statistics, independent samples t-test, one-way analysis of variance (ANOVA), Scheffe test, and correlation analysis were employed in the data analysis process. When evaluating the research results, it was determined that the teacher candidates generally responded to the locus of control scale at an "appropriate" level and to the epistemological belief scale at an "agree" level." While no significant difference was observed in the locus of control beliefs of social studies teacher candidates based on gender, a significant difference was found in the sub-scale of belief in an unjust world. It has been determined that female teacher candidates have a higher external locus of control belief. No significant difference was observed in social studies teacher candidates' locus of control beliefs regarding their parents' educational levels and grade level. However, there was a significant difference in the sub-scale of belief in an unjust world regarding grade level. It was observed that there was a significant difference in the epistemological beliefs of social studies teacher candidates regarding gender. It was revealed that female teacher candidates had underdeveloped /immature epistemological beliefs. No significant difference was found in the epistemological beliefs of teacher candidates based on their parents' educational levels or grade level. It has been observed that there is a weak but positive significant relationship between the social studies teacher candidates' locus of control and epistemological beliefs and their sub-scales.

Keywords: locus of control; epistemological belief; social studies

1. Introduction

In today's world, as education and philosophy have integrated with each other, studies on knowledge and learning have gained momentum, and the concept of "epistemology" has become an important research area. Epistemology, derived from the combination of the Greek words "episteme" meaning "knowledge" and "logos" meaning "word, reason, science, explanation, and theory," is a branch of philosophy that directly deals with the concept of knowledge [1]. Epistemology is a branch that investigates the source, nature, and scope of human knowledge, as well as the criteria for determining what constitutes true knowledge or truth [2–4].

Epistemological beliefs, as they are conceived of by educational psychologists, refer to beliefs about the nature, source, justification, acquisition, and structure of knowledge [4]. Epistemological beliefs that constitute a broad and significant research area are of great importance in today's world and in the field of education. When epistemological beliefs are considered as the perception, interpretation, and internalization of knowledge, it can be observed that these beliefs influence individuals' attitudes and behaviors. This highlights the importance of the development of epistemological beliefs.

Although epistemology is typically associated with philosophy, the interest in epistemological beliefs (beliefs about knowledge and learning) began with William Perry [5,6] proposed that students

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go through developmental stages of epistemological beliefs. In the initial stage, students accept knowledge as either right or wrong and believe that experts have all the answers. In the late stages of development, however, students believe that there can be multiple possibilities and that even strong beliefs can change. Perry, along with many subsequent researchers, asserted that epistemology is unidimensional and develops through fixed stages. However, Schommer viewed that considering epistemological beliefs solely in terms of beliefs about knowledge was a limited approach. According to Schommer, epistemological beliefs encompass not only beliefs about knowledge but also beliefs about the ability of learning and teaching (intelligence) related to the acquisition and use of knowledge, and epistemological beliefs should be considered as a belief system [7]. Schommer designed multidimensional epistemological perspectives and her epistemological belief model consists of the following dimensions: (1) beliefs about the source of knowledge, (2) beliefs about the certainty of knowledge, (3) beliefs about the structure of knowledge, (4) beliefs about the speed of learning, and (5) beliefs about the stability of knowledge [8]. If individuals have complex belief tendencies, they believe that knowledge is not absolute or certain, that a significant portion of it is still in the developmental stage, and that knowledge has not been discovered yet. These individuals possess a critical perspective, are knowledgeable, and experienced. On the other hand, those who have simple epistemological beliefs lack a critical perspective and are inexperienced. According to Schommer, individuals may hold beliefs that a significant portion of knowledge is certain and unchangeable, that some knowledge will be newly discovered, and that only a small portion of knowledge will change. Schommer suggests that individuals can possess beliefs that are at different levels of development in terms what knowledge is and how it is obtained and that coexist and thus these beliefs have an impact on students' behaviors [7]. Due to the significant impact of beliefs on individuals' thoughts and behaviors, beliefs from different categories have gained prominence in the educational process. In addition to epistemological beliefs, locus of control beliefs has also been considered as one of the relevant beliefs [9].

In personality psychology, locus of control refers to the extent to which individuals believe that they can control events that affect them. Understanding of the concept was developed by Julian B. Rotter in 1954 and and since then, it has since become an aspect of personality studies. A person's "locus" (Latin for "place" or "location") is conceptualized as either internal (the person believes they can control their life) or external (they believe that their decisions and life are controlled by environmental factors which they cannot influence) [10].

In the social learning theory developed by Rotter (1966), the concept of locus of control was defined. The individual's experiences of punishment and rewards due to their behaviors lead to the development of certain expectations about the outcomes of their future behaviors. Rotter referred to these expectations as beliefs about internal or external control sources, and he called the place where the forces determining positive or negative events in life (rewards and punishments) have more control over in life as the locus of control [11]. Locus of control represents the degree to which individuals believe that they can have control over the perceptions about the underlying causes of events in their lives and events that affect them [10].

Individuals with a high internal locus of control believe that they have a significant level of personal control over events in their lives [12]; they believe that events in their lives primarily stem from their own actions. For example, when evaluating exam results, people with an internal locus of control praise or blame themselves, while individuals with an external locus of control praise or blame the teacher or the test. Individuals with an "internal locus of control" generally believe that their successes or failures are a result of the effort and hard work they put into their education. Individuals with an "external locus of control focus, on the other hand, generally believe that their successes or failures are attributed to external factors beyond their control, such as luck, fate, circumstances, injustice, prejudice, or teachers who are unfair, biased, or unqualified [10]. Briefly, internal versus external control refers to the degree to which people expect that a reinforcement or an outcome of their behavior is contingent on their own behavior or personal characteristics versus the degree to which people expect that the reinforcement or outcome is a function of chance, luck, or fate, is under the control of powerful others, or is simply unpredictable [13].

Rotter states that the locus of control is a personality dimension that ranges from externality to internality, and individuals can vary in their position on this dimension. However, it would be incorrect to categorize individuals into unchanging categories of having internal and external locus of control when it comes to predicting behavior because having an internal or external locus of control is associated with many characteristics of individuals, such as their learning style, cognitive structures, self-confidence, and motivation [11]. Individuals tend to prefer an internal locus of control when they succeed and more external locus of control when they fail. Thus, individuals show a tendency that allow them to maintain cognitive and emotional balance and make judgments that serve their ego.

In the educational process, aiming for the transformation of individuals with external locus of control into individuals with internal locus of control is not only important for academic achievement but also crucial for fostering the overall development of the individual. Thus, it serves the goal of education in building a democratic society [11].

When reviewing the literature, it is seen that there are studies related to both epistemological beliefs and locus of control, and these studies have also been carried out on teacher candidates. As a result of the literature review, the studies that aim to determine the epistemological beliefs of teacher candidates based on various variables have been encountered. In this context, Karabulut and Ulucan (2012) examined the level of scientific epistemological beliefs of 1st and 4th year students studying in physical education and sports teaching departments of different universities [14]. In addition, Can and Arabacıoğlu (2009) determined the epistemological beliefs of pre-service science and mathematics teachers based on certain variables [15].

In the literature, the epistemological beliefs of teacher candidates have been studied by associating them with various variables. These variables include the following: learning and learning styles [16]; adopted education philosophy [17]; level of reading motivation [18]; principles of pedagogy [19]; competency of Technological Pedagogical Content Knowledge (TPACK) education [20]; dispositions, and views on teaching as persuasion [21]; concept teaching [22]; predictors of internet based learning activities [23]; (Bra˚ten and Strømsø, 2006); problem-solving and levels of powerfulness [24]; problem-solving strategies [25]; (Öngen, 2003); environmental knowledge and environmental attitudes [26]; academic achievement [27]; (Arslantaş, 2015); learning [28]; learning approaches and study orchestrations [29,30]; epistemological worldviews and self-efficacy beliefs [31]; socio-cultural factors [32]; informal reasoning regarding socio-scientific issues [33]; argumentativeness and achievement levels [34] learning approaches [35] resolving conceptual and empirical issues [36]; exploring bilingual [37]; learning tactics and success [38]; attitudes towards chemistry course [39]; the nature of knowing [5].

In addition to these studies, there is a study [3] involved a survey conducted with teacher candidates in Hong Kong. In this study, epistemological beliefs were divided into four dimensions and teaching and learning concepts were divided into two dimensions, and the relational analysis of the concepts of teaching and learning with personal epistemological knowledge was carried out. Another study carried out in Nigeria examined the relationship between the three dimensions of epistemological beliefs (simple knowledge, certainty of knowledge, quick learning) and learning goal orientation in the prediction of deep knowledge acquisition approach among teacher candidates [40].

When examining the research on the epistemological beliefs of social studies teacher candidates, it is seen that there are several studies: One study examines the relationship between the epistemological beliefs of teacher candidates and the educational philosophies they adopt, considering various variables [17]; another study aims to determine the epistemological beliefs of social studies teacher candidates based on variables such as the university they attend, gender, grade level, and the high school they graduated from [41]; and there is a research that aims to determine the epistemological beliefs and information literacy levels of social studies teacher candidates in relation to gender and grade level variables [42].

When examining the literature on locus of control, it has been found that Yanılmaz (1999) examined teacher candidates' locus of control in relation to variables such as gender, academic department attended, academic achievement level, family's socioeconomic status, and place of

residence. According to the findings of the study it was observed that males tend to have a higher internal locus of control compared to women. However, there were no statistically significant differences based on variables such as academic department attended, academic achievement level, family's socioeconomic status, and place of residence [43]. In addition, Uğur (2021) conducted a study to examine whether the locus of control levels of university students residing in the Credit and Dormitories Institution vary based on demographic characteristics. It was found in the study that the locus of control levels of the participating students was below average. While there were no significant differences based on variables such as gender, age, faculty/college/vocational school attended, grade, duration of stay in the credit dormatories, parents' educational levels, father's occupation, mother's employment status, and monthly family income, there was a significant difference regarding the environment in which they grew up and that participants had levels of internal locus of control [44].

In the literature, the locus of control of teacher candidates has been studied in relation to various variables. These variables include the following: language performance [45]; academic self-concept and academic performance [46]; optimistic tendency [47]; learning approaches [48]; decision-making styles [49]; self-efficacy beliefs [50]; aggression and multidimensional perfectionism [51]; critical thinking attitudes [52]; human values [53]; attitudes towards teaching profession [54]; metacognitive learning strategies [55]; learned powerfulness as predictor of self-leadership [56]; problem-solving skill [57]; education philosophy [58]; interpersonal problem-solving approaches [59]; academic self-efficacy [60].

Regarding social studies teacher candidates, there is a study that examines the relationship between the locus of control and global social responsibility levels of history and social studies teacher candidates [61].

When examining the studies that discuss locus of control and epistemological beliefs together, it is found that there are various studies. For instance, Kıralp, Şahin, and Dinçyürek (2008) examined the locus of control and epistemological beliefs of different psychological counseling and guidance students in terms of gender, age, nationality, and grade level [62]. Another study aimed to determine whether there is a relationship between students' locus of control and epistemological beliefs, and the criteria they use during the evaluation process of comprehending information in a printed instructional material based on program type and grade levels [63]. Additionally, study has been conducted to investigate the relationship between nursing students' epistemological beliefs and locus of control [64].

In the development of epistemological beliefs, several factors can influence them, including age, gender, education, family structure, culture, parents' educational level, locus of control, place of residence, field of study, and cognitive development (intelligence) [2,6,23,25,35,65–70]. One of the factors that affect students' epistemological beliefs is locus of control, which is among the individual characteristics. Research has shown that locus of control can be measured and evaluated as a functional personality dimension in many situations, and this construct has become one of the fundamental variables in personality research [11,25].

Collins states that individuals have different beliefs in their lives, and these diverse beliefs influence whether they are individuals with internal or external locus of control in a particular matter. Wilkinson and Schwartz found in their study that individuals with advanced epistemological beliefs had higher levels of verbal abilities and were more oriented towards internal locus of control [9,71,72].

Based on these research findings, it can be stated that it is important to educate teacher candidates as individuals with advanced epistemological beliefs and an internal locus of control because they will raise the future citizens. Indeed, it is known that epistemological beliefs and internal locus of control have a significant impact on individuals' thoughts and behaviors; raising individuals with advanced epistemological beliefs and an internal locus of control in the educational process is of great importance for achieving the ideal of a democratic society. "Becoming a teacher holds invaluable importance in developing the competencies of future citizens and thus making a significant contribution to addressing future societal issues" [73]. Therefore, there is a greater need for studies that determine the levels of epistemological beliefs and locus of control among teacher

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candidates, that identify whether there is a relationship between these factors, and that provide recommendations for addressing the identified issues. Within this context, the aim of this study is to examine the social studies teacher candidates' locus of control and epistemological beliefs and to determine the relationship between these two variables. Within this main objective, the study sought answers to the following research questions:

What are the social studies teacher candidates' levels of locus of control and epistemological beliefs?

Do the social studies teacher candidates' locus of control and epistemological beliefs differ regarding gender?

Do the social studies teacher candidates' locus of control and epistemological beliefs differ regarding their parents' educational level?

Do the social studies teacher candidates' locus of control and epistemological beliefs differ regarding their grade levels?

Is there a relationship between the locus of control and epistemological beliefs of social studies teacher candidates?

2. Materials and Methods

2.1. Method

This research was conducted using the survey research model, which is one of the quantitative research designs. Survey research examines characteristics of individuals such as beliefs, attitudes, opinions, and tendencies. Additionally, survey research can test whether these characteristics of individuals vary across different variables. Alternatively, in research, multiple characteristics can be discussed, and the relationships between them can be explored. In other words, survey research can be conducted for the purposes of identification, explanation, and prediction. Within survey studies, there are subcategories such as general survey, causal comparative, and correlational research. General survey research is primarily descriptive in nature and aims to determine the status of individuals regarding specific topics. In these types of studies, data is often reported using descriptive statistics such as mean, frequency, percentage, and mode. In causal comparative research, the independent variable has a categorical structure (in nominal scale) and is referred to as the grouping variable. In other words, the aim is to determine whether there are significant differences in the scores of the individuals in different categories of the independent variable on the dependent variable. Although causal comparative research is named as such, the findings obtained from this type of research do not provide evidence for causality. Therefore, considering the labelling of the research, it is important not to be mistaken about interpreting the findings solely based on the cause-effect relationship. In correlational research, the aim is to determine the relationship between two or more quantitative variables. Within this context, measurements of the variables under investigation are obtained from the participants in the sample. Subsequently, benefitting from appropriate analyses, the direction and strength of the relationship between the variables are revealed. In addition, when one of the variables is defined as the dependent variable and others are defined as independent variables, the predictive power of the independent variable on the dependent variable or the independent variable(s) can be examined. In addition to this, as in causal comparative research, it is important to note that correlational research findings should not be interpreted as establishing a cause-and-effect relationship [74].

2.2. Participants

The study consists of a total of 550 social studies teacher candidates enrolled in 7 state universities located in 7 geographical regions in Turkey. 700 teacher candidates participated in the research; however, 127 teacher candidates had incomplete responses on the scales, and 23 teacher candidates provided extreme values on the scales, so they were not included in the study.

The participants of the study were selected using a multi-stage sampling method. The process of sampling from the population was completed in two stages. In this research, the population was

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defined as all state universities in Turkey. In the first stage, cluster sampling was employed, and 7 state universities, one from each geographical region, were selected randomly. In the second stage, simple random sampling was employed, and a predetermined number of teacher candidates were selected from each grade level (1st, 2nd, 3rd, and 4th year). The demographic information of the participants is provided in Table 1.

Table 1. Demographic Characteristics of the Teacher Candidates.

Variable	Group	f	%
Gender	Male	158	28,7
	Female	392	71,3
Grade **Level**	1st Year	133	24,2
	2nd Year	158	28,7
	3rd Year	130	23,6
	4th Year	129	23,5
Mother's Educational Level	Unable to read or write	58	10,5
	Elementary School	234	42,5
	Secondary School	130	23,6
	High School	98	17,8
	Associate degree	6	1,1
	Undergraduate degree	20	3,6
	Graduate degree	4	0,4
Father's Educational Level	Unable to read or write	10	1,8
	Elementary School	166	30,2
	Secondary School	157	28,5
	High School	123	22,4
	Associate degree	24	4,4
	Undergraduate degree	57	10,4
	Graduate degree	13	2,4
Total		550	100

Table 1 presents the distribution of variables regarding the gender, grade level, and parental education status of teacher candidates. According to this distribution, it is observed that 28.7% (158 individuals) of teacher candidates are male, while 71.3% (392 individuals) are female.

When looking at the grade levels of teacher candidates, it is observed that 24.2% (133 individuals) are in their 1st year, 28.7% (158 individuals) are in their 2nd year, 23.6% (130 individuals) are in their 3rd year, and 23.5% (129 individuals) are in their 4th year of university.

When examining the parents' educational levels of teacher candidates, it is observed that among parents who cannot read or write, 10.5% (58 individuals) are mothers and 1.8% (10 individuals) are fathers. Among parents who are elementary school graduates, 42.5% (234 individuals) are mothers and 30.2% (166 individuals) are fathers. Among parents who are secondary school graduates, 23.6% (130 individuals) are mothers and 28.5% (157 individuals) are fathers. Among parents who graduated from high school, 17.8% (98 individuals) are mothers and 22.4% (123 individuals) are fathers. Among parents who have obtained associate degree, 1.1% (6 individuals) are mothers and 4.4% (24 individuals) are fathers. Among parents who have completed undergraduate studies, 3.6% (20 individuals) are mothers and 10.4% (57 individuals) are fathers. Finally, among parents who have completed graduate studies, 0.4% (4 individuals) are mothers and 2.4% (13 individuals) are fathers.

2.3. Data Collection Tools

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This study utilized data collection instruments including the "Locus of Control Scale (LCS)" developed by Dağ (2002) and the "Epistemological Beliefs Scale" developed by Shommer (1990) and tested by Deryakulu and Büyüköztürk regarding its validity and reliability.

2.3.1. Locus of Control Scale

In the initial stage of the scale developed by Dağ (2002), the sample consisted of 272 voluntary participants from the departments of Psychology, Philosophy, Physics Engineering, and Chemistry Engineering at Hacettepe University. Of the participants, 173 were female, 99 were male, and the mean age was 21.1. The initial item pool of the Locus of Control Scale (LCS) included 42 items from the Turkish adaptation of Rotter's scale, called Rotter's Internal-External Locus of Control Scale (RİDKOÖ). The other items that comprised the pool were obtained, either unchanged or with modifications, from 8 different scales developed by other researchers. Two original items by Dağ were also included in the scale. When composing the scale items, the 5-point Likert format was used to answer the questions. Based on the item-total correlations and item analysis comparing extreme groups, 33 items were removed from the scale. The internal consistency of the remaining 47 items in the scale was found to be.91. In the second stage of the study, the sample consisted of 111 voluntary participants from the Department of Psychology at Hacettepe University. Of the participants, 87 were female, 24 were male, and the mean age was 20.7. Cronbach's alpha internal consistency coefficient of the LCS (Locus of Control Scale) consisting of 47 items was found as .92. While 25 items in the scale were positively scored, 22 of them were reverse scored items. Thus, this approach helped to mitigate response bias. The scale items were created in such a way that they could be answered using a 5-point Likert scale format. The response options for the scale are as follows: "not appropriate at all" (1), "not very appropriate" (2), "moderately appropriate" (3), "quite appropriate" (4), and "completely appropriate" (5). The scale consists of 18 items that measure internal locus of control and the other 4 sub-scales consisting of 29 items measure external locus of control. Higher scores on the scale indicate higher external locus of control, while lower scores indicate higher internal locus of control [75]. In this study, the Cronbach's alpha value of the LCS was found as .77.

2.3.2. Epistemological Beliefs Scale

The scale developed by Shommer (1990) was translated into Turkish by Deryakulu and Büyüköztürk (2002) who also carried out the validity, and reliability studies of the scale. Initially, the original scale, consisting of 63 items in English, was translated into Turkish, ensuring item equivalence. Then the scale was administered to a total of 595 students enrolled in various departments of Faculties of Education, Communication, Letters, and Engineering at four state universities. Of the 595 students, 47.2% were female and 52.8% were male. The mean age was 21. Factor analysis was conducted to determine the factor structure of the scale, resulting in the removal of 28 items from the scale. Factor analysis was administered to the remaining 35 items, and it was found that the scale could be divided into three independent factors. Due to the differences in factor structure exhibited by the scale in Turkish culture compared to the original scale, new names were given to the factors. The first factor, consisting of 18 items, was identified as "Belief that Learning Depends on Effort." The second factor, consisting of 8 items, was identified as "Belief that Learning Depends on Talent". The third factor, comprising 9 items, was determined as "Belief that There is Only One Correct Knowledge." Cronbach's alpha internal consistency coefficients calculated for the reliability of the scale was found as follows: .83 for the first factor, .62 for the second factor, .59 for the third factor, and .71 for the entire scale. The first two factors in the scale measure beliefs about learning, while the third factor measures beliefs related to knowledge [76].

Deryakulu and Büyüköztürk (2005) conducted a study with a total of 626 students (majoring in Computer and Instructional Technologies Teaching, Elementary School Teaching, and Social Studies Teaching) to re-examine the factor structure of the Epistemological Belief Scale. Due to the low correlation of the 24th item with its factor, it was decided to exclude it from the scale through confirmatory factor analysis (CFA) administered in the study. It was found that the 10th item, which was initially included in the first factor, exhibited compatibility with the second factor and it was

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suggested that it could be included in the second factor. As a result of the confirmatory factor analysis (CFA) reapplied to assess the validity of the scale's three-factor structure consisting of 34 items, the calculated ratio was found as 2.54. This value indicates that the tested factorial model is consistent with the data. The scale items were created in a 5-point Likert scale format for response options. These response options include the following: "strongly disagree" (1), "disagree" (2), "neutral" (3), "agree" (4), "strongly agree" (5). A high score obtained from each dimension of the scale indicates the presence of underdeveloped/immature epistemological beliefs, while a low score indicates the presence of developed /mature /advanced epistemological beliefs. [77]. In this study, the Cronbach's alpha value of the epistemological belief scale was found to be .76.

2.4. Statistical Analyses

The SPSS 22 statistical package program was used for data analysis. Descriptive statistics, independent samples t-test, one-way analysis of variance (ANOVA), and Pearson correlation coefficient were administered for the analysis of the data obtained in the study. Before carrying out the statistical analyses of the obtained data, normality test was used to determine if a data set followed a normal distribution. In this context, skewness and kurtosis values were examined. For normality, the skewness and kurtosis values should be less than ±1 standard deviation [78,79]. However, as the sample size increases, it is often considered acceptable for skewness and kurtosis values to be within the range of ±2 for normal distribution [80,81]. Based on the analysis results, it was found that the skewness and kurtosis values of the total scores of the Locus of Control and Epistemological Belief scales are within the range of ±1; the skewness and kurtosis values of the sub-scales of the scales are within the range of ±2. Based on these findings, it was decided to use parametric tests for data analysis, and a 0.05 level of significance was adopted as the basis for interpreting the data.

The demographic characteristics of the teacher candidates that compose the study group (gender, parents' educational level, and grade level) were analyzed using descriptive statistics (frequency and percentage distributions). Descriptive statistics (minimum and maximum scores, mean, and standard deviation) of the scores obtained by the teacher candidates from the Locus of Control Scale and Epistemological Belief Scale were calculated. To determine whether there were significant differences in the scores obtained by the teacher candidates from the Locus of Control Scale and Epistemological Belief Scale regarding variable of gender, an independent samples t-test was used. Additionally, the one-way analysis of variance (ANOVA) was applied to determine if there were significant differences in the scores regarding the variables of grade level and parents' educational levels. The Scheffe test, a post-hoc analysis, was used to determine the differences after executing the Anova analysis. The Scheffe test is preferred when there is a variance equality comparing multiple groups and when the sample sizes are different in the groups [82]. In this study, the Scheffe test was adopted due to the equal variances in the groups and the unequal sample sizes in the groups. Pearson correlation analysis was used to evaluate the relationship between the locus of control and epistemological beliefs.

3. Results

3.1. Results Related to the First Sub-Problem

The first sub-problem of the study is defined as "What are social studies teacher candidates' levels of locus of control and epistemological beliefs?" Descriptive statistics were carried out for the data obtained from the teacher candidates' locus of control and its sub-scales, and epistemological beliefs and its sub-scales. The analysis results including the lowest and highest scores, arithmetic mean, and standard deviation values obtained by the teacher candidates from both scales and their sub-scales were presented in Table 2.

Table 2. Teacher Candidates' Levels of Locus of Control and Epistemological Beliefs.

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Dimension	Lowest	Highest	Mean	SS.
Locus of Control	2,30	4,21	3,25	,34
Individual Control	1,17	5,00	3,17	,61
Belief in Chance	1,36	4,82	3,15	,47
Meaninglessness of the Effortfulness	2,00	4,90	3,43	,48
Belief in Fate	1,00	5,00	2,84	,81
Belief in an Unjust World	1,40	5,00	3,62	,72
Epistemological Belief	3,03	4,77	3,85	,31
Belief that Learning Depends on Effort	3,00	4,89	4,06	,35
Belief that Learning Depends on Talent	2,11	5,00	3,68	,57
Belief that There is Only One Correct Knowledge	2,63	4,88	3,58	,43

Upon examining Table 2, it can be observed that the arithmetic mean of the scores obtained by teacher candidates on the locus of control scale is 3.25, with a standard deviation of 0.34. Upon examining Table 2, it can be observed that the arithmetic mean of the scores obtained by teacher candidates on the locus of control scale is (X=3,25), with a standard deviation of (SS=,34). It can be stated that teacher candidates generally responded to the items in the locus of control scale at an "appropriate" level. When examining the arithmetic mean scores obtained from the sub-scales of locus of control, it is seen that the highest mean score (3.62) is in the sub-scale of belief in an unjust world. In this context, it can be stated that teacher candidates exhibit a higher level of external locus of control in the sub-scale of belief in an an unjust world.

It is seen that the arithmetic mean scores of the teacher candidates obtained from epistemological beliefs scale is 3.85 and the standard deviation is 0.31. It can be stated that teacher candidates generally responded to the items in the epistemological beliefs scale at a "agree" level. Upon examining the arithmetic mean scores obtained by the teacher candidates from the sub-scales of epistemological belief, it is seen that the highest mean score (4.06) is related to the belief that learning depends on effort. In this context, it can be stated that teacher candidates have an underdeveloped / immature epistemological beliefs in the sub-scale of belief that learning learning depends on effort.

3.2. Results Related to the Second Sub-Problem

The second sub-problem of the study is defined as "Do the social studies teacher candidates' locus of control and epistemological beliefs differ regarding gender?" The results of the independent samples t-test administered to determine whether there are differences in the mean scores of teacher candidates on the locus of control scale and its sub-scales as well as the epistemological belief scale and its sub-scales regarding the gender variable were presented in Table 3 and Table 4.

Table 3. Analysis of Teacher Candidates' Locus of Control Regarding Gender Variable.

Scale and Dimensions	Gender	N	X	SS	sd	t	p
Locus of Control	Male	158	3,22	,36	548	-1,075	,283
	Female	392	3,26	,34			
Individual Control	Male	158	3,18	,62	548	,216	,829
	Female	392	3,17	,60			
Belief in Chance	Male	158	3,13	,48	548	-,854	,393

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	Female	392	3,17	,47			
Meaninglessness of the Effortfulness	Male	158	3,40	,49	548	-,805	,421
	Female	392	3,44	,48			
Belief in Fate	Male	158	2,92	,87	548	1,377	,169
	Female	392	2,81	,78			
Belief in an Unjust World	Male	158	3,42	,71	548	-4,259	,000*
	Female	392	3,71	,70			

*p<0.05

Upon examining Table 3, it is observed that there is no significant difference in the teacher candidates'mean scores in the locus of control scale and its sub-scales of individual control, belief in chance, and meaninglessness of effortfulness based on the gender variable. A significant difference was observed in the sub-scale of belief in an unjust world of the locus of control scale (t = -4.259, p < 0.05). It was observed that female teacher candidates had higher mean scores in the sub-scales of belief in chance, meaninglessness of effortfulness, and belief in an unjust world. Thus, it can be stated that female teacher candidates a had higher external locus of control.

Table 4. Analysis of Teacher Candidates' Epistemological Beliefs Regarding Gender Variable.

Scale and Dimensions	**Gender**	**N**	**X**	**SS**	**sd**	**t**	**p**
Epistemological Beliefs	Male	158	3,76	,30	548	-4,116	,000*
	Female	392	3,89	,31			
Belief that Learning Depends on Effort	Male	158	3,99	,35	548	-2,930	,004*
	Female	392	4,08	,35			
Belief that Learning Depends on Talent	Male	158	3,57	,58	548	-3,100	,002*
	Female	392	3,73	,55			
Belief that There is Only One Correct Knowledge	Male	158	3,49	,43	548	-3,091	,002*
	Female	392	3,62	,42			

*p<0.05

When Table 4 was examined, it was observed that there was a significant difference based on the gender variable in the teacher candidates' mean scores in the epistemological beliefs scale (t(548)=) -4.116, p < 0.05. It was determined that female teacher candidates had higher arithmetic means from the epistemological beliefs scale and its sub-scales. Therefore, female teacher candidates had underdeveloped/ immature epistemological beliefs.

3.3. Results Related to the Third Sub-Problem

The third sub-problem of the study constituted the question "Do the social studies teacher candidates' locus of control and epistemological beliefs differ regardimg their parents' educational level?" The results of the one-way analysis of variance (ANOVA) applied to determine whether there

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are differences in the mean scores of teacher candidates on the locus of control scale and its sub-scales as well as the epistemological belief scale and its sub-scales regarding the variable of parents' educational levels were presented in Table 5, Table 6, Table 7, and Table 8.

Table 5. Analysis of Teacher Candidates' Locus of Control Regarding Mother's Educational Level.

Dimension	Educational Level	N	X	Source of Variation	Total Sum of Squares	sd	Mean Square	F	p
Locus of Control	Unable to read or write								
	Elementary School	58	3,27	Intergroup	,965	6	,161	1,318	,247
	Secondary School	234	3,27	Intragroup	66,240	543	,122		
	High School	130	3,23	Total	67,205	549			
	Associate degree	98	3,25						
	Undergraduate degree	6	2,95						
	Graduate degree	20	3,13						
	Total	4	3,23						
		550	3,25						
Individual Control	Unable to read or write								
	Elementary School	58	3,15	Intergroup	1,990	6	,332	,879	,510
	Secondary School	234	3,20	Intragroup	204,888	543	,377		
	High School	130	3,16	Total	206,878	549			
	Associate degree	98	3,18						
	Undergraduate degree	6	2,75						
	Graduate degree	20	3,01						
	Total	4	2,97						
		550	3,17						
Belief in Chance	Unable to read or write								
	Elementary School	58	3,23	Intergroup	2,295	6	,383	1,679	,124
	Secondary School	234	3,18	Intragroup	123,745	543	,228		
	High School	130	3,10	Total	126,040	549			
	Associate degree	98	3,16						
	Undergraduate degree	6	2,71						
	Graduate degree	20	3,11						
	Total	4	3,34						
		550	3,15						
Meaninglessness of the Effortfulness	Unable to read or write								
	Elementary School	58	3,48	Intergroup	,521	6	,087	,364	,902
	Secondary School	234	3,43	Intragroup	129,501	543	,238		
	High School	130	3,41	Total	130,021	549			
	Associate degree	98	3,44						
	Undergraduate degree	6	3,35						
	Graduate degree	20	3,34						
	Total	4	3,55						
		550	3,43						

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Belief in Fate	Unable to read or write								
	Elementary School	58	2,92	Intergroup	5,093	6	,849	1,295	,258
	Secondary School	234	2,88	Intragroup	356,048	543	,656		
	High School	130	2,82	Total	361,141	549			
	Associate degree	98	2,71						
	Undergraduate degree	6	3,27						
	Graduate degree	20	2,75						
	Total	4	3,41						
		550	2,84						
Belief in an Unjust World	Unable to read or write								
	Elementary School	58	3,61	Intergroup	2,408	6	,401	,771	,593
	Secondary School	234	3,63	Intragroup	282,830	543	,521		
	High School	130	3,67	Total	285,238	549			
	Associate degree	98	3,64						
	Undergraduate degree	6	3,26						
	Graduate degree	20	3,44						
	Total	4	3,25						
		550	3,62						

*p<0.05

Table 6. Analysis of Teacher Candidates' Epistemological Beliefs Regarding Mother's Educational Level.

Dimension	Educational Level	N	X	Source of Variation	Total Sum of Squares	sd	Mean Square	F	p
Epistemological Beliefs	Unable to read or write								
	Elementary School	58	3,87	Intergroup	,650	6	,108	1,075	,376
	Secondary School	234	3,82	Intragroup	54,700	543	,101		
	High School	130	3,88	Total	55,350	549			
	Associate degree	98	3,88						
	Undergraduate degree	6	3,67						
	Graduate degree	20	3,82						
	Total	4	3,77						
		550	3,85						
Belief that Learning Depends on Effort	Unable to read or write								
	Elementary School	58	4,04	Intergroup	,493	6	,082	,646	,693
	Secondary School	234	4,05	Intragroup	69,097	543	,127		
	High School	130	4,08	Total	69,590	549			
	Associate degree	98	4,07						
	Undergraduate degree	6	3,91						
	Graduate degree	20	3,97						
	Total	4	3,94						
		550	4,06						

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Belief that Learning Depends on Talent	Unable to read or write								
	Elementary School	58	3,77	Intergroup	2,907	6	,484	1,494	,178
	Secondary School	234	3,63	Intragroup	176,059	543	,324		
	High School	130	3,68	Total	178,965	549			
	Associate degree	98	3,79						
	Undergraduate degree	6	3,42						
	Graduate degree	20	3,65						
	Total	4	3,88						
		550	3,68						
Belief that There is only one Correct Knowledge	Unable to read or write								
	Elementary School	58	3,63	Intergroup	1,710	6	,285	1,525	,167
	Secondary School	234	3,55	Intragroup	101,444	543	,187		
	High School	130	3,64	Total	103,154	549			
	Associate degree	98	3,56						
	Undergraduate degree	6	3,39						
	Graduate degree	20	3,68						
	Total	4	3,28						
		550	3,58						

*p<0.05

Table 7. Analysis of Teacher Candidates' Locus of Control Regarding Father's Educational Level.

Dimension	**Educational Level**	**N**	**X**	**Source of Variation**	**Total Sum of Squares**	**sd**	**Mean Square**	**F**	**p**
Locus of Control	Unable to read or write	10	3,32	Intergroup	1,222	6	,204	1,677	,124
	Elementary School	166	3,22	Intragroup	65,982	543	,122		
	Secondary School	157	3,31	Total	67,205	549			
	High School	123	3,24						
	Associate degree	24	3,17						
	Undergraduate degree	57	3,19						
	Graduate degree	13	3,34						
	Total	550	3,25						

Individual Control	Unable to read or write	10	3,33	Intergroup	4,357	6	,726	1,947	,071
	Elementary School	166	3,12	Intragroup	202,521	543	,373		
	Secondary School	157	3,28	Total	206,878	549			
	High School	123	3,14						
	Associate degree	24	2,90						
	Undergraduate	57	3,16						
	degree	13	3,24						
	Graduate degree	550	3,17						
	Total								
Belief in Chance	Unable to read or write	10	3,27	Intergroup	,924	6	,154	,668	,675
	Elementary School	166	3,11	Intragroup	125,116	543	,230		
	Secondary School	157	3,19	Total	126,040	549			
	High School	123	3,16						
	Associate degree	24	3,16						
	Undergraduate	57	3,11						
	degree	13	3,27						
	Graduate degree	550	3,15						
	Total								
Meaninglessness of the Effortfulness	Unable to read or write	10	3,42	Intergroup	,621	6	,103	,434	,856
	Elementary School	166	3,43	Intragroup	129,400	543	,238		
	Secondary School	157	3,45	Total	130,021	549			
	High School	123	3,42						
	Associate degree	24	3,48						
	Undergraduate	57	3,34						
	degree	13	3,48						
	Graduate degree	550	3,43						
	Total								
Belief in Fate	Unable to read or write	10	2,26	Intergroup	6,821	6	1,134	1,742	,109
	Elementary School	166	2,87	Intragroup	354,321	543	,653		
	Secondary School	157	2,83	Total	361,141	549			
	High School	123	2,86						
	Associate degree	24	2,73						
	Undergraduate	57	2,64						
	degree	13	3,25						
	Graduate degree	550	2,84						
	Total								

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Belief in an Unjust World	Unable to read or write	10	3,30	Intergroup	3,348	6	,558	1,075	,376
	Elementary School	166	3,58	Intragroup	281,890	543	,519		
	Secondary School	157	3,67	Total	285,238	549			
	High School	123	3,64						
	Associate degree	24	3,83						
	Undergraduate	57	3,52						
	degree	13	3,66						
	Graduate degree	550	3,62						
	Total								

*p>0.05

Table 8. Analysis of Teacher Candidates' Epistemological Beliefs Regarding Father's Educational Level.

Dimension	Educational Level	N	X	Source of Variation	Total Sum of Squares	sd	Mean Square	F	p
Epistemological Beliefs	Unable to read or write	10	3,80	Intergroup	,358	6	,060	,589	,739
	Elementary School	166	3,88	Intragroup	54,993	543	,101		
	Secondary School	157	3,85	Total	55,350	549			
	High School	123	3,82						
	Associate degree	24	3,86						
	Undergraduate	57	3,87						
	degree	13	3,76						
	Graduate degree	550	3,85						
	Total								
Belief that Learning Depends on Effort	Unable to read or write	10	3,88	Intergroup	,647	6	,108	,850	,532
	Elementary School	166	4,09	Intragroup	68,943	543	,127		
	Secondary School	157	4,04	Total	69,590	549			
	High School	123	4,05						
	Associate degree	24	4,00						
	Undergraduate	57	4,06						
	degree	13	4,00						
	Graduate degree	550	4,06						
	Total								

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Belief that Learning Depends on Talent	Unable to read or write	10	3,71	Intergroup	1,563	6	,260	,797	,572
	Elementary School	166	3,69	Intragroup	177,403	543	,327		
	Secondary School	157	3,69	Total	178,965	549			
	High School	123	3,61						
	Associate degree	24	3,86						
	Undergraduate	57	3,73						
	degree	13	3,68						
	Graduate degree	550	3,68						
	Total								
Belief that There is only one Correct Knowledge	Unable to read or write	10	3,71	Intergroup	1,371	6	,229	1,219	,295
	Elementary School	166	3,61	Intragroup	101,782	543	,187		
	Secondary School	157	3,58	Total	103,154	549			
	High School	123	3,55						
	Associate degree	24	3,58						
	Undergraduate	57	3,60						
	degree	13	3,31						
	Graduate degree	550	3,58						
	Total								

*p>0.05

When Table 5, Table 6, Table 7, and Table 8 were examined, it was observed that there was no significant difference in terms of the teacher candidates' mean scores in the locus of control scale and its sub-scales, as well as the epistemological belief scale and its sub-scales regarding the variable of parents' educational level. The findings indicated that teacher candidates with different parental educational levels have similar levels of locus of control and epistemological beliefs.

3.4. Results Related to the Fourth Sub-Problem

The fourth sub-problem of the study constituted the question "Do the social studies teacher candidates' locus of control and epistemological beliefs differ regarding their grade levels?" The results of the one-way analysis of variance (ANOVA) executed to determine whether there were differences in the mean scores of teacher candidates in the locus of control scale and its sub-scales as well as the epistemological beliefs scale and its sub-scales regarding the variable of grade levels were presented in Table 9 and Table 10.

Table 9. Analysis of Teacher Candidates' Level of Locus of Control Regarding the Variable of Grade Level.

Scale Dimensions	Grade Level	N	X	Source of Variation	Total Sum of Squares	sd	Mean Squares	F	p Difference
Locus of Control	1st Year	133	3,26	Intergroup	,443	3	,148	1,20	,307
	2ndYear	158	3,26	Intragroup	66,762	546	,122	7	-
	3rd Year	130	3,20	Total	67,205	549			
	4th Year	129	3,27						
	Total	550	3,25						

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Individual Control	1st Year	133	3,09	Intergroup	1,332	3	,444	1,17	,317	
	2ndYear	158	3,20	Intragroup	205,547	546	,376	9	-	
	3rd Year	130	3,16	Total	206,878	549				
	4th Year	129	3,22							
	Total	550	3,17							
Belief in Chance	1st Year	133	3,22	Intergroup	1,398	3	,466	2,04	,107	
	2ndYear	158	3,16	Intragroup	124,642	546	,228	1	-	
	3rd Year	130	3,07	Total	126,040	549				
	4th Year	129	3,17							
	Total	550	3,15							
Meaninglessness of the Effortfulness	1st Year	133	3,45	Intergroup	,213	3	,071	,299	,826	
	2ndYear	158	3,41	Intragroup	129,808	546	,238		-	
	3rd Year	130	3,40	Total	130,021	549				
	4th Year	129	3,45							
	Total	550	3,43							
Belief in Fate	1st Year	133	2,94	Intergroup	2,533	3	,844	1,28	,278	
	2ndYear	158	2,80	Intragroup	358,608	546	,657	6	-	
	3rd Year	130	2,88	Total	361,141	549				
	4th Year	129	2,77							
	Total	550	2,84							
Belief in an Unjust World	1st Year	133	3,75	Intergroup	10,222	3	3,407	6,76	,000	
	2ndYear	158	3,70	Intragroup	275, 015	546	,504	5	1>3	
	3rd Year	130	3,39	Total	285,238	549				
	4th Year	129	3,64							
	Total	550	3,62							

*p<0.05

When Table 9 was examined, it was found that there was a significant difference in the teacher candidates'mean scores from the sub-scale of belief in an unjust world in the locus of control scale regarding the variable of grade level (F(3-546)= 6,765, p<0.05). It was determined that the calculated effect size of the test was η^2=0.035. In order to identify the source of the significant difference, a test for homogeneity was applied, and it was found that the variances were equal (Sig.=,324>0.05). In this case, the results of the Scheffe test used to test multiple comparison indicates that the significant difference in the mean scores of teacher candidates is due to the relationship between the 1st-year and 3rd-year teacher candidates. It has been determined that 1st-year teacher candidates have higher arithmetic mean scores compared to 3rd-year teacher candiates. Based on the findings, it can be stated that 1st-year teacher candiates have a higher level of external locus of control compared to 3rd-year teacher candidates.

Table 10. Analysis of Teacher Candidates' Epistemological Beliefs Regarding the Variable of Grade Level.

Scale and Dimensions	Grade Level	N	X	Source of Variation	Total Sum of Squares	sd	Mean Squares	F	p

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Epistemological Beliefs	1st Year	133	3,84	Intergroup	,026	3	,009	,084	,969
	2ndYear	158	3,86	Intragroup	55,325	546	,101		
	3rd Year	130	3,85	Total	55,350	549			
	4th Year	129	3,85						
	Total	550	3,85						
Belief that Learning Depends on Effort	1st Year	133	4,04	Intergroup	,230	3	,077	,604	,613
	2ndYear	158	4,08	Intragroup	69,360	546	,127		
	3rd Year	130	4,03	Total	69,590	549			
	4th Year	129	4,06						
	Total	550	4,06						
Belief that Learning Depends on Talent	1st Year	133	3,66	Intergroup	,249	3	,083	,254	,858
	2ndYear	158	3,68	Intragroup	178,716	546	,327		
	3rd Year	130	3,67	Total	178,965	549			
	4th Year	129	3,72						
	Total	550	3,68						
Belief that There is only one Correct Knowledge	1st Year	133	3,61	Intergroup	1,155	3	,385	2,06	,104
	2ndYear	158	3,56	Intragroup	101,998	546	,187	2	
	3rd Year	130	3,64	Total	103,154	549			
	4th Year	129	3,51						
	Total	550	3,58						

*p<0.05

Upon examining Table 10, it is seen that there is no significant difference in the mean scores of pre-service teachers on the epistemological belief scale and its sub-scales regarding the variable of grade level. The findings indicated that the epistemological beliefs of teacher candidates did not significantly differ according to the grade levels. In other words, it shows that teacher candidates from different grade levels have a similar level of epistemological beliefs.

3.5. Results Related to the Fifth Sub-Problem

The fifth sub-problem of the study included the question "Is there a relationship between the locus of control and epistemological beliefs of social studies teacher candidates?" The results of the Pearson correlation analysis applied to determine whether there is a relationship between the scores of pre-service teachers on the locus of control scale and its sub-scales as well as the epistemological belief scale and its sub-scales were presented in Table 11.

Table 11. Pearson Correlation Analysis of the Relationship Between the Locus of Control and Epistemological Beliefs.

	X	Sd	1	2	3	4	5	6	7	8	9
1.Locus of Control	3,25	,34	1								
2.Individual Control	3,17	,61	,72**	1							
3. Belief in Chance	3,15	,47	,68**	,24**	1						
4. Meaninglessness of the Effortfulness	3,43	,48	,58**	,06	,36**	1					
5. Belief in Fate	2,84	,81	,10*	-,28**	,17**	,20**	1				

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6.Belief in an Unjust World	3,62	,72	,47**	-,00	,30**	,46**	,16**	1			
7.Epistemological Belief	3,85	,31	,35**	,30**	,17**	,18**	-,11**	,24**	1		
8.Belief that Learning Depends on Effort	4,06	,35	,26**	,23**	,11**	,16**	-,10*	,17**	,82**	1	
9. Belief that Learning Depends on Talent	3,68	,57	,34**	,27**	,20**	,17**	-,04	,24**	,70**	,29**	1
10. Belief that There is Only One Correct Knowledge	3,58	,43	,12**	,13**	,05	,03	-,10*	,10*	,63**	,36**	,23**

**p<0.01; p<0.05

The correlation relationship between the variables was shown in Table 11. When the findings were examined in terms of the locus of control scale and its sub-scales, the following relationships were observed: There is a positive and high-level significant relationship between the dimension of locus of control (H1) and its sub-scales (individual control (r=0.72, p<0.01); there is a positive and moderately significant relationship between the locus of control dimension and the sub-scales of belief in chance (r=0.68, p<0.01) and meaninglessness of the effortfulness (r=0.58, p<0.01), and there is a positive and weak significant relationship between the locus of control dimension and the other sub-scales (belief in chance (r=0.10, p<0.01) and belief in an unjust world (r=0.47, p<0.01).

When the findings were examined in terms of epistemological beliefs and its sub-scales, the following relationships were identified: There is a positive and highly significant relationship between the epistemological beliefs and its sub-scales (belief that learning depends on effort (r=0.82, p<0.01) and belief that learning depends on talent (r=0.70, p<0.01) and there is a positive and moderately significant relationship between the epistemological belief and its another sub-scale (belief that there is only one correct knowledge (r=0.63, p<0.01).

When the findings were examined in terms of the relationship between the teacher candidates' locus of control and epistemological beliefs, a positive and weak significant relationship (r=0.35, p<0.01) was found between the locus of control and epistemological beliefs.

It was observed that there is a positive and very weak significant relationship between the locus of control and the sub-scales of epistemological beliefs (belief that learning depends on effort (r=0.26, p<0.01) and the belief that there is only one correct knowledge (r=0.12, p<0.01) and there is a positive and weak significant relationship between the locus of control and another sub-scale of epistemological beliefs (belief that learning depends on talent (r=0.34, p<0.01).

It was seen that there is a positive and weak significant relationship between the epistemological beliefs and the sub-scales of the locus of control (individual control (r=0.30, p<0.01) and there is a positive and very weak significant relationship between epistemological beliefs and the sub-scales of the belief in chance (r=0.17, p<0.01), meaninglessness of the effortfulness (r=0.18, p<0.01), and an unjust world (r=0.24, p<0.01); however, there is a negative and very weak significant relationship between the epistemological beliefs and the sub-scale of belief in fate (r=-0.11, p>0.01).

4. Conclusions and Discussion

The results of this research, which aimed to examine the locus of control and epistemological beliefs of social studies teacher candidates revealed the relationship between these two variables.

It has been determined that social studies teacher candidates generally responded to the items in the locus of control scale as "appropriate". In this context, it can be stated that teacher candidates have a higher level of external locus of control in the sub-scale of belief in an unjust world. It has been revealed that teacher candidates generally responded to the items in the epistemological belief scale as "agree". Considering the sub-scale of belief that learning depends on effort, it can be stated that teacher candidates have underdeveloped /immature epistemological beliefs. In the study conducted by Yordamlı (2020), it was found that social studies teacher candidates have a high level of

epistemological beliefs, a high level of belief that learning depends on effort, a low level of belief that learning depends on talent, but they have the lowest level of belief that there is only one correct knowledge [42]. In the study conducted by Yılmaz and Kaya (2010) regarding students' epistemological beliefs, it was found that their beliefs that learning depends on effort and learning depends on talent were moderately developed. However, their belief that there is only one correct knowledge was found to be less developed when compared to the other two sub-scales [64].

It has been determined that there is no significant difference in the total scores obtained by social studies teacher candidates from the locus of control scale regarding the variable of gender and the mean scores obtained from the sub-scales of locus of control, including individual control, belief in chance, meaninglessness of the effortfulness, and belief in fate. However, a significant difference was observed only in the sub-scale of belief in an unjust world. It has been determined that female teacher candidates have higher arithmetic means in the dimensions of belief in chance, meaninglessness of the effort fulness, and belief in an unjust world. In this context, it can be implied that female teacher candidates have a higher external locus of control. Consistent with our research findings, in the study conducted by Demirtaş-Mutlu Yener (2019), it was observed that there was no significant difference in the teacher candidates' locus of control in total regarding gender. However, it has been determined that the teacher candidates' perceptions regarding the sub-scales of locus of control including meaninglessness of the effortfulness and belief in an unjust world significantly differed based on gender. In the same study, when looking at the arithmetic mean scores in the dimensions of meaninglessness of the effortfulness and belief in an unjust world, it was observed that female teacher candidates obtained lower scores than male teacher candidates. In this context, it can be concluded that female teacher candidates have a lower level of external locus of control in terms of the dimensions of meaninglessness of the effortfulness and belief in an unjust world compared to male teacher candidates [50]. In the study conducted by Mohanty (2021) to investigate gender differences in university students' locus of control, it was concluded that there was no significant difference between the genders in the locus of control scale [10]. In their study, Garipağaoğlu and Güloğlu (2015) found that the teacher candidates' levels of locus of control did not differ based on the gender variable [56]. Kıralp, Şahin, and Dinçyürek (2008) conducted a study and did not find any significant differences in students' locus of control based on their genders. However, it is noteworthy that the mean scores of female students regarding the locus of control were higher than the mean scores of male students [62]. It was found in the study carried out by Yeşilyaprak (1988), that there was no significant difference in terms of gender [83]. In the study conducted by Zembat et al. (2018), it was found that the scores obtained by teacher candidates from the Locus of Control Scale and its sub-scales did not show significant differences based on gender [49]. In the study conducted by Uğur (2021), it was concluded that the students' levels of locus of control were below average. It was also found that there were no differences in participants' locus of control levels based on gender. In his study [44], Eksterowicz (1999) did not find any differences between genders in terms of locus of control [84]. In contrast to these studies, Joe (1971) stated that gender differences influenced individuals' beliefs about locus of control [85]. It has been observed that there is no difference between the teacher candidates' locus of control in terms of many variables. In order to retest this result, comprehensive research can be conducted on larger sample groups that address these variables.

It was observed that there is a significant difference in the epistemological beliefs of social studies teacher candidates based on gender. It was revealed that female teacher candidates had higher arithmetic means in epistemological beliefs and all sub-scales. Consistent with our research findings, Schommer (1993) in her study discussed students' beliefs about the nature of knowledge and learning, in other words, development of their epistemological beliefs and Schommer found that girls exhibited more complex thinking in the dimension of belief that learning depends on effort and that there was no significant difference between the girls and boys in the dimension of belief that there is only one correct knowledge. Additionally, Schommer stated that male students had stronger beliefs in the quick learning of knowledge compared to female students [86].

Schommer (1990), examined students' beliefs about the nature of knowledge and how these beliefs influenced comprehension and as a result, she found that knowledge depends on natural talent, simple knowledge, quick learning, and belief in certainty. Moreover, she stated that gender had a significant impact on these four epistemological factors. In other words, it was concluded that female students think less simple than male students in terms of the belief that "learning depends on talent". This study indicates that female students do not believe that learning depends on talent but rather believe that learning depends on effort [7].

In Eroğlu and Güven's (2006) study, it was found that students' epistemological beliefs differentiated based on the gender variable. However, they revealed that female students had higher beliefs that "learning depends on effort" compared to male students, while male students had higher beliefs that "learning depends on talent" when compared to female students [87]. Similarly, Kaleci (2012) determined that teacher candidates' epistemological beliefs exhibited a significant difference in favour of female students in all sub-scales based on the gender variable [16]. Öngen (2003) conducted a study with education faculty students and the findings revealed that girls had a lower tendency to believe that learning depends on talent compared to boys [25]. In the study conducted by Kıralp, Şahin, and Dinçyürek (2008) examining the epistemological beliefs of male and female students, it was found that the dimension of beliefs that learning depends on effort and that learning depends on talent differentiated significantly; however, no significant differentiation was observed between the genders in the dimension of belief that there is only one correct knowledge. According to the findings, it can be stated that male students have a more developed /advanced beliefs regarding that learning depends on effort and that learning depends on talent when compared to female students [62]. However, in the study conducted by Deryakulu and Büyüköztürk (2005), it was determined that female students had more advanced epistemological beliefs regarding the belief that learning depends on talent [77]. In the study conducted by Aytaç (2020), it was determined that female teacher candidates had more advanced epistemological beliefs compared to male teacher candidates [88]. In addition, Mohamed (2014) stated in his study that men are less sophisticated than women [32].

In contrast to these studies, İçen, İlğan, and Göker (2013) stated in their study titled "Analysis of Social Studies Teacher Candidates' Epistemological Beliefs" that the beliefs of teacher candidates regarding the dimensions of "the source of knowledge is authority", "learning is an innate ability", "learning does not depend on effort", and "knowledge is single and certain" did not differ regarding the gender [41]. In the study conducted by Karabulut and Ulucan (2012), it was found that there was no significant relationship between the gender variable and "scientific epistemological beliefs" of physical education teacher candidates [14]. It was found in the study carried out by Yordamlı (2020) that there was no significant difference in the mean scores of effort and belief in only one correct knowledge based on gender. However, it was revealed that male teacher candidates had higher beliefs that learning depends on talent compared to female teacher candidates [42]. In Tümkaya's (2012) study the epistemological beliefs do not differ depending on the gender of the students [89].

When the social studies teacher candidates' locus of control was evaluated regarding their parents' educational levels, it was found that there was no significant difference in terms of locus of control and its sub-scales regarding the variable of parents' educational levels. Consistent with our research findings, Uğur (2021) also found in his study that there was no difference in terms of locus of control and parents' educational levels [44].

When the epistemological beliefs of social studies teacher candidates were evaluated based on their parents' educational levels, it was found that there was no significant difference regarding the education level of either the mother or the father. This situation is valid for the the sub-scales. Similar to the findings of our research, Kıralp, Şahin, and Dinçyürek (2008) also found in their study that there was no significant difference between the group means of epistemological beliefs based on the father's educational level [62].

There are studies in the literature that show differences in students' epistemological beliefs based on the education levels of their parents. Schommer (1993) explored the relationship between parents' educational levels and students' epistemological beliefs in her study. The study revealed that

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the students who believed that there is only one correct knowledge had parents with lower education levels; on the other hand, as parents' educational levels increased, students were more likely to develop beliefs that learning depends on talent and that there is only one correct knowledge. This suggests that parental education can play a role in shaping students' epistemological beliefs regarding the nature of knowledge and learning [86] Eroğlu and Güven (2006) carried out a study to examine the epistemological beliefs of university students and determined that students had higher beliefs in the dimension of the belief that there is only one correct knowledge compared to the other two dimensions. In addition, the study revealed that students' epistemological beliefs differed based on their fathers' educational level [87].

In the study conducted by Kıralp, Şahin, and Dinçyürek (2008), the epistemological beliefs were examined in relation to the educational levels of parents; it was found that there was a significant difference in the sub-scale of epistemological belief that learning depends on effort regarding the educational level of mothers. There was a significant difference in favour of individuals with no literacy skills among university graduates when compared to those with no literacy skills; there was a significant difference in favour of middle school graduates when compared to elementary school graduates, high school graduates, and university graduates. However, no significant difference was found based on the father's educational level [62].

The fact that epistemological beliefs are influenced by cultural differences suggests that the observed differences in research may stem from cultural factors. Additionally, it is considered that factors such as the psychological, sociological, economic, and geographical characteristics of families can be influential. Therefore, it is suggested that researchers should examine individuals' family structures in relation to different dimensions in future studies.

It was determined that there was a significant difference only in the sub-scale of belief in an unjust world in the locus of control scale regarding the grade levels of social studies teacher candidates. It was determined that 1st year teacher candidates had higher arithmetic mean scores compared to 3rd year teacher candidates. It can be stated that 1st year teacher candidates have a higher level of external locus of control compared to 3rd year teacher candidates. Consistent with the results of our research, Başal et al. (2016) found in their study that the teacher candidates' locus of control did not differ according to the grade level [53]. Similarly, Garipağaoğlu and Güloğlu (2015) determined in their study that teacher candidates' locus of control did not differ according to the grade level [56].

It was determined that there was no significant difference in the social studies teacher candidates' epistemological beliefs and its sub-scales regarding the grade level variable. Consistent with the research findings, Paulsen and Wells (1998; as cited in Eroğlu, 2004) also did not find a statistically significant difference between the grade level and epistemological beliefs in their study caried out with university students. However, they observed that upper-level students had simple beliefs regarding the beliefs that learning depends on talent and there is only one correct knowledge. Öngen (2003) in his study revaled that there was no significant difference between the epistemological beliefs of education faculty students and different grade levels (1st, 2nd, 3rd, and 4th year). However, Öngen (2003) revealed that female students tended to have a lower tendency to believe that learning depends on talent compared to male students. According to the study conducted by Yordamlı (2020), there was no significant difference in the mean scores of effort and talent regarding the grade levels. Indeed, there are studies revealing that there was no differentiation in epistemological beliefs according to the grade level (Kıralp, Şahin, and Dinçyürek, 2008); the three dimensions of epistemological beliefs did not develop based on the grade level (Deryakulu and Büyüköztürk 2005), and there was no significant difference in the belief that there is only one correct knowledge (Kaleci 2012).

There are also studies in the literature that indicate differentiation of epistemological beliefs based on the grade level. Schommer (1993) examined the epistemological beliefs of university students in the fields of natural sciences and social sciences across different grade levels. The findings of the study indicated that students' epistemological beliefs varied according to their grade levels and university students' epistemological beliefs showed significant differences regarding the belief that learning depends on talent and belief that there is only one correct knowledge. Yılmaz and Kaya

(2020) in their study found that there was a statistically significant relationship between the students' grade levels and the dimensions of beliefs that learning depends on talent and that there is only one correct knowledge, while there was no significant difference regarding the belief that learning depends on effort (Yılmaz and Kaya,2020). In Tümkaya's (2012) study, according to the grade levels, it was found out that two beliefs, one of which is that "Learning depends on the effort" and the other one is that "There is one unchanging truth", differ. However; the belief concerning that "learning depends on ability" does not differ [89]. There are also studies suggesting that students' epistemological beliefs become more complex as their grade levels increase [87,90]. These studies indicate that there is a developmental progression in students' epistemological beliefs, with beliefs about knowledge becoming more sophisticated over time. Perry carried out a study to reveal the intellectual and moral diversity of university students at Harvard University. Perry examined the changes in knowledge-related beliefs of a group of students, mostly males, at Harvard University from their freshman year to their senior year and found that students' epistemological beliefs matured /developed through their final year [87]. Jehng et al. examined the relationship between students' grade level and their epistemological beliefs and found that epistemological beliefs varied according to the grade level, and they determined that as grade level increases, students tend to believe in the certainty of knowledge and perceive learning as irregular process [90]. According to the study conducted by Karabulut and Ulucan (2012), there was a significant relationship between the physical education teacher candidates' "scientific epistemological beliefs" and the grade level variable. It was observed that the ourth-year students had higher mean scores on the Scientific Epistemological Beliefs Scale compared to the first-year students [14]. In the study conducted by Kaleci (2012), significant differences were found between the groups in terms of beliefs that learning depends on effort and that learning depends on talent regarding the grade levels [16]. However, no significant difference was found in the belief that there is only one correct knowledge. According to the research conducted by Deryakulu and Büyüköztürk (2005) with education faculty students to determine the relationship between the epistemological beliefs and problem-solving, it was found that the three dimensions of epistemological beliefs did not develop regarding the grade levels [77]. According to the study conducted by Aytaç (2020), it was found that epistemological beliefs become more sophisticated as the grade level increases [88]. In another study by Keskin and Aydın (2016), it was observed that teacher candidates had higher levels of traditional epistemological beliefs based on the grade level variable [91]. In the study conducted by Yordamlı (2020), it was found that the students in their first year of university had higher beliefs regarding the belief that there is only one correct knowledge compared to the fourth-year students [42]. Schommer (1993), found that the epistemological beliefs of university students matured/developed more as their grade levels increased but emphasized that this finding cannot be generalized to all university students [86]. Paulsen and Wells, Chan, Eroğlu, and Marrs have also found similar results on the same topic [6,9,35,87,90]. When looking at these studies, it can be observed that teacher candidates' epistemological beliefs yield different results depending on the variable of grade level. Thus, longitudinal studies can be conducted to determine the underlying reasons for this difference by examining both the locus of control and epistemological beliefs of teacher candidates considering the variable of grade level.

When the relationship between the social studies teachers' locus of control and epistemological beliefs and their sub-scales is evaluated, it is observed that there is a weak but a positive relationship between the locus of control and epistemological beliefs and their sub-scales.

It can be stated that teacher candidates with higher epistemological beliefs tend to have a more internal locus of control. It is emphasized in literature that there is a significant relationship between the epistemological beliefs and locus of control and that individuals with with internal locus of control have more developed/advanced epistemological beliefs compared to those with an external locus of control. Furthermore, it is emphasized in the studies that individuals' epistemological beliefs and locus of control can be positively developed in the teaching and learning process [9,11,92].

In the study conducted by Yılmaz and Kaya (2010) to determine the relationship between nursing students' epistemological beliefs and locus of control, it was found that there was a very

weak but positive relationship between the students' locus of control scale and the dimensions of beliefs that learning depends on effort and that learning depends on talent. However, it was determined that there was no linear relationship between the students' locus of control scale and the belief that there is only one correct knowledge. The findings suggest that students' epistemological beliefs regarding the belief that learning depends on effort and that learning depends on talent are moderately developed, and thus indicating a tendency towards internal locus of control [64].

Wilkinson and Schwartz conducted two separate studies and they found that there was a significant relationship between the university students' epistemological beliefs, verbal ability levels, and locus of control. In addition, they determined that individuals with advanced epistemological beliefs had higher verbal ability levels as well as higher internal locus of control [9,72].

Deryakulu (2002) conducted a study aiming to investigate whether there was a relationship between students' locus of control, epistemological beliefs, and the criteria they used to monitor their comprehension of information in a printed instructional material regarding the program type and grade level. It was found in this study that locus of control had a significant differentiation on the level of monitoring comprehension, while epistemological beliefs and grade level had a significant differentiation on the type of monitoring comprehension [63].

In this quantitative study, the relationship between the social studies teacher candidates' epistemological beliefs and locus of control was examined in terms of their gender, grade levels, and parents' education. Researchers can conduct qualitative studies on this topic.

There is a need for carrying out research with larger sample sizes, comparing social studies teacher candidates to different groups of university students, and conducting further advanced studies in order to examine the relationship between the social studies teacher candidates' epistemological beliefs and locus of control.

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