



A Study on Art Interests and Critical Thinking Dispositions of Students in Fine Arts Department of the Faculty of Education

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Abstract: In this study, it was aimed to investigate the relationship between the art interests and critical thinking dispositions of the students who study fine arts education in the faculty of education. The sample of the research consisted of 236 fine arts education students including 123 from the department of painting teaching and 113 from the department of music education. In the research, relational survey method was used. It was found in the research that the art interests of the students were at the level that can be considered as good. In addition, it was noticed that the average scores of critical thinking dispositions of the students were at moderate level. One of the findings obtained from the study was that there was no significant difference between the scores of art interest and critical thinking according to gender. Another finding was that art interests of the students in the music department were significantly higher compared with the scores of the students in the department of art education. In addition, a positive moderate level of relationship was found between the art interest and critical thinking, analyticity, inquisitiveness sub-dimensions; significantly low positive relationship with self-confidence, systematicity, searching truth and cognitive maturity sub-dimensions.

Keywords: *Critical thinking training, art interest, fine arts training, teacher training.*

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Introduction

Criticism finds the focal point of the intellectual actions in which the multiple and in-depth perspectives are developed, with varying and rich meanings about thinking. The criticism is not to recognise only the negative aspects; it also includes demonstrating the positive aspects of that job, situation, person or product (Akar, 2007). Criticism actually means treating any situation with both good and bad aspects. The Redhouse dictionary defines the word "criticism", on the one hand, as "strictures, censure", "review, evaluation" a person, a work or a topic to find and demonstrate its right or wrong sides (Bezmez & Brown, 2013). Critical thinking, the idea of "Critical Thinking" has become more assimilate after it has been accepted that the word "critical" has no negative meaning. When the research is carried out with the concept of critical thinking, it is seen that it goes up to Socrates. According to Kaya (1997), "Previously, this concept was understood as a logical thinking that aimed to guide our behaviour through philosophy. Critical thinking, which was considered as a correct definition of events, is then widely defined" (p. 8). Today, critical thinking is defined as a process that involves questioning, examining, investigating and problem solving individuals. In short, 'Critical thinking is logical and reflective thinking that focuses on deciding what to believe and what to do' (Ennis, 2011, p. 1). Critical thinking has its own characteristics.

Aydin, (2000) defines the feature of critical thinking as follows:

1. Creating meaningful relationships between variables, eliminating the meaningless ones,
2. Evaluating the validity of the proposed solution proposals that generating new information from a set of information,
3. Ability to bring flexibility and improvable to thinking processes,
4. Approaching the problem from different perspectives,

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5. Establishing semantic and structurally consistent relationships between variables evaluating consecutively with appropriate number and quality of observations,
6. Limiting the problem area gradually according to the validated test results, describing the problem and report the current solutions.

In general, in the context of these characteristics, the Critical Thinking is defined as thinking skill, which is comprehensive, rigorous, effective, open to self-criticism, conscious and objective thinking, which is the sum of mental processes such as addressing a subject, reasoning, examining and evaluating.

We notice that Watson and Glaser (1964) describe critical thinking as a general process that includes actions such as solving the problem, questioning and doing research, and these are divided into five chapters in terms of skill and attitude. These dimensions can be summarised as:

- 1- Recognising the problem,
- 2- Bringing together and selecting appropriate information to solve the problem,
- 3- Know the structured and unstructured assumptions,
- 4- Choosing and formulating assumptions that will be relevant and final,
- 5- Find out the current results and discuss the validity of the deductions.

Critical thinking is a process. According to Mertes (1991) "critical thinking is a conscious and deliberate process that involves the interpretation and evaluation of knowledge and experience" (p. 24). Cuceloglu (1993) defines the critical thinking as, "an active and organized mental process aiming to understand the events taking place in ourselves and our environment by applying what we have learned, taking into consideration the thought processes of others, as we are aware of our own thought processes" (p.255). It can be said that the individual who knows and uses the critical thinking skills, the principles of reasoning, research methods and techniques or understands the problems that prevent critical thinking, avoids them, has a critical thinking characteristics. Facione, Facione and Giancarlo (2000) compiled critical thinking individual characteristics as;

- Analyticity,
- Open mindedness,
- Inquisitiveness,
- Self-confidence,
- Searching truth,
- Systematicity,
- Cognitive maturity.

After all, it can be claimed that an individual, who has developed critical thinking skill, is the person who has most of the characteristics as testing the source of information, questioning the accuracy, distinguishing necessary and unnecessary information, moving away from prejudices and biased behaviour, distinguishing right and wrong, recognizing inconsistent behaviour, recognizing and using different learning and thinking styles, being open to new ideas, benefitting from those ideas, gaining independent thinking skills, being aware of the responsibilities, being able to think deeply and flexibly, being able to produce solutions, being determined, versatility, reasoning skills, having critical thinking, examining, analysing and evaluating, being objective, active listening and asking effective questions, comparing different ideas, using correct criteria in evaluation, fair, impartial and transparent thinking, being flexible towards different ideas, respecting the expression of thoughts, fulfilling the responsibility, acting honestly and ethically, acting in a principled way, accepting that s/he can be wrong and being open to criticism (Eren, 2017)

Instead of transferring information in teaching, learning of thinking becomes important. Therefore, in modern schools, individuals who think, criticize, produce, know the ways of accessing information are trained and training programs are prepared to give students thinking skills (Seferoglu & Akbiyik, 2006). Norris (1985) defined critical thinking in terms of education as the students' putting into practice what they already knew and changing their pre-learning by valuing their thoughts. In order to be able to learn the contents of the courses in a permanently, students need to study effectively in this process rather than memorising the information (Paul & Elder, 2001).

In the studies, in which the critical thinking dispositions of the pre-service teachers studying in different departments of the faculties of education are determined (Turnuklu & Yesildere, 2005; Korkmaz, 2009; Tumkaya 2011; Kucuk & Uzun, 2013; Akyuzler, 2014; Can & Kaymakci, 2015; Yildirim & Sensoy, 2017; Aslan & Aybek, 2017; Ozdemir, Buyruk & Gungor, 2018), it is seen that the stakeholders in general have different and sometimes common ideas in many respects. For instance, in the study by Korkmaz (2009), "it was found that the education given in the Faculties of Education did not contribute as much to the level of critical thinking disposition of pre-service teachers, it was stated

that the situations as the students' education had more theoretical dimensions, the students were generally hesitant in the learning and teaching environments, the choice of test type measurement tools in the evaluation activities, the fact that the activities, the lack of much emphasis on activities requiring analysis, synthesis and evaluation could have caused this result" (p.893).

The reason why this study is carried out with the students who are trained in fine arts is to give an important place in the education process to develop the critical thinking ability, which is one of the aims of art education. Considering that one of the four disciplines of art education is art criticism, in order to be able to make art criticism, a student with a fine arts education should be able to look critically. As in every field, it is important to be able to educate teachers who can use different learning styles and different production styles, containing high creativity, and who are able to adopt and think critically. Ennis (1985) states that critical thinking consists of talents and dispositions. Mercin and Alakus (2007) noted that "As it is known, in the previous aim of art education, "the use of the universal language of art" takes an important place. Man's expression through artistic thinking is important, but the experiences gained in this way can be an important means of self-expression and can begin to make a person unique. The original narrative effort brings together the critical thinking and synthesis-interpretation that forms the basis of original thinking" (p. 18). In the study, also it was tried to investigate whether art criticism dispositions differ according to the art interest levels by determining the interest levels of art of the students. This is because "personality is a term that includes a person's interests, attitudes, abilities, physical appearance, and the harmony with his surroundings" (Per & Beyoglu, 2011, p. 247). Critical thinking helps to make comments and judgements by creating solutions, explain events, and understand people. Art contributes developing the critical thinking skills as it depends both observation, uses criticism, and enables being criticised in its stages frequently. "A visual arts education program focusing on art criticism for development of critical thinking skills can be offered" (Demirel & Buyurgan, 2017). According to Unver (2002), those who have taken critical discipline education have the skills to develop sensitive behaviours to not only works of art but also all social events. In addition, Hicks (2004) emphasised that art is a dynamic process in which the individual can express himself in different ways against what is happening around him. In this dynamic process, the art of the individual to a position against what is happening. The individual's interest in the art and knowledge is provided by the ability to judge it. Gokaydin (2010) also claims that the art training, which is a significant activity in general training environment, is an education system that develops children's and young people's mental powers at all levels of education, and students can learn how to look, ask, try, think, reach the conclusion and perform (p.42).

"The integral nature of the arts allows for the performer to become an active problem solver and, therefore, provides a direct impact upon the overall outcome" (Zellner, 2011, 32). Starting from the point where the art interest can change among the people who received art education, it was one of the aims of the study whether individuals' interest in art has an effect on critical thinking dispositions. In this context, the study is expected to be a guide for other studies to be performed with similar studies. In this study, it was aimed to examine the art interests and critical thinking levels of the students receiving fine arts education in terms of some variables and these following research questions were asked:

1. What is the level of art interest and critical thinking dispositions of pre-service teachers in fine arts department?
2. Is there a significant difference between the levels of art interests and critical thinking disposition according to the gender of pre-service teachers in fine arts department?
3. Is there a significant difference between the levels of art interests and critical thinking disposition according to the department of pre-service teachers in fine arts department?
4. Is there a significant difference between the levels of art interests and critical thinking disposition according to the class of pre-service teachers in fine arts department?
5. Is there a significant difference between the levels of critical thinking disposition of the pre-service teachers in fine arts department?
6. Is there a significant relationship between the art interests and their critical thinking dispositions (Sub-dimensions) of the pre-service teachers in fine arts department?

Methodology

Research Goal

The aim of this research is to investigate the art interests and critical thinking dispositions of the students in fine arts training departments of the faculty of education in terms of some variables (gender, department). In addition, the relationship between the art interest levels and critical thinking dispositions of the students was also investigated in the research. The research is beneficial in terms of measuring the relationship between the art training, art interest and critical thinking disposition.

Akarsu (2016) "...shows that our education system is deficient in developing the individuals' critical thinking skills (p.4). That the applied education systems are insufficient have brought some ways of solution.

"However, experiences gained from the current practices demonstrate that sufficient time does not exist in private courses or programs and what has been learned cannot be reflected to the other sides of the life" (Wright, Huitt ' cited in Sensekerci & Bilgin, 2008, p. 30).

It is known that the criticism, which is defined as "evaluating something with good or bad sides" (Ruppel, 2005) is a method the instructors applied frequently in the evaluation stages of the art training. In this context, it is obvious that the relationship between the art interest and critical thinking is worth to be measured.

Research Model

The research is the survey type of quantitative research methods. Survey research is a quantitative type of research in which a researcher applies a questionnaire to describe their attitudes, views, behaviours or characteristics in a sample or universe. The researcher collects quantitative data using surveys or interviews and statistically analyses the data to identify trends and test research questions or hypotheses about responses to questions. S/He also interprets the results of the statistical test by linking the results of previous research with the meaning of the data (Creswell' as cited in Babayigit, 2018, p. 37).

In this study, the survey method was preferred because "sampling using probability methods to select potential survey respondents makes it possible to estimate the characteristics (e.g., socio-demographics, attitudes, behaviours, opinions, skills, preferences and values) of a population without collecting data from all members of the population" (West, 2019).

Sample

The research universe consisted of 1100 students, who were in the departments of fine arts training in the 6 provinces of the Eastern Anatolia Region. In descriptive researches minimum 10% sample is dealt, even 20% is needed in small universes. However, high sample size increases the reliability of the results (Gay' as cited in Arli & Nazik, 2001, p.77). The study group of the research consisted of totally 236 students (128 (54,2%) females and 108 (45,8%) males), 123 (52,1%), of whom in the Art Training Department of Faculty of Education in Erzincan Binali Yildirim University and 113 (47,9%) in the Music Training Department.

To determine the study group, the criterion sampling was applied among the purposive sampling methods. Purposive sampling is a non-probability-based sampling approach that allows in-depth research by selecting information-rich situations depending on the purpose of the research. The researcher tries to understand and explain the nature and society events or phenomena and the relationship between them in the context of selected situations (Buyukozturk, Kilic-Cakmak, Akgun, Karadeniz, & Demirel, 2012).

On the other hand, the criterion sampling is studying and reviewing all situations that meet some predetermined importance criteria (Patton, 2014). These criterion or criteria can be generated by researcher or a list of previously prepared criteria can be followed (Yildirim & Simsek, 2006). Data in the study were obtained with the document analysis technique.

Data Collection Tool

Two measuring instruments were used to collect the necessary data for this research. These were (1) the Art Interest Inventory, (2) the California Critical Thinking Disposition Inventory.

Art Interest Inventory (AII): It is an inventory developed by Taskesen (2014). AII is a scale, which has the scores between 0-5 and consists of 20 items. The higher scores indicate that the interest in art is high. There are 10 items in each dimension of the scale consisting of feelings-thoughts and behavioural dimensions. In the reliability study of the scale, Cronbach Alpha coefficient was .84. After the factor analysis of the 20-item Art Interest Scale, a 2-factor structure with a core value of over 4.00 explaining 41% of the total variance emerged. As a result of the confirmatory factor analysis conducted to confirm this structure, the fit index values were found as RMSEA = .052, GFI = .90, CFI = .90, AGFI = .89, NFI = .89, NNFI = .90 and SRMR = .048. In this study, Cronbach Alpha coefficient was found as .78.

In the research, EFA (Exploratory Factor Analysis) was applied for the measurement validity.

To test the sample size, Kaiser-Meyer-Olkin (KMO) coefficient was calculated and KMO value was found as 0,85. According to this result, it was understood that necessary sampling size was provided for EFA (Tavsancil, 2010). Secondly, for EFA, the distribution in the universe is desired to be normal (Cokluk , Sekercioglu & Buyukozturk, 2010). To test the distribution status of the obtained data, Bartlett was used and Chi-square value was calculated ($\chi^2=1747,323, p<.05$). At the end of the EFA after necessary preliminary analyses, 5 factors, whose core values were greater than 1 were found. The total variance explained by the scale collected in five factors was 60%.

Some example questions stated in the scale were given below.

1. Whenever I see a poster related to art

2. I think that art is necessary for individual development
3. I don't like reading book promotions of newspaper supplements
4. I don't like following artistic events on internet.
5. I am not interested in painting exhibitions

California Critical Thinking Disposition Inventory (CCTDI): The California Critical Thinking Disposition Inventory, which was developed by Facione, Facione and Giancarlo, (1998) was adopted into Turkish by Kokdemir (2003), and the item number was reduced to 51. The scale was prepared in the form of a six-point Likert scale, which was scored between 1-6 to measure the students' critical thinking dispositions. The higher score obtained from the scale indicates the higher degree of critical thinking disposition. In this study, Cronbach Alpha reliability coefficient of the scale was found as .80.

The factor analysis test was used to test the measurement validity of The California Critical Thinking Inventory. Firstly, in order to test the sampling size, the Kaiser-Meyer-Olkin (KMO) coefficient was calculated and KMO value was found as 0,90. To test the distribution status of the obtained data, Bartlett was used and Chi-square value was calculated ($\chi^2=2622,767$, $p<.05$). At the end of the EFA after necessary preliminary analyses, 5 factors, whose core values were greater than 1 were found. The total variance explained by the scale collected in five factors was 57%.

Some example questions stated in the scale were given below.

1. It would be great to study new things all my life.
2. It makes me annoyed that people trust ill-thoughts to defend a good idea.
3. I always focus on the question before attempting to answer.
4. I am proud to be able to think in a great clarity.
5. If there are four pros and one cons, I agree with four pros opinion.

Data were collected with the permission of the Dean of the Faculty of Education in May in 2018.

The researcher introduced herself and gave short information about the research. Firstly, the participants were asked to fill the "Critical Thinking Disposition Inventory" in 30 minutes. Then, 30 minutes were given for the filling of the "Art Interest Inventory". Both inventories were filled in one course time. The forms filled by the students were gathered by the researcher.

Analyzing of Data

Descriptive statistics, correlation and variance analysis of the variables were tested at .05 significance level using SPSS 22.00 program. The art interests of students gathered from "Art Interest Inventory" and the art disposition scores gathered from "The California Critical Thinking Disposition Inventory" constituted the critical thinking disposition scores of the students.

"The scale is a likert type including 20 items that are developed in order to evaluate individuals' interest in art. Individuals are required to show how much each item in the scale fits them by scoring the scale between 1 and 5. 5 items (3, 5, 9, 16, 17) in the scale are reverse scored. The lowest score is 20 while the highest score is 100 in the scale. The scale can be conducted both on groups and individuals; standard answering time of the scale is 30 minutes" (Taskesen, 2014a, p. 222).

In The California Critical Thinking Disposition Inventory, people with a score of less than 40 for each subscale say that their critical thinking dispositions in that dimension are low, and those with a score higher than 50 have a high critical thinking disposition. Therefore, as the CCTDI is evaluated as a whole, people who have a score of less than 240 (40 x 6) have low general critical thinking dispositions and those with a score greater than 300 (50 x 6) may be described to have a high disposition (Kokdemir, 2003, p. 84).

The difference between the art interests and critical thinking dispositions of the students of the Department of Fine Arts according to the department, gender and class variables were tested. In the research, the relationship between art interest and critical thinking disposition was investigated. Considering that the data provided the assumption of normality, among the parametric tests, independent samples t-test (for the variable of department and gender), One-way Variance Analysis (ANOVA) test (for the class level variable) were used. In addition, Pearson correlation coefficient was used to test the correlation between art interest and critical thinking dispositions in the research.

Findings/Results

1. *What is the level of art interest and critical thinking dispositions of pre-service teachers in fine arts department?*

The descriptive statistics related to the art interest and critical thinking disposition of pre-service teachers in fine arts department are presented in Table 1.

Table 1. The descriptive statistics related to the art interest and critical thinking disposition of pre-service teachers in fine arts department.

Inventories	N	\bar{x}
Art Interest Inventory	236	77.89
California Critical Thinking Disposition Inventory	236	205.34

The average scores of the art interest and critical thinking disposition of 236 fine arts education students are presented in Table 1. Considering that the total score that can be taken from the art interest inventory is 100, it can be claimed that the students' average interest in art is at a good level. "The lowest score is 20 while the highest score is 100 in the scale" (Taskesen, 2014a, p. 222). Considering that the highest score that can be taken from the critical thinking tendency inventory is 306, it can be claimed that the level of critical thinking dispositions of the students is low. "...people who have a score of less than 240 (40 x 6) have low general critical thinking dispositions and those with a score greater than 300 (50 x 6) may be described to have a high disposition (Kokdemir, 2003, p. 84). Considering that students receive art education, it is possible to evaluate that both art interest and critical thinking disposition is not sufficient to meet expectations.

2. Is there a significant difference between the levels of art interests and critical thinking disposition according to the gender of pre-service teachers in fine arts department?

The independent samples t-test results of the female and male students related to determine the difference between female and male students' art interests and critical thinking dispositions are presented in Table 2.

Table 2. The Independent Samples T-test Results of the Fine Arts Education Department Students in terms of the difference their art interests and critical thinking disposition levels according to the gender

Inventories	Group	N	\bar{x}	Std. Dev.	df	t	p
All	Female	128	78.23	11,44	234	.481	.631
	Male	108	77.50	11.71			
CCTDI	Female	128	206.60	23.32	234	.928	.354
	Male	108	203.84	22.03			

According to Table 2, as the average scores of the art interests of female and male students are compared, it is noticed that the average art interest scores was 78.23 of the female students is higher than the average scores was 77.50 of male students. According to the independent sample t-test calculated to determine the difference between the scores of female students and male scores [t (11) = .48 p> .05], it was found there was no significant difference. This finding shows that the level of artistic interest of female students is no different from that of male students.

In addition, according to Table 2, as the average values of the female and male students' critical thinking disposition are compared, it is seen that the average score was 206.60 critical thinking dispositions of the female students are higher than the average score was 203.84 of male students. When the standard deviation values are examined, it is understood that the measurements of male students are more homogeneous than S = 22.03 female students. According to the Independent samples t-test [t (23) = .92 p> .05] calculated to determine the difference between female and male scores, no significant difference was found.

3. Is there a significant difference between the levels of art interests and critical thinking disposition according to the department of pre-service teachers in fine arts department?

The results of the independent samples t-test, which was calculated to determine the difference between the average scores of art interests and the average scores of critical thinking disposition of the painting and music education students, are presented in Table 3.

Table 3. The Independent Samples T-test Results related to the difference in art interest and critical thinking disposition levels of students in the Department of Fine Arts according to the Department

Inventories	Group	N	\bar{x}	Std. Dev.	df	t	p
All	Painting	123	76.43	11,16	234	-2.045	.042
	Music	113	79.49	11.78			
CCTDI	Painting	123	206.45	21.50	234	.781	.436
	Music	113	204.13	24.04			

According to Table 3, as the average values of the students in the department of painting and music are compared, it is seen that the average art interest scores \bar{x} = 79.49 of the students in painting department are higher than the scores of \bar{x} = 76.43 the students in music department. When the standard deviation values are examined, it is understood that the

measurements $S = 11.16$ of the students of the department of painting are more homogeneous compared with the music department students $S = 11.78$. According to the Independent samples t-test calculated to determine the difference between the scores of the students of the department of painting and the scores of the students of the music department, the significant difference was found as $[t(11) = -2.045, p < .05]$.

According to the Table 3, as the arithmetic average values of the students of the Department of Painting and Music Department, it is seen that the average critical thinking disposition score $\bar{x} = 206,45$ of the students in the department of painting is higher than the average score $\bar{x} = 204,13$ of the students in music department. As the standard deviation values are examined, it is understood that the measurements of the students in the department of painting $S = 21.50$ is more homogenous than the measurements of the students in music department $S = 24.04$. According to the Independent samples t-test calculated to determine the difference between the scores of the students of the department of painting and the scores of the students of the music department, no significant difference was found $[t(21) = .781, p > .05]$.

4. *Is there a significant difference between the levels of art interests and critical thinking disposition according to the class of pre-service teachers in fine arts department?*

One-way ANOVA results calculated to determine the difference between the average scores of art interest of the students in fine arts department according to the class are presented in Table 4.

Table 4. The ANOVA test results related to the average art interest scores of the students in the Department of Fine Arts according to Class

Variable	Class	N	\bar{x}	Std.Dev.	df	F	p
Art Interest	1st Class	75	78,31	11,04	3-232	2.72	.045
	2nd Class	47	74,21	12,26			
	3rd Class	55	77,64	9,98			
	4th Class	59	80,54	12,41			

As the art interest of the students in 1st, 2nd, 3rd and 4th year of the Department of Fine Arts are taken into consideration, it is seen that the average scores of the art interest level demonstrate increase from the 1st to 4th year $\bar{x} = 78.31 > \bar{x} = 74.21 < \bar{x} = 77.64 < \bar{x} = 80.54$. It was found that the data obtained from the last year students were higher than all class levels, and this difference was significant. When the standard deviation values of the scores related to the students' level of critical thinking disposition are examined in the table, it is understood that 3th year students ($S = 9.98$) make more homogenous evaluation compared with the 1st class ($S = 11.04$), 2nd class ($S = 12.26$) and 4th class students ($S = 12.41$). According to the one-way ANOVA test results, there is a significant difference between the level of art interest of the pre-service teachers in the Department of Fine Arts according to the class level $[F(3-232) = 2.72, p < .05]$. The TUKEY test, which was used to find the place of the difference in terms of the classes, it was found to be among the 4th year and 2nd year students.

5. *Is there a significant difference between the levels of critical thinking disposition of the pre-service teachers in fine arts department?*

The one-way ANOVA analysis results calculated to determine the difference between the average scores of critical thinking disposition of pre-service teachers in the department of fine arts education according to the class variable are presented in Table 5.

Table 5. The ANOVA tests results related to the California Critical Thinking Disposition Inventory average scores of students in the department of fine arts according to the class level

Variable	Class	N	\bar{x}	Std. Dev.	df	F	p
Critical Thinking Disposition	1st Year	75	207,25	21,87	3-232	2.52	.059
	2nd Year	47	197,70	25,26			
	3rd Year	55	205,25	20,43			
	4th Year	59	209,07	22,87			

As the critical thinking disposition average scores of students in 1st, 2nd, 3rd and 4th year students in the department of fine arts demonstrated in Table 5 is taken into consideration, it is seen that there is no increase or decrease in the critical thinking disposition level average scores from 1st to 4th year ($\bar{x} = 207.25 > \bar{x} = 197.70 < \bar{x} = 205.25 < \bar{x} = 209.07$). It was found that the data obtained from the last year students are higher than all class levels, but this difference is not significant. In the table, when the standard deviation values of the scores related to students' critical thinking disposition, depending on the class level, are examined, it is understood that the 3rd year students ($s = 20.43$) do more homogenous evaluation compared with 1st year ($S = 21.87$), 4th year ($S = 22.87$) and 2nd year ($S = 25.26$) students. According to the one way ANOVA test results, it is seen that there is no significant difference between the critical thinking levels of the students in the department of fine arts according to class level variable $[F(3-232) = 2.52, p > .05]$.

6. Is there a significant relationship between the art interests and their critical thinking dispositions (Sub-dimensions) of the pre-service teachers in fine arts department?

The Pearson Correlation test results related to the relationship between the art interests and critical thinking dispositions of pre-service teachers in fine arts department are presented in Table 6.

Table 6. Pearson Correlation Coefficients related to the relationship between Art Interests and Critical Thinking Dispositions (Sub-dimensions) of students in Fine Arts Department

		Art Interest	Crit.Thinking Disp	Systematicity	Searching truth	Analyticity	Open mindedness	Inquisitiveness	Self-confidence
Art Interest	Pearson Correlation	1	,472	,277	,105	,418	,026	,421	,320
	p		,000	,000	,108	,000	,691	,000	,000
	n	236	236	236	236	236	236	236	236

According to Table 6, there is a moderate positive and significant relationship between the students' art interest and critical thinking disposition scores ($r=472$, $p < 0.05$). Considering the relationship between sub-dimensions of art interest and critical thinking disposition, there is a moderate positive and significant relationship between the art interest and analyticity ($r=418$, $p < 0.05$), and art interest and inquisitiveness ($r=421$, $p < 0.05$). In addition, a low level of relationship was encountered between art interest and systematicity ($r=277$, $p < 0.05$), and art interest and self-confidence ($r=320$, $p < 0.05$). No relationship was encountered between art interest and searching truth ($r=105$, $p > 0.05$), and open-mindedness ($r=026$, $p > 0.05$).

Discussion and Conclusion

That the lowest score that can be obtained from the scale is 20, the highest score is 100 (Taskesen, 2014a) compared to the average score of art interest of 77, 89 allows this explanation. We can claim that this situation may be caused by students' education in art. For instance, in a study by Taskesen, Guler & Naldan (2017), the art interests of the students in general high school and fine arts high school were compared and a meaningful difference in favor of the students in fine arts high school were reached. In addition, in the study, in which Alici (2019) investigated the art interests of the students in the faculty of education, it was found that the art interests of the students in fine arts training department were found to be meaningfully higher than the students in other departments. According to the research carried out with undergraduate students by Taskesen (2012), the need of students in getting art education was 41% at moderate level and 44% at good level. In addition, in the research, no difference in art interest was reached according to gender variable. In a few researches on the subject, the art interest of in favor of female students is high. In a study conducted with high school students, a significant difference was reached in favor of female students (Taskesen, Naldan, Guler, 2017). In the research of Alici (2019), it was also found that the art interests of students in the faculty of education were high in favor of female students. In a study in which academic motivations of students of fine arts education were investigated according to gender, (Yilmaz, Taskesen & Taskesen, 2016, p.1065) a significant difference was observed in favor of girls.

The level of critical thinking disposition was found to be low in the research. The result of the study conducted by Kucuk and Uzun (2013) on music teachers demonstrated that the pre-service music teachers had low level of critical thinking disposition in general. In addition to this study, in other studies in which the critical thinking dispositions of the pre-service teachers studying in different departments of the faculties of education are investigated, different results are found. According to the findings of the study by Saglam and Buyukuysal (2013) on the critical thinking dispositions of last year students in faculty of education and the opinions of the relevant interruptions, it was concluded that the critical thinking levels of the students in the last year of the department of Turkish Education and Primary School Teaching in the Faculty of Education were low in general. In the studies by Besoluk and Onder (2011), again, it was found that the teachers' critical thinking tendencies were generally moderate and low. Moreover, Yucler (2013) determined that found that per-service teachers' critical thinking skills were low and moderate in which the critical thinking dispositions of Foreign Language pre-service teachers were examined. Tumkaya (2011) found that the critical thinking skills of the students were low. Again in the study of (Turnuklu & Yesildere, 2005; Korkmaz, 2009), who conducted about researches, it was observed that the critical thinking disposition levels of pre-service teachers were generally moderate. The findings of the present study support other studies' results.

Another finding is that; as the art interests average values of female and male students are compared, it is seen that the average score of the female students' art interests is higher than that of the males. However, it was found that there was no significant difference between the scores. In addition, as the average values of female and male students' critical

thinking disposition are examined, it is seen that the average score of female students' critical thinking disposition is higher than the average score of male students. Nevertheless, no significant difference was encountered, either. In addition, in related studies by (Kawashima & Shiomi, 2007; Ozturk & Ulusoy, 2008; Ekinci and Aybek 2010; Narin and Aybek 2010, Tumkaya, 2011; Coskun, 2013, Yuksel, Sari Uzun & Dost, 2013; Karadeniz-Bayrak, 2014, Bayindir 2015), it was found that the gender variable did not have any significant effect on critical thinking disposition. Also, in similar study by Korkmaz (2009), it was found that gender did not constitute a significant difference for the critical thinking disposition. In the study of Ozdemir (2005), it was concluded that the critical thinking disposition of university students did not show a significant difference according to the gender variable. Walsh and Hardy (1999) concluded that there was no significant difference in gender studies in their critical thinking studies. In the research of Yildirim and Sensoy (2017) related to the critical thinking dispositions of pre-service Science teachers, no meaningful difference was encountered according to the gender variable. In the study conducted by Kucuk and Uzun (2013) it was determined that the critical thinking skills of pre-service music teachers did not make any difference according to gender variable. The results of the studies support the findings of this study. According to these results, it can be said that critical thinking is an independent disposition from the gender variable. On the other hand, Memduhoglu and Keles (2016), reaching another result, claimed that the critical thinking dispositions of female pre-service teachers are higher than the critical thinking dispositions of male pre-service teachers. Zayif (2008) also reached the result in a related study that the critical thinking dispositions of male pre-service teachers were higher compared with the females. In the study by Aybek and Aslan (2017) the critical thinking dispositions of pre-service teachers demonstrated significant difference.

In another finding, as the art interests of the students in department of painting and music department were compared, the art interest average scores of students in music department were found to be higher than the students in department of painting. Moreover, it was concluded that the difference was significant. In addition, as the average arithmetic values of the painting and music department were compared, it was observed that the critical thinking dispositions of the students in department of painting were higher than the scores of students in music department. It was also found that there was no significant difference between the scores of students in department of painting and the students in music department. In similar study by Hamurcu, Gunay and Akamca (2005), in which they investigated the critical thinking dispositions of science and primary school teaching departments, found that the students in undergraduate program of primary school teaching department had higher critical thinking scores.

In another finding, as the art interest scores of the students attending in 1st, 2nd, 3rd and 4th years in the department of fine arts according to class variable were taken into consideration, an increase was noticed in their art interest levels average scores from the 1st to 4th year. It was found that the data obtained from the last year students were higher than all class levels and this difference was significant. It was seen that there was a significant difference between the levels of art interest of the students of Fine Arts Education Department according to their class levels. In this situation, we can conclude that the students have a positive result depending on the art education they received and that the art education provided by the pre-service teachers contributes to them.

In another finding of the research, as the average scores of critical thinking dispositions of students studying in the 1st, 2nd, 3rd and 4th years of Fine Arts Education Department are examined, it is seen that there is no decrease or increase in the average scores of critical thinking dispositions from 1 to 4. It was found that the data obtained from the last year students were higher than all grade levels but this difference was not meaningful. Aybek (2006) found that the level of critical thinking and critical thinking dispositions of students in their last year was higher than the third and second class students. In addition, Kucuk and Uzun (2013) determined that the total score of critical thinking levels of pre-service music teachers did not make any difference in terms of class level in the study. Yildirim and Sensoy (2017) found in their study related to the Critical Thinking dispositions of Pre-service Science Teachers that the critical thinking scores increased from the first class to the fourth class according to the class variable, but this increase did not constitute a significant difference according to the class level variable. In the study by Akyuzluer (2014) it was found that there was no significant difference between the levels of Critical Thinking dispositions of pre-service music teachers according to their class levels. In this case, it can be claimed that the critical thinking dispositions of pre-service music teachers overlapped according to class level. Same result exists in the study by Aybek and Aslan (2017) there is no significant difference between the pre-service teachers' critical thinking dispositions and the class-level variable. It is seen that there is no significant difference between the levels of critical thinking according to the grade levels of the students of the Department of Fine Arts Education. In the study by Sacli and Demirhan (2008), it was found that the level of critical thinking of first class pre-service teachers of Physical Education and Sports Teaching undergraduate program was low compared to the pre-service teachers who were educated in two, three and fourth classes and this difference was significant.

As the findings of the difference between the art interests and the critical thinking dispositions (sub-dimensions) of pre-service teachers in the department of fine arts education are taken into consideration, there is a moderate positive and significant relationship between art interest and critical thinking disposition scores. As the relationship between sub-dimensions of art interest and critical thinking dispositions are considered, there is a moderate positive and significant relationship between art interest and analyticity and between art interest and inquisitiveness. In addition, there is a low level of relationship between art interest and systematicity, and between art interest and self-confidence.

No relation was found between the interest of art and the existence of the searching the truth; and between art interest and open mindedness. In some studies, positive and meaningful relationships were reached between the personality types that can explain the sub-dimensions of art and critical thinking. For instance, openness to extraversion and experience can predict sub-dimensions of inquisitiveness and open-mindedness. Studies have found that there is a positive relationship between openness and experience, and art choice and art interest. (Taskesen, 2014a; Taskesen, 2014b; Furnham & Chamorro- Premuzic, 2003; Zonash & Naqvi, 2011; Alkan et al., 2007; Taskesen & Alpan, 2018)

At the end of the study, in which the art interest was investigated in connection with the critical thinking skills, gender type, class level, and academic achievement variables did not have a significant effect on the critical thinking disposition levels of pre-service teacher in the department of fine arts education. The increase occurred according to class level is an expected result because thanks to the lessons learned from the first year, the students of fine arts need to have knowledge about critical thinking when they reach the last class and the critical thinking dispositions should be increased. However, in the study, which we see that the increase in class level is not significant, it is concluded that the art education they received at university did not have a decisive effect on the level of critical thinking disposition. For this result, it is thought that the results will be more efficient if the planning of the pre-service teachers' critical thinking skills is made. In addition, the fact that a teacher does not have a course that includes a critical thinking directly in the undergraduate degree programs can lead to the emergence of such a result.

Considering the research findings, these following recommendations can be given:

Specifically in undergraduate programs, where the art and design practice is common, researches related to the critical thinking levels are recommended.

In researches that will be held, it will be significant to compare the courses, that predict the critical thinking, with others.

Analysing the application processes of programs with visual product criticism such as visual arts education, researches identifying deficiencies can be conducted.

The courses that will enable the development of critical thinking dispositions of fine arts education pre-service teachers can be included in the program.

The lessons stated in the program can be revised for pre-service teachers in terms of the critical thinking to support and uncover the sub-dimensions as; analyticity, open mindedness, inquisitiveness, self-confidence, searching truth, systematicity.

It is important for the literature to conduct researches with large sample to investigate the relationship between art education and critical thinking.

References

- Akar, C. (2007). *Critical thinking skills of elementary school students* (Unpublished doctoral dissertation). Gazi University, Ankara, Turkey.
- Akarsu, B. (2018). *Elestirel dusunme sanati [Art of critical thinking]*. Istanbul: Sistem
- Akyuzluer, F. (2014). Muzik ogretmeni egitim programinin muzik ogretmen adaylarinin elestirel dusunme becerileri uzerindeki etkileri [The effects of the music teacher training program on the critical thinking skills of music teacher candidates]. *E-Journal of NWSA- Fine Arts*, 9(3), 111-119
- Alici, S. (2019). Analyzing the relation between students' interest in art and their style for handling stress in faculty of education (Unpublished master's thesis). Erzincan Binali Yildirim University, Erzincan, Turkey.
- Arli, M., & Nazik, H. (2001). *Bilimsel arastirmaya giris* [Introduction to scientific research]. Ankara: Gazi.
- Alkan, S., Ordulu, M. Z., Sezer, Y., Soyer, E., Aslan, D., & Sayer, I. (2007). Extroversion personality characteristics and awareness of works of art . *Turkish Journal of Medical Sciences*, 37(5), 311-317
- Aslan, S., & Aybek, B. (2017). Ogretmen adaylarinin elestirel dusunme egilimleri ile benimsedikleri egitim felsefelerinin cesitli degiskenler acisindan incelenmesi [An Investigation of Educational Philosophies Adopted and Critical Thinking Disposition in terms of Various Variables]. *Gaziantep University Journal of Social Sciences*, 16(2), 373-385. doi: 10.21547/jss.281737
- Aybek, B. (2006). *Konu ve beceri temelli elestirel dusunme ogretiminin ogretmen adaylarinin elestirel dusunme egilimi ve duzeyine etkisi* [The effect of content and skill based critical thinking teaching on prospective teachers' disposition and level in critical thinking] (Unpublished doctoral dissertation). Cukurova University, Adana, Turkey.
- Aydin, A. (2000). *Gelisim ve ogrenme psikolojisi* [Developmental and learning psychology]. Istanbul: Alfa.

- Babayigit, O. (2019). Sixth grade students' listening comprehension of the story text. *International Journal of Educational Methodology*, 5(1), 35-42. doi: 10.12973/ijem.5.1.35
- Bayindir, G. (2015). *Critical thinking dispositions of primary school secondary stage students* (Unpublished master's thesis). Ahi Evran University, Kirsehir, Turkey.
- Besoluk, S., & Onder, I. (2010). Ogretmen adaylarinin ogrenme yaklasimlari, ogrenme stilleri ve elestirel dusunme becerilerinin incelenmesi [Investigation of Teacher Candidates' Learning Approaches, Learning Styles and Critical Thinking Dispositions]. *Ilkogretim Online*, 9(2), 679-693
- Bezmez, S., & Brown, C. H. (2013). *Redhause* (36th ed.). Istanbul: Sev.
- Buyukozturk, S., Kilic, Cakmak, E., Akgun, O., Karadeniz, S., & Demirel, F. (2012). *Bilimsel arastirma yontemleri* [Scientific research methodologies]. Ankara: Pegem A.
- Can, S., & Kaymakci, G. (2015). Pre-service teachers' critical thinking tendencies. *E-Journal of New World Sciences Academy*, 10(2), 66-83
- Cokluk, O., Sekercioglu, G., & Buyukozturk, S. (2010). *Sosyal bilimler icin cok degiskenli istatistik: SPSS ve LISREL uygulamalari* [Multivariate statistics for social sciences: SPSS and LISREL applications]. Ankara: Pegem A.
- Coskun, M. K. (2013). Din kulturu ve ahlak bilgisi ogretmen adaylarinin elestirel dusunme egilimleri [Critical Thinking Level and Dispositions of Pre-Service Teachers of Religious Culture and Ethics Knowledge]. *Journal of Ataturk University Social Sciences Institute*, 17(1), 143-162.
- Cuceloglu, D. (1993). *Iyi dusun, dogru karar ver* [Think well, make the right decision]. Istanbul: Sistem.
- Demirel, I., N., & Buyurgan, S. (2017). Analysing the relationship between critical thinking skills and problem behaviours of children at social risk through visual arts education. *Education and Science*, 42(190), 131-155
- Ekin, O., & Aybek, B. (2010). Ogretmen adaylarinin empatik ve elestirel dusunme egilimlerinin incelenmesi [Analysis of the empathic and the critical thinking disposition of the teacher candidates]. *Ilkogretim-Online*, 9(2), 816-827
- Ennis, R. H. (1985). Goals for A Critical Thinking Curriculum. In A. L. Costa (Ed.), *Developing minds: A resource book for teaching thinking* (pp. 54-57). Alexandria, VA: ASCD.
- Ennis, R. H. (2011). The Nature of critical thinking: An outline of critical thinking dispositions and abilities. Retrieved from https://education.illinois.edu/docs/default-source/faculty-documents/robert-ennis/thenatureofcriticalthinking_51711_000.pdf?sfvrsn=7bb51288_2
- Eren, C. (2017, January 5). Elestirel dusunme nedir? Elestirel bir dusunme becerisine sahip misiniz? [What is critical thinking? Do you have a critical thinking ability?]. Retrieved from <http://filoji.com/elestirel-dusunme-nedir-elestirel-bir-dusunme-becerisine-sahip-misiniz/>
- Facione, P. A., Facione, N. C., & Giancarlo, C. A. (1998). *The California critical thinking disposition inventory test manual* (Revised ed.). Millbrae, CA: California Academic Press.
- Facione, P. A., Facione, N. C. & Giancarlo C. A. F., (2000). The disposition toward critical thinking: its character, *Measurement, and Relationship to Critical Thinking Skill. Informal Logic*, 20(1), 61-84.
- Furnham, A., & Chamorro- Premuzic, T. (2004). Personality, intelligence, and art. *Personality and Individual Differences*. 36, 705-715.
- Gokaydin, N. (2010). *Temel sanat eđitimi* [Basic art education]. Istanbul, Turkey: Moss.
- Hamurcu, H., Gunay, Y., & Akamca, G.O., (2005). Fen bilgisi ve sinif ogretmenligi anabilim dali ogrencilerinin elestirel dusunme egilimi profilleri [The views of primary and science teacher training departments' students about critical thinking]. *Journal of 19 Mayıs University Education Faculty*, (20), 12-25.
- Hicks, L. E. (2004). Infinite and finite games: play and visual culture. *Studies in Art Education*, 45(4), 285-297
- Karadeniz-Bayrak, B. (2014). Ogretmen adaylarinin bilgi okuryazarlik duzeyleri ve elestirel dusunme egilimleri uzerine bir arastirma [A research about information literacy level and critical thinking tendencies of the teacher candidates]. *The Journal of Academic Social Science Studies*, 25(1), 439-456.
- Kawashima, N., & Shiomi, K. (2007). Factors of the thinking disposition of Japanese high school students. *Social Behavior and Personality an International Journal*, 35(2), 187-194.
- Kaya, H., (1997). *Critical thinking skills of the students of university* (Unpublished master's thesis). Istanbul University, Istanbul, Turkey.

- Korkmaz, O. (2009). Egitim fakultelerinin ogrencilerin elestirel dusunme egilim ve duzeylerine etkisi [Effects of education faculties on students' critical thinking tendencies and levels]. *Turkish Journal of Educational Sciences*, 7(4), 879-902.
- Kokdemir, D., (2003). *Belirsizlik durumlarında karar verme ve problem cozme* [Decision making and problem solving in cases of uncertainty]. (Unpublished doctoral dissertation). Ankara University, Ankara, Turkey.
- Kucuk, D., & Uzun, Y. B., (2013). Critical thinking tendencies of music teacher candidates. *Journal of Ahi Evran University Kirsehir Education Faculty*, 14(1), 327-345
- Mercin, L., & Alakus, A. O. (2007). Birey ve toplum icin sanat egitiminin gerekliligi [The necessity of art education for individual and society]. *Journal of D. U. Ziya Gokalp Education Faculty*, 9, 14-20.
- Memduhoglu, H. B., & Keles, E. (2016). Evaluation of the relation between critical-thinking tendency and problem-solving skills of pre-service teachers. *Journal of Educational Sciences Research*, 6(2), 75-94.
- Mertes, L. (1991). Thinking and writing. *Middle School Journal*, 22(5), 24-25.
- Narin, N., & Aybek, B. (2010). Ilkogretim ikinci kademe sosyal bilgiler ogretmenlerinin elestirel dusunme becerilerinin incelenmesi [Analyzing critical thinking abilities of the social studies teachers who work at the secondary stage of primary schools]. *Cukurova University Journal of Social Sciences Institute*, 19(1), 336-350.
- Norris, S. P. (1985). Synthesis of research on critical thinking. *Educational Leadership*, 8, 40-45.
- Ozdemir, S. M. (2005). Assessing university students' critical thinking skills for some variables. *Turkish Journal of Educational Sciences*, (3), 1-17.
- Ozdemir, Y., Buyruk, H., & Gungor, S. (2018). The relationship between teacher candidates' critical thinking tendency and leadership orientations. *Journal of Mersin University Education Faculty*, 14(2), 548-571. doi: 10.17860/mersinefd.434785
- Ozturk, N. & Ulusoy, H. (2008). Baccalaureate and masters' degree nursing students' levels of critical thinking and factors influencing critical thinking. *Journal of Maltepe University Nursing Science and Art*, 1(1), 15- 25.
- Patton, M. Q. (2014). *Nitel arastirma ve degerlendirme yontemleri* [Qualitative research and evaluation methods]. (M. Butun, Trans.). Ankara, Turkey: Pegem A.
- Paul, R., & Elder, L., (2001). *Critical thinking: Tools for taking charge of your learning and your life*. Upper Saddle River, NJ: Prentice Hall.
- Ruppel, R. (2005). The intellectual foundations of critical thinking: Critical thinking at Viterbo. Retrieved from <http://www.viterbo.edu/personalpages/faculty/RRuppel/CritThink.html>
- Sacfi, F., & Demirhan, G. (2008). A determination and comparison of critical thinking levels of students in physical education teacher training program. *Hacettepe University Journal of Sport Sciences*, 19(2), 92-110.
- Saglam, A. C., & Buyukuysal, E. (2013). Critical thinking levels of senior students at education faculties and their views on obstacles to critical thinking. *International Journal of Human Science*, 10(1), 258-278
- Seferoglu, S., & Akbiyik, C. (2006). Teaching critical thinking. *Journal of Hacettepe Education Faculty*, (30), 193-200.
- Sensekerici, E., & Bilgin, A. (2008). Elestirel dusunme ve ogretimi [Critical thinking and teaching it]. *Journal of Social Sciences, Faculty of Arts & Science Uludag University*, 14(1), 15-43
- Taskesen, O. (2012). A research on the university students' hopelessness according to their need to receive art education informally. *Energy Education Science and Technology Part B: Social and Educational Studies*, (2), 237-248
- Taskesen, O. (2014a). Developing interest in art scale and determining the relation between personality type of teacher candidates and their interest in art. *Educational Research and Reviewers*, 9(8), 216-226.
- Taskesen, S. (2014b). *Lise ogrencilerinin kisilik tipleri ile sanata olan ilgileri arasindaki iliskinin incelenmesi* [A study on the relation between personality type of students in high school and their interest in art] (Unpublished master's thesis). Gazi University, Ankara, Turkey.
- Taskesen, O., Naldan, F., & Guler, E. (2017). Investigating the museum and art interests of the students in fine arts and anatolian high schools. *Journal of Strategic Research in Social Science*, 3(2), 1-14.
- Taskesen, S., & Alpan, G. B. (2018). A study on the relationship between the big five personality traits of high school student and their interests in art. *Journal of Strategic Research in Social Science*, 4(1), 57-78
- Tavsancil, E. (2010). *Tutumların ölçülmesi ve SPSS ile veri analizi* [Measurement of attitudes and data analysis with SPSS] (4th ed.). Ankara, Turkey: Nobel.

- Tumkaya, S. (2011). Comparison of college science major students' learning styles and critical thinking disposition. *Journal of Ahi Evran Education Faculty*, 12(3), 215-234
- Turnuklu, E. B., & Yesildere, S. (2005). Turkiye'den bir profil: 11-13 yas gurubu matematik ogretmen adaylarinin elestirel dusunme egilim ve becerileri [A profile from Turkey: Critical thinking dispositions and abilities of pre-service mathematics teachers of 11-13 years]. *Ankara University Journal of Education Sciences*, 38(2), 167-185
- Unver, E. (2002). *Sanat egitimi* [Art education] (1st ed.). Ankara, Turkey: Nobel.
- Yildirim, H. I., & Sensoy, O. (2017) Fen bilgisi ogretmen adaylarinin elestirel dusunme egilimlerinin bazi degiskenlere gore incelenmesi [An investigation of the critical thinking dispositions of pre-service science teachers according to some variables]. *Journal of Gazi University Education Faculty*, 37(2), 611-648.
- Yildirim, A., & Simsek, H. (2006). *Sosyal bilimlerde nitel arastirma yontemleri* [Qualitative research methods in social sciences]. Ankara, Turkey: Seckin.
- Yilmaz, M. O., Taskesen, O., & Taskesen, S. (2016). A study on department of fine arts education students' level of academic motivation according to some variables the relation between their academic motivation and academic success. *Journal of Erzincan University Education Faculty*, 18(2), 1056-1072
- Walsh, C. M., & Hardy, R.C. (1999). Dispositional differences in critical thinking related to gender and academic major. *Journal of Nursing Education*, 38(4), 149-155.
- Watson, G., & Glaser, M. E. (1964). *Watson-Glaser critical thinking appraisal manual*, New York, NY: Harcourt, Brace & World.
- West, J. (2019). Survey Research and Questionnaires. Retrieved from <https://www.researchconnections.org/childcare/datamethods/survey.jsp>
- Yucel, M. S. (2013). Almanca ve ingilizce yabanci dil ogretmen adaylarinin elestirel dusunme egilimleri [Critical Thinking Disposition of German and English Foreign Language Teacher Candidates]. *Journal of Hacettepe Education Faculty*, 28(2), 377-393.
- Yuksel, N. S., Sari Uzun, M. V., & Dost, S. (2013). Matematik ogretmen adaylarinin elestirel dusunme egilimleri [Critical Thinking Tendencies of Prospective Mathematics Teachers]. *Journal of Hacettepe Education Faculty*, (1), 393-403.
- Zayif, K. (2008). *Ogretmen adaylarinin elestirel dusunme egilimleri* [Critical thinking dispositions of teachers candidates] (Unpublished master's thesis). Abant Izzet Baysal University, Bolu, Turkey.
- Zellner, R. M. (2011). *A study of the relationship between instrumental music education and critical thinking in 8th- and 11th-grade students* (Unpublished doctoral dissertation). Capella University, Minneapolis, MN, USA.
- Zonash, R., & Naqvi, I. (2011) Personality traits and learning styles among students of mathematics, architecture and fine arts. *Journal of Behavioural Sciences*, 21(1), 92-104