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Critical Thinking Dispositions of Undergraduate Art Education and History Students

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ABSTRACT

In an ever-changing world, we have been witnessing many developments in our lives. A way to keep up with these developments will be possible through necessary skills such as critical thinking. In the literature, art education is suggested specifically as a contributor for creative skill development and critical thinking skills. The objective of this study was to examine and evaluate students' critical thinking skills based on undergraduate subject area of study. Accordingly, students' critical thinking skills were examined within critical thinking sub-dimensions in addition to variables of gender, age, and year of study. The sample groups consisted of undergraduate freshman and senior students studying Art Education and History. The study was structured according to the relational screening model, and the *Cornell Critical Thinking Test Level Z* (CCTT-Z) was used to measure critical thinking skills. Results of the study revealed that, critical thinking skill levels of the students were low in both cohorts and there was no statistically significant difference according to study areas. The results also showed no meaningful difference in critical thinking skills of freshman and senior students within the group who are studying Art Education. Similarly, demographics such as gender and year of study made no particular difference in terms of students' critical thinking scores. The cohort of 25-30 age group showed a relatively positive difference in terms of age variable as compared to other cohorts. It was concluded that critical thinking skills could be supported by means of designing a curriculum that encourages and develops critical thinking skills and creative thinking through specific educational strategies.

Key words: Cornell Critical Thinking Test Level Z, CCTT-Z, Art Education, Creativity, Literacy, Visual Literacy

INTRODUCTION

In the 21st Century we have been exposed to new technology so much more than any other times of the history we have ever experienced. We observe impactful changes in in social life, economies and local cultures that require new skill sets to deal with new problems. In response to the ever-increasing volume of information, and its speed and access opportunities diversified through technology, we need new tools to filter, analyze, and comprehend what we are exposed to. Lewis and Smith (1993, p. 133) suggested that we need advanced thinking skills to cope with this existential new reality. Learning to learn, creative thinking, reflective thinking and critical thinking skills are at the center of these skills in today's educational objectives (Güneş, 2012, p. 128; Halpern, 1999, p. 69; Paul & Elder, 2016, p. 16). In addition to memory, retrieval, comprehension and effective uses of knowledge; we need another skill to improve life quality that is effective and efficient uses of knowledge to solve problems we face with. How we process and how we teach information makes great difference in literacy and learning processes (Perkins, as cited in Doğanay, 2017, p. 328). Knowledge transmission is no more considered as teaching, and instead problem solving, productive thinking, and critical thinking skills are targeted to support learning how to think as a new educational objective (Seferoğlu & Akbıyık, 2006, p. 193; Wagner, 2008, p. 20). Therefore, recent research focused on skills such as critical thinking, creative thinking, and problem solving.

Learning is no more considered memorizing mere facts, but it is rather using knowledge in productive ways. Productive and efficient learning require individuals who question, analyze and think critically (Aybek, 2006, p. 38). Knowledge production is also a part of creative thinking process that require critical thinking (Demircioğlu, 2018, p. 14). Art education is often pointed out as an effective way to support creative thinking skills (Gel, 1993, p. 300; Ünver, 2016, p. 875). Art education objectives typically include processes such as trial and error, experimenting, analytical thinking and application. Art education also serves to holistic processes that support training of senses, seeing, perceiving relationships, making meaningful connections and creative production (Ünver, 2016, p. 872). All these

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processes are meaningfully connected with critical thinking skills in some way.

OBJECTIVE AND RESEARCH QUESTIONS

Having considered the nature of critical thinking and its common definitions, art education is expected to support critical thinking processes. Within this context the study aimed to investigate and compare critical thinking skills of students with and without undergraduate level art courses. Data collection tool was a survey instrument, the *Cornell Critical Thinking Test Level Z* (CCTT-Z) which was developed in 1985 by Robert H. Ennis, Jason Miller and Thomas N. Tomko (Ennis et al., 2005). In this study, The CCTT-Z scores were evaluated and compared in terms of gender, age, and year of study demographics. The instrument was administered to undergraduate students who study Art Education and to another group of students who study History to compare whether area of study major makes a meaningful difference in terms of their critical thinking skills. The following research questions were considered in relation to the study objective:

1. Is there a meaningful difference between critical thinking test scores of Art Education and History undergraduate students?
2. How does critical thinking test scores of students change in relation to their gender, age and year of study variables?

LITERATURE REVIEW

Critical thinking is an extensive topic and educational objective in many areas of education. We have witnessed to great developments in communication and media in the recent years. These changes are mostly based on visual media and communication that require special attention to visual literacy, analytical and critical thinking skills. Visual signs, symbols and images have great power over our perception and understanding. Visual stimuli have the greatest share on our perception load when compared to any other sources of stimuli. Therefore, visual literacy and critical thinking skills have become even more crucial in learning, understanding, reading, comprehension and literacy skills. Influences of visual literacy and critical thinking skills are not limited to visual phenomena and art education. Information analysis and evaluation are also fundamental academic and citizenship skills for the society (Vitulli and Santoli, 2013).

In a study, critical thinking skills of students majoring in art and other subject areas were investigated. It was found that inquiry based curricular approaches had positive effects on critical thinking. As being a problem-solving based experience, art practices influenced critical thinking disposition of non-art major students positively (Lampert, 2006). In the study, art and non-art major students were compared in terms of critical thinking skills and subdimensions. Freshmen students scored higher on critical thinking compared to seniors on both groups. In addition, freshmen scored higher on some subdimensions compared to seniors. Overall, art and non-art majors showed no significant difference in their critical thinking scores. However, art junior/senior students scored higher than freshmen students in both art and non-art major students in three of the subscales: truth-seeking, systematicity and inquisitiveness. There were no significant differences between juniors/seniors and freshmen on the four remaining subscales: maturity, open-mindedness, analyticity, and critical thinking confidence. The findings of the same study indicated that the humanities, and letters and languages students scored highest on Truth-seeking and Open-mindedness of all the discipline clusters represented. The other discipline clusters being Natural and Physical Sciences; Mathematics, Computer Science, and Engineering; Business Administration and Communication; Social and Behavioral Sciences and Liberal Studies; and undeclared. Business and Communications students scored lowest of all the discipline clusters on Inquisitiveness, Open-mindedness, and Truth-seeking (Lampert, 2006, p. 217).

Nilson et al. (2013) suggested that only creative arts in school curriculum supported development of critical thinking in children and the tools teachers used in this process had great influence. They argued that teachers should learn and understand how they could support and develop critical thinking skills. They also supported their argument by information collected through a research project focused on critical thinking perceptions of teachers, mothers and children. Martin-Raugh et al. (2022) investigated the predictive value of noncognitive skills and critical thinking skills on undergraduate academic performance and based on their findings suggested that noncognitive skills and critical thinking skills could be incorporated into battery of admissions tools (p. 358).

Snyder and Snyder (2008) reported that critical thinking is a learned behavior that require training and practices. Teachers are suggested using educational interventions that require active student participation instead of memorization-based methods. Evaluation methods based on intellectually demanding tasks were also recommended to support critical thinking. Lack of education, limited resources, prejudices, and time limitations were listed as possible obstacles against critical thinking environments. Some possible strategies were project based and cooperative learning activities, structuring highly organized thinking processes and steps, inquiry-based learning activities, and guiding students through critical thinking process. They suggested adapting a student role of not information retainers but rather thinking practitioners.

Emanuel and Challons-Lipton (2012) stressed that creativity and critical thinking were disregarded in the educational policies since curriculum focused rather on course credits, attendance, and course grades. They further argued that if universities aimed to prepare productive individuals for industrial world, creative and critical thinking skills should be primary objectives. Especially, art centered interdisciplinary criticism, integration methods and educational practices were suggested as beneficial interventions to support creative thinking. Pithers and Soden (2000) closely associated effective thinking with critical thinking as a common definition. They also pointed that not all teachers

may be successful at teaching effective thinking strategies. In an experimental study, Nieto and Saiz (2008) showed that a well-organized educational intervention program supporting critical thinking skills increased student performances in various aspects of critical thinking.

In a study about association between thinking styles and critical thinking skills, Zhang (2003) found that certain thinking styles supported critical thinking skills significantly. In a semi-experimental study, a thinking training module had significant effect on preservice teachers' critical thinking scores in sub-scales such as Truth-seeking, Open-mindedness, Analyticity, Systematicity, Critical Thinking Self-confidence, Inquisitiveness, and Critical Thinking Maturity (Kong, 2001). Al-Mahrooqi and Denman (2020) found that college level students developed critical thinking skills to a limited extent. These skills might be more developed in female learners, although whether students are studying in science or humanities seemingly did not impact their critical thinking scores (p. 794). Al-Husban et al. (2022) investigated undergraduate students' critical thinking skills to see whether these skills varied according to their school year, gender, age, and study majors. They found that students' critical thinking levels were below acceptable range and senior students scored higher than freshmen. Females also scored higher compared to males whereas age and study area were not significant contributors (Al-Husban et al., 2022, p. 55).

METHODOLOGY

The objective of this study was to examine and evaluate students' critical thinking skills based on undergraduate subject area of study. Accordingly, students' critical thinking skills were examined within critical thinking sub-dimensions in addition to variables of gender, age, and year of study. The sample groups consisted of freshman and senior students majoring in Art Education and History. The study was structured according to the relational screening model, and the *Cornell Critical Thinking Test Level Z* (CCTT-Z) was used to measure critical thinking skills. This type of descriptive screening studies aim to identify relationships between phenomena, and these relationships are classified and recorded (Yildirim, 2000, p. 56; Karasar, 1984). The information collected through sample groups were aimed to be generalized to the study universe in quantitative measures. Upon analyses, interpretation and evaluation, results are preferable quantified inferences about target populations (Creswell, 2014, pp. 155-156). The relational screening models typically rely on surveys, observations and tests (Şen, 2014, p. 347). In this context, the *Cornell Critical Thinking Test Level Z* (CCTT-Z) was administered to measure critical thinking dispositions of students.

Sampling and Participants

The study was conducted at a large public university located in Bursa, a large industrial city in Türkiye in 2019-2020 academic year. The sample consisted of two discipline groups: Art Education and History undergraduates; and two class rank groups: freshmen and seniors with a voluntary based participation through signed consent forms. The study followed *Bursa Uludag University* ethics guidelines for research in social sciences and education with obtained official permissions. As a selection measure it was important that participants should have demographically represented typical freshmen and seniors so that we could generalize the results to similar populations as a validity measure. Simple random sampling method was used to determine participants that represent the study population.

Critical thinking is commonly associated with analytical thinking, creative thinking and inquiry in the literature. Educational interventions and training programs also focused on and designed based on those aspects of the phenomenon. Art making and creative thinking processes are often suggested as contributors to critical thinking skills. Therefore, Art Education majors (60 total) were selected purposefully to serve study objective as a comparison group to History majors (60 total). In other words, the study was designed as art and non-art group comparison between participants, with clusters of freshmen (30 for each discipline) and seniors (30 for each discipline). Table 1 and Table 2 show gender and age distribution of the participants from both groups.

Data Collection

The cornell critical thinking test level Z (CCTT-Z):
The *CCTT-Z* was developed to measure students' critical thinking skills. It is indicated in the test description that The Level Z test can be used to teach critical thinking skills, to predict students' performance on state proficiency exam, for honors/AP programs, critical thinking courses, college admissions, careers, and employment. This test has been used in curriculum and teaching experiments for appraisal of the critical thinking ability of a group and as criteria for program admission and employment. Level Z is a 52-item, multiple choice test for advanced and gifted high school students, college students, graduate students, and other adults. It may be administered as 50-minute timed or as an untimed evaluation. This is a set of ten test booklets. Level Z assesses: Induction, Deduction, Credibility, Identification of Assumptions, Semantics, Definition, Prediction in Planning Experiment (Ennis et al., 2005).

Data Analysis

SPSS (Version 2020) was used for the analysis of collected data. Student responses to CCTT-Z were processed with SPSS. Participant responses and demographics were tabulated through descriptive statistics as frequencies and

Table 1. Gender distribution of participants

Study major	Year of study	Gender		
		Female	Male	N
Art Education	Freshmen	23	7	30
	Senior	20	10	30
History	Freshmen	18	12	30
	Senior	17	13	30

Table 2. Age distribution of participants

Study major	Year of study	Age							
		17-18	19-20	21-22	23-24	25-26	27-28	29-30	N
Art Education	Freshmen	4	18	4	3			1	30
	Senior			20	4	2	3	1	30
History	Freshmen		14	6	2	4	4		30
	Senior			13	16	1			30

percentages. Data collected from two groups were analyzed as CCTT-Z total scores and subscale scores. No correction formula was applied to the student responses. Responses were analyzed based on frequencies, percentages, and mean values. *T*-test is used for the analyses of data based on two variables. As the first step of the analysis, mean values of CCTT-Z scores were calculated. *T*-tests were then utilized to see whether any differences between t-scores were statistically meaningful. Then, CCTT-Z total scores were tabulated to determine whether art courses and art experiences made a meaningful contribution to critical thinking scores of Art Education students. Independent group *t*-test analysis of CCTT-Z total scores were then utilized to see whether their scores showed variations in relation to the year of study. Independent group *t*-test and One-way ANOVA was used to clarify whether gender and age variables were determinants of critical thinking skills. As the level of significance $p<.05$ value is used to make inferences between differences and relationships.

Validity and Reliability

The *Cornell Critical Thinking Test Level Z* (CCTT-Z) was developed by Robert Ennis, Jason Millman, and Thomas N. Tomko to measure students' critical thinking skills within its subscales. As the first measure of validity the CCTT-Z was determined as an appropriate instrument to utilize and collect data in this study. Content validity of the instrument was evaluated and confirmed through expert opinions (Şenturan, 2006, p. 56). Language equivalence of the adapted Turkish version of CCTT-Z was statistically verified (Şenturan, 2006). Reliability coefficients of the *Cornell Critical Thinking Test Level Z* (CCTT-Z) were reported as between.49 and.87, based on Kuder-Richardson and Spearman-Brown methods.

FINDINGS AND INTERPRETATION

Table 3 shows *t* score comparisons of Art Education and History majors to identify statistical significance of difference between the mean scores of the groups.

As shown on Table 3, *t* scores indicated that there was no significant difference between CCTT-Z *total scores* between the groups. CCTT-Z subscale scores also showed no significant difference between the groups. [($t_{induction(118)}$=-.208, p>.05), ($t_{deduction(118)}$=.264, p>.05), ($t_{credibility(118)}$=-.319, p>.05), ($t_{identification\text{-}of\text{-}assumptions(118)}$=1.758, p>.05), ($t_{semantics(118)}$=1.41, p>.05), ($t_{total(118)}$=.411, p>.05)]. As responding to research question 1, these scores showed that there was no statistically significant difference between critical thinking skills of Art Education and History majors, but they were rather similar.

Table 3. *t* score comparisons of art education and history majors

Subscale	Major	n	t	df	p
Induction	Art Ed.	60	-0.208	118	0.836
	History	60			
Deduction	Art Ed.	60	0.264	118	0.793
	History	60			
Credibility	Art Ed.	60	-0.319	118	0.750
	History	60			
Identification of Assumptions	Art Ed.	60	1.758	118	0.081
	History	60			
Semantics	Art Ed.	60	1.41	118	0.161
	History	60			
CCTT-Z Total Test	Art Ed.	60	0.411	118	0.682
	History	60			

Table 4. *t* score comparisons of freshmen and senior art education students

Subscales	School year	n	t	df	p
Induction	freshmen	30	-0.700	58	0.487
	senior	30			
Deduction	freshmen	30	1.237	58	0.221
	senior	30			
Credibility	freshmen	30	-0.313	58	0.756
	senior	30			
Identification of Assumptions	freshmen	30	0.675	58	0.502
	senior	30			
Semantics	freshmen	30	-0.062	58	0.950
	senior	30			
CCTT-Z Total	freshmen	30	-0.122	58	0.903
	senior	30			

Table 4 shows *t* score comparisons of freshmen and senior Art Education students to identify statistical significance of difference between the mean scores of the groups upon administration of the CCTT-Z.

As shown on Table 4, *t* scores indicated that there was no significant difference when CCTT-Z *total scores* and subscale scores compared between freshmen and senior year Art Education students. [($t_{induction}$=-.700, p>.05; $t_{deduction}$=1.237,

$p>.05$; $t_{credibility}=-.313$, $p>.05$; $t_{identification\text{-}of\text{-}assumptions}=.675$, $p>.05$; $t_{semantics}=-.062$, $p>.05$; $t_{CCTT\text{-}Z\text{-}total}=-.122$, $p>.05$)]. *T* score comparisons showed no statistically significant difference between freshmen and senior year Art Education students meaning that their critical thinking scores and subscale scores were similar.

Table 5 shows CCTT-Z total and subscale *t* score comparisons of female and male students in relation to study major to identify statistical significance of difference between the mean scores of the groups.

As shown on Table 5, *t* scores indicated that there was no significant difference when CCTT-Z total scores and subscale scores compared between female and male students. [($t_{induction}=-.213$, $p>.05$; $t_{deduction}=.964$, $p>.05$; $t_{credibility}=-1.704$, $p>.05$; $t_{identification\text{-}of\text{-}assumptions}=.732$, $p>.05$; $t_{semantics}=.383$, $p>.05$; $t_{CCTT\text{-}Z\text{-}total}=-.112$, $p>.05$)]. *T* score comparisons showed no statistically significant difference between female and male students meaning that their critical thinking scores and subscale scores were similar.

Table 5. *t* score comparisons of art education and history students based on gender

Subscales	Gender	n	t	df	p
Induction	female	78	-0.213	118	0.831
	male	42			
Deduction	female	78	0.964	118	0.337
	male	42			
Credibility	female	78	-1.704	118	0.091
	male	42			
Identification of Assumptions	female	78	0.732	118	0.465
	male	42			
Semantics	female	78	0.383	118	0.703
	male	42			
CCTT-Z Total	female	78	-0.112	118	0.911
	male	42			

One-way ANOVA test was used to identify whether CCTT-Z mean scores of Art Education majors and History majors showed significant variations in terms of age differences as shown on Table 6.

One-way ANOVA test results showed that there was statistically meaningful difference in subscales of *deduction* ($F_{3.910}=.023$; $p<.05$) and *semantics* ($F_{3.136}=.047$; $p<.05$), and CCTT-Z *total scores* ($F_{3.436}=.003$; $p<.05$). *Tukey* test was used to identify what age groups made the differences. According to *Tukey* test results, a significant difference was observed between students' CCTT-Z *total scores* and their age groups. The 25-30 age group was significantly different as compared to 18-20 age group and 21-24 age group ($p<.05$). Accordingly, CCTT-Z *total scores* of students in the 25-30 age group were higher than 18-20 and 20-24 age groups.

There was meaningful difference between students' CCTT-Z *Deduction* subscale scores and their age groups. In addition, students' CCTT-Z *Induction* subscale scores in the 25-30 age group were higher when compared to their scores in 18-20 and 20-24 age groups. Likewise, students' CCTT-Z *Semantics* subscale scores in the 25-30 age group were higher and showed a meaningful difference than their scores in 18-20 and 20-24 age groups ($p<.05$).

Table 7 shows CCTT-Z *total* and subscale *t* score comparisons of Art Education and History major students in relation to the year of study to identify statistical significance of difference between the mean scores of the groups.

Table 6. Variance comparisons of CCTT-Z scores between art ed. And history majors based on age groups

Subscale	Source of Variance	KT	Sd	KO	F	p	Source of Difference
Induction	Within	0.109	2	0.055	2.628	0.091	
	Within	1.615	115	0.014			
	Total	1.724	117				
Deduction	Within	0.086	2	0.043	3.910	0.023*	25-30
	Within	1.258	115	0.011			
	Total	1.344	117				
Credibility	Within	0.062	2	0.031	0.833	0.437	
	Within	5.295	115	0.046			
	Total	5.356	117				
Identification of Assumptions	Within	0.040	2	0.020	0.215	0.807	
	Within	3.432	115	0.030			
	Total	3.472	117				
Semantics	Within	0.073	2	0.036	3.136	0.047*	25-30
	Within	2.215	115	0.019			
	Total	2.288	117				
CCTT-Z Total	Within	0.080	2	0.040	3.436	0.033*	25-30
	Within	0.733	115	0.006			
	Total	0.813	117				

*$p<.05$

Table 7. *t* score comparisons of art education and history students based on year of study

Subscales	Year of study	n	t	df	p
Induction	Freshmen	60	-0.042	118	0.967
	Senior	60			
Deduction	Freshmen	60	2.059	118	0.042*
	Senior	60			
Credibility	Freshmen	60	-0.746	118	0.457
	Senior	60			
Identification of Assumptions	Freshmen	60	1.535	118	0.127
	Senior	60			
Semantics	Freshmen	60	0.261	118	0.795
	Senior	60			
CCTT-Z Total	Freshmen	60	0.576	118	0.566
	Senior	60			

*$p<.05$

As shown on Table 7, *t* scores indicated that there was no significant difference when CCTT-Z *total scores* and subscale scores compared to their year of study [($t_{induction}$=-.042, $p>.05$; $t_{credibility}$=-.746, $p>.05$; $t_{identification\text{-}of\text{-}assumptions}$=1.535, $p>.05$; $t_{semantics}$=.261, $p>.05$; $t_{CCTT\text{-}Z\text{-}total}$=.576, $p>.05$)] except *deduction* subscale scores $t_{deduction}$=2.059, $p<.05$. In conclusion, *t* score comparisons of participants between Art Education and History area of study showed no statistically significant difference meaning that their critical thinking scores and subscale scores were similar.

Research findings showed that there was no statistically meaningful difference between critical thinking scores (CCTT-Z) of undergraduate Art Education and History major students. Likewise, CCTT-Z scores of freshmen year and senior year students showed no meaningful differences between groups besides *deduction* subscale scores. The findings did not support the assumption that creative art making processes support critical thinking disposition. As a response to the research question 1, the sample groups from undergraduate Art Education students and History students did not show meaningful differences in their critical thinking dispositions in any aspects of critical thinking. Further research between various study areas especially with various curriculum contents may provide further insight about the questions regarding critical thinking skills.

Likewise, when freshmen and seniors were compared within the Art Education group neither their CCTT-Z total scores nor their subscale scores (Induction, deduction, credibility, identification of assumptions, semantics) did not show meaningful differences in any aspects of critical thinking. This finding may support a caution to question why creative art making process and art-based curriculum did not make difference in student dispositions about critical thinking. There could be many possible answers to the aspects of the matter in question. For instance, what particular aspects of critical thinking could be supported as part of school curriculum should be examined.

Findings also showed that there was no statistically meaningful difference between critical thinking scores (CCTT-Z) and subscale scores of undergraduate Art Education and History major students in relation to gender and age variables. Therefore, as responding to research question 2, gender variable does not seem to be determinant on critical thinking and its subdimensions. However, when critical thinking scores (CCTT-Z) are compared based on the age groups, a positive relationship was observed between CCTT-Z scores and 25-30 age group. Likewise, there was also meaningful connection between *deduction* and *semantics* subscale scores and 25-30 age group. When the CCTT-Z scores were compared in relation to year of study, a low degree meaningful relationship was observed between *induction* and *identification of assumptions* subscales. However, in general there was no meaningful contribution between year of study and critical thinking scores.

DISCUSSION

Recent developments in media and technology brought about educational practices and we have been witnessing paradigm shifts in education as well. Information is now largely available to public, therefore educational concepts such as school, teacher and curriculum need new definitions and content. Time spent at school, meanings of courses, diplomas and degrees are all need to be reconsidered. The skills needed for today's life and professional environment are different than past, even different from recent past. Developments such as Artificial Intelligence, ease of access to programming, coding and applications made great impact. Knowledge is not a skill anymore but a commodity readily available to anyone. Consequently, we have been experiencing confusions in many aspects of professional life, educational outcomes and settings. However, creativity, creative problem-solving skills and innovation attract more and more attention to find answers to new realities we experience. Critical thinking is one asset to support creative thinking processes and innovation. Art experiences and art courses are a fundamental part of creative processes that also require critical thinking skills.

Although, the current study found no difference in creative thinking skills between Art Education and History majors, there were some studies that provided further insight about the issue in question. Lampert (2006) found meaningful difference between critical thinking skills of art and non-art majors. In another study (Topoğlu and Öney, 2013), critical thinking scores of Art Education majors and Music Education majors were compared and there was no meaningful difference. Özdemir (2005) also found no meaningful connection between students' critical thinking skills and their areas of study. These findings in the literature are consistent with the findings of the current study.

Even though, there was no meaningful difference in Art Education undergraduate students' critical thinking scores, there could be many other variables that may influence the finding. The curriculum content practiced in various schools may differ greatly since courses are taught by the instructors

in a highly liberal manner. General curriculum, mandatory courses and electives are decided by a central government agent, The Higher Education Institution (YÖK), this centralized curriculum may not have considered creative and critical thinking skills or may not have stressed enough. The instructors are highly independent and decide their course contents in a liberal manner, that means course contents, outcomes and curricula should be examined whether indeed critical thinking skills are considered as part of curriculum design. It is also possible that course instructors may not have been aware of critical thinking skills and processes since these skills are taught briefly in a few courses as part of teacher training curriculum. Another reason could be that art studio courses may have been focused more on artistic skill training rather than teaching creative skills and processes.

When we consider relationship between critical thinking and gender relationship there was no meaningful relationship in relation to gender variable and this finding was consistent with some studies (Özdemir, 2005; Özelçi, 2012, Özcan, 2017), although some other studies suggested a meaningful difference that female students scored higher in critical thinking tests (Gülveren, 2007). In this study, a positive relationship was observed between CCTT-Z scores and 25-30 age group. Likewise, there was also meaningful connection between *deduction* and *semantics* subscale scores and 25-30 age group. This finding was also supported with some studies in the literature while other studies found no meaningful connection between critical thinking scores and age variable. Cognitive development, life experience and emotional maturity may be some other factors to be considered.

When the CCTT-Z scores were compared in relation to year of study, a low degree meaningful relationship was observed between *induction* and *identification of assumptions* subscales. However, in general there was no meaningful connection between year of study and critical thinking scores while a positive relationship was expected at the beginning. Art Education students go through various art-related courses and art studio training during their course of study, these courses have reported outcomes such as creative thinking and critical thinking skills. Therefore, students were expected to develop critical thinking skills during their studies. It might be that course contents and curriculum were not designed specifically to meet objectives related to critical thinking skills. In general, the extant studies show that students usually have lower scores on critical thinking tests (Gülveren, 2007; Özcan, 2017).

CONCLUSION

Critical thinking is seen as a fundamental skill to cope with problems we encounter every day, so it is commonly emphasized in most areas of education including science education, literacy education, visual literacy, art education, and creativity education. It has a special value especially in today's visually bombarded social media environments by means of teaching visual literacy skills to handle heavy loads of visual images. Critical thinking is crucial in many tasks and learning processes whenever we feel confused while we are exposed to stimuli. However, it is not simply an analytical process but rather require evaluation and comprehension of complex processes. It is also mostly associated with creative thinking skills since it uses novel cognitive processes much different than logical cognitive processing. Therefore, art experiences are usually deemed to provide these novel cognitive processes which result in creative solutions and innovative ideas.

In this study, critical thinking skills of students were studied within various demographics and critical thinking skills of Art Education students and History students were compared to see any possible outcomes in favor of Art Education students since they are more exposed to art with more art experiences during their study. However, the findings did not support the expectations since there was no direct meaningful relationships in most subscales of the phenomenon. Hence, inferences are rather limited since there might be other variables to be considered in the further studies.

There have been studies that stressed the role of art experiences in creative processes and creative thinking (Adıgüzel, 2002, p. 32; as cited in Dilmaç, 2010, p. 81), these studies stressed that art education supported cognitive processes of critical thinking and problem solving skills (Guilford, 1967; Torrance, 1966). While art is commonly thought as a significant contributor to critical thinking processes, course contents may differ greatly and some practices may be irrelevant to critical thinking processes. Nevertheless, art classes may have potential as long as course objectives and outcomes are designed specifically to support critical thinking skills.

Problem solving, inquiry and creative thinking processes should be adapted to support critical thinking skills in a curriculum. These specific skills may not be a part of art making process spontaneously. Therefore, particular strategies should be developed, utilized and practiced in studio classes. Likewise, Özsoy (2015) clarified some fundamental expectations from art teacher training programs such as a more comprehensive approach to artistic behavior including developing critical thinking skills, aesthetic sensitivity, and a cultural consciousness to preserve cultural heritage (p. 211).

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