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Research Article

The Effect of Active Learning Techniques on Class Teacher Candidates' Success Rates and Attitudes toward their Museum Theory and Application Unit in their Visual Arts Course

Oguz Dilmac[1]
Atatürk University

Abstract

The purpose of this study is to examine the effect that using active learning techniques during museum and gallery visits has on teacher candidates' academic success rates in and attitudes toward their Visual Arts Course. In this study, the importance and requirement of education to take place in museums and art galleries is emphasized. The research was conducted during the fall term of 4th year students' 2013-2014 academic in the Visual Arts Education course of Ataturk University's Kazim Karabekir School of Education's School Teaching Art Education Department. The present study had a semi-experimental design, included an experimental group (n = 30) and a control group (n = 30), and used pretest and posttest measures. Semi-experimental pattern's pretest - posttest test control group model were preferred in this study, realized by using a combined method research. In this study, realized by using a combined method research, semi-structured interview forms were used to obtain the qualitative data. Sixty 4th year teacher candidates studying in the School Teaching Department participated in the research. As the result of the research, it was observed that museums and art galleries have positive effects on teacher candidates' attitudes toward active learning.

Keywords

Museum education • Visual arts education • Raising teacher • Active learning • Teacher candidates

1 **Correspondence to**: Oguz Dilmac (PhD), Department of Art Education, Atatürk University, 25100, Erzurum Turkey. Email: oguzdilmac@atauni.edu.tr

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The first museums, including the Alexandria Museum founded in 3 BC in Egypt and which is perceived as the "House of Museums," were not concerned with collecting or exhibiting artifacts (Karakuş, 2012). Meaning temple of sciences in Ancient Greek, museums first became institutions that exhibit and preserve artworks and materials with the goal to develop and educate society in the 17th century at Oxford University in England (Erdogan, 2003). Museums being used as educational environments began to become prominent in the 20th century. Buyurgan and Buyurgan (2012) stated that museums did not entertain themselves with education in the 1920s, that the objects were simply stored without considering how they should be understood by the visitors until the 1960s. By the beginning of the 1990s, the educational role of museums began to be more heavily emphasized by focusing on collecting objects and on using current collections for educational purposes. This development indicates that museology's area of responsibility has expanded. This development enabled the concept of museology to gain its contemporary meaning as opposed to its previous narrow understanding. When examined within the historical process, it is observed that museums' initial duty was to collect, document, preserve, and exhibit artwork, and only made the transformation into educational environments after a long period of time (Greenhill, 2007; Hein, 2004).

The Educational Role of Museums

Undertaking different functions day by day, museums started to exhibit works for educational purposes beginning in the 1990s. Museums, which had previously been defined as places where cultural pieces of significant may be found (Lewis, 2004), were considered to be both a fundamental and authentic field in education since the 1890s in Europe and USA (Mercin, 2009). One of the first names to include the significance of museums in education is John Dewey, doing so in his 1899 book "School and Society." It is also observed that educational content was developed and applied in various American museums during Dewey's time period. Among these include The Brooklyn Children's Museum in 1899 and Newark Museum in 1909 (serving until 1929). The educational paradigms of a vast number of museums during this period, and especially that of The Brooklyn Children's Museum, were affected by progressivist education theories (Hein, 2004, p. 423).

According to ICOM (International Council of Museums), the educational role of museums is emphasized as follows: "The museum is a non-profit and lasting institution that is under the service of society and development, that is open to public, that makes research on materials used by humans and his environment, that collects and preserves them, that shares information, and that finally exhibits them for such purposes as investigation, education, and entertainment" (Mclean, 1996).

In Turkey, there are three opinions regarding the commencement date of museology. The first opinion asserts that museology began in 1846 when the Ottoman State officially approved the collection of old artworks The second opinion holds that museology began in 1723 when valuable goods found in the Hagia Irene Church as the result of modifications for its use as an ammunition store were exhibited. The third opinion asserts that museology started in 1869 when the term "museum" replaced the term "mecmû'a" (collection), indicating that significance assigned to public exhibitions and public education had increased (Shaw, 2004, p. 19). The first recorded practice of using museums as educational institutions occurred with the establishment of the Imperial Museum by Abdulaziz I, who attached importance to historical artwork as a result of his visit to Europe in 1867. Both Safvet Pasha, the Minister of Education at the time, and E. Goold, the first director of the museum, stated in the museum's catalogue in 1871 that educating the public was to be one of this new institution's purposes. The usage of galleries as educational environments in Turkey is not as old as museum education. Tansuğ (1996) stated that the establishment of galleries in Turkey occurred as recently as the 1970s.

Museums and Galleries as Active Learning Environments

In the second half of the last century, a shift away from teacher-centered approaches has emerged both in Turkey and in the world. Replacing it is constructivism, an approach that endeavors to make the learner the center of the learning process. According to this approach, the learner realizes learning by himself in a social environment. Information is acquired through the assistance of environmental stimuli depending on the perception ability of the learner. According to this approach, the process of learning is more important than the result, and during the learning process, information is formed in a meaningful manner (Kahveci & Ay, 2008).

One of the building blocks of constructivist learning is active learning strategies. Both the active teaching method and the concept of active learning may be defined in a number of different ways. Kyriacou gives the following definition: "that which gives students significant control over the learning process and the process of dealing with their learning activities" (Kyriacou, 1999, p. 125). Being a state of learning in which students are generally active, the purpose of this method is to take the learner out of the passive receiving position and to make him an active factor of the learning activity. Now the learner directs his own learning in the learning process. And the duty of the teacher in this process is to facilitate learning and to be in the position of learner along with his students. While a wide array of techniques, methods, strategies, and materials may be used in active learning the methods used may vary depending on the level, objectives, and subject of the course (Açıkgöz, 2003; Demirel, 1999;

Keyser, 2000). The point to be considered here is that adequate active learning methods should be used in the learning process. The point that should be considered here is that it is important to concentrate on learning through activities that are in accordance with current theoretic approaches (Pekin, 2000). Briefly, active learning gives students the opportunity to own their learning experiences. Of course, for teachers to use these methods, their professional skills must be highly developed. Art education is also affected by this approach. In recent years, research on art education (Bean, 2011; Faust & Paulson, 1998; Inal, 2010; Johnson, Johnson, & Smith, 1991; Musneckiene, 2012; Paulson, 1999; Perdahci & Bozdağ, 2011; Varto, 2012; Yilmaz 2010) have emphasized questioning-based educational strategies that require problem solving and active student participation and cooperation. According to Inal (2010), in a period in which artists generate ideas in a way similar to philosophers by working as activists, education should be structured in parallel to this condition.

Inal (2010) suggests that activities undertaken in art courses should be designed in such a manner that allows them to gain new perspectives through dialogues. When addressed in this sense, it may be asserted that students may gain new perspectives as they enter into a process of more active research toward internalization by perceiving life and all of its realities during visits to museums and art galleries. Visiting a new place, meeting new people, testing new approaches in collecting information and meeting with real things may be very motivating and stimulating for students, and they may be motivated to see what they have learned in school in a new perspective (Hooper- Greenhill, 2007). Thus, it can also be said that visits to museums and art galleries both motivate and stimulate students to expand their horizons.

Visiting museums and art galleries does not mean merely pointless touring the museum. Museums and art galleries should function systematically according to a predetermined plan. Learning may be facilitated by making arrangements so that the education to be provided at museums and art galleries is done so using active learning techniques in order to facilitate learners' abilities to acquire information in a healthier manner, to improve their critical thinking skills, to work as a team, and to increase information retention. "Museum education" is a new concept in Turkey, with "Museum Education" being a post graduate program since 1997 in Ankara University's Social Sciences Institute. Moreover, the course "Museum Theory and Application" has been offered since 2000 to undergraduate students studying in the Department of Art Education within Education Faculties (Güler, 2009; Mercin, 2006). Due to there being such a low number of museum education and museum teachership undergraduate programs and due to the number of individuals having graduated from similar postgraduate programs being so low in relation to the number of museums in Turkey, the duty of using museums and galleries as active educational environments falls mainly onto teachers.

Because museums and galleries provide a more suitable environment for active learning as opposed to memorization based traditional education environments (Wright, 1980), he answer of the question "Are teachers with museum education required?" is a definite "yes." Thus, it is not possible for teacher candidates to reach expected results during their visits to museums and art galleries after they have been assigned as teachers. The inclusion of a course on "Museum Theory and Application" into bachelor's degree programs will be supportive not only for visual arts courses, but also for other courses.

From the literature reviews realized within the scope of the current study, research results realized in Turkey indicate that museum and art gallery visits have positive effects on students (Akyürek, 2011; Atalay, 2011; Demir, 2005; Karakuş & Çoruh, 2014; Sar & Sağkol, 2013; Tosun, 2009; Utku, 2008). In these studies, it is observed that students expand their knowledge on museums and historical artifacts as a result of their experiences during museum visits, which in turn lead to students' attitudes toward the courses to improve. Moreover, both studies conducted in Turkey and abroad show that not only does students' ability to retain knowledge increase as the result of the activities performed during museum and gallery visits, so does their level of experience (Hein, 1996; Hooper-Greenhill, 2007; Rapp, 2005; Yuan, Stephenson, & Hickman, 2015).

As may be understood from the results of the above-mentioned studies, museum visits contribute to students gaining a greater amount of interest in their courses. The importance of museums and art galleries comes into greater prominence when learning by doing and through experimenting is taken into consideration. As such, the current study may be considered important for those policy makers and educators wanting to increase class teachers' sensitivity toward this field, since it is they who are students' initial art educators.

Problem Sentence

According to contemporary learning theories, active participation is required for learning (Güler, 2009). Museum education is absolutely required as it will allow children to be actively involved in the learning process through the realization of versatile learning based on personal experiences. Museums and galleries are essentially alternative educational environments in which learners learn by doing, living, feeling, and enjoying (Adıgüzel, 2006). It is alleged that such alternative educational environments will enable children to gain the habit of sight-seeing beginning at pre-school and will protect the child from rote learning in the future (Perdahçı & Bozdağ, 2011).

In the West, museums have been used as educational institutions since the 19th century (Buyurgan & Mercin, 2005). In Turkey however, a number of problems are currently being encountered in implementing museum education programs due to various insufficiencies (Güler, 2009). In order for Turkey, which is essentially an outdoor museum, to sufficiently benefit from museums' potential educational values, it is first required that there be a sufficient number of high quality educational units in museums. In order to meet this requirement in terms of both quality and quantity, teachers must be trained by new practitioner teacher programs. In this respect, it will be of benefit to include the a course on "Museum Theory and Application" in other departments within Schools of Education, such as school teaching, pre-school teaching, history teaching, social sciences teaching, and science teaching. In Turkey, the two greatest problems in this regard are the fact that museums and galleries are not used to their full potential by teachers and that teachers lack sufficient knowledge on how to use such locations effectively and efficiently (Ata, 2002; Belen, 1992; Mercin, 2002; Suzen, 2005). Since it is required for teacher candidates to graduate only after having received a qualified education and after having obtained skills relevant to their specific area of teaching, it is important to instill in teacher candidates the knowledge that and provide opportunities for them to experience that museums and galleries are, in fact, educational environments by using active teaching techniques. The question, "Do the active learning techniques taught in class teacher candidates' during the unit on museum theory and application in their visual arts course affect their academic success and attitudes toward the course?" constitutes the problem addressed in the current study, with its sub-problems listed as follows:

(i) Is there a difference with respect to academic success between the experimental and control groups' teacher candidates who had attended the Erzurum Archeology Museum and Ataturk University Art Gallery visits organized to facilitate peer education, self-evaluation, poster preparation, concept webs, and cooperative learning from among active learning techniques?

(ii) Is there a difference between experimental and control group teacher candidates' attitudes toward their Fine Arts Teaching course?

(iii) What are the thoughts of experimental group teacher candidates on education in museums and galleries following experimental process?

Purpose of the Research

This study intends to determine the effects of active learning techniques applied in education at museums and art galleries on class teacher candidates' academic success and attitudes toward and their opinions on using museums and art galleries as environments for active learning.

Method and Data Collection

A mixed method was used in this study to assess the active learning techniques used by class teacher candidates in their visual arts course during their visits to museums and art galleries. Mixed methods require qualitative and quantitative research and their data to be integrated in a single study (Cresweel, 2014). Since the use qualitative and quantitative research methods together in a research provide comparative results, the study's reliability increases (Patton, 2015). Thus, a mixed method in which quantitative and qualitative approaches were used simultaneously was chosen for two reasons. The first reason was render the assessment of teacher candidates' perspectives on using museums and art galleries as active learning environments more reliable, and the second was to compare and interpret the findings obtained. In this mixed method study, the qualitative data collection phase followed the quantitative data collection phase and the "Pretest-Posttest control group model" was used as the quantitative research method. Moreover, the qualitative data was obtained using semi-structured interview forms in order to thoroughly determine the experimental group's opinions relevant to the process. Before implementing the study's data collecting procedures, both the experimental and control groups were formed based on the experimental design, and courses along with events based on the active learning approach were provided to the experimental group, with courses suitable to traditional education methods provided to the control group. During the research phase, comparisons were made between the data obtained from the experimental and control groups both before and after implementation.

Operations Applied to Experimental Group

Cresweel (2014) has stated that the operations to be performed in the experimental design must be properly defined. Thus, the phases of experimental operation process are presented below in detail.

(i) The research was designed during the spring term of the 2012-2013 academic year. The measurement tools to be used to perform the research during courses as well as the subjects to be discussed during the period of research, the sources, possible problems and solution suggestions were determined. Moreover, the determination to use teacher candidates in the experimental and control groups was made during the spring term of the 2012-2013 academic year. Data collection took place during the fall semester and the Pretest-Posttest Control Group design was selected from among the experimental models to collect data. The data collection phase was planned to continue for five weeks on both the experimental and control groups in the visual arts teaching course, a class taking place 3 hours a week in the department of school teaching.

(ii) In the operations applied to the experimental group, learning environments based on the active learning approach were prepared. During the research, five of the active learning techniques deemed to support the artistic learning process were selected. These are: peer education, poster preparation, concept webs, cooperative learning, and self-evaluation techniques. The procedures followed during the five weeks of data collection are given in Figure 1.

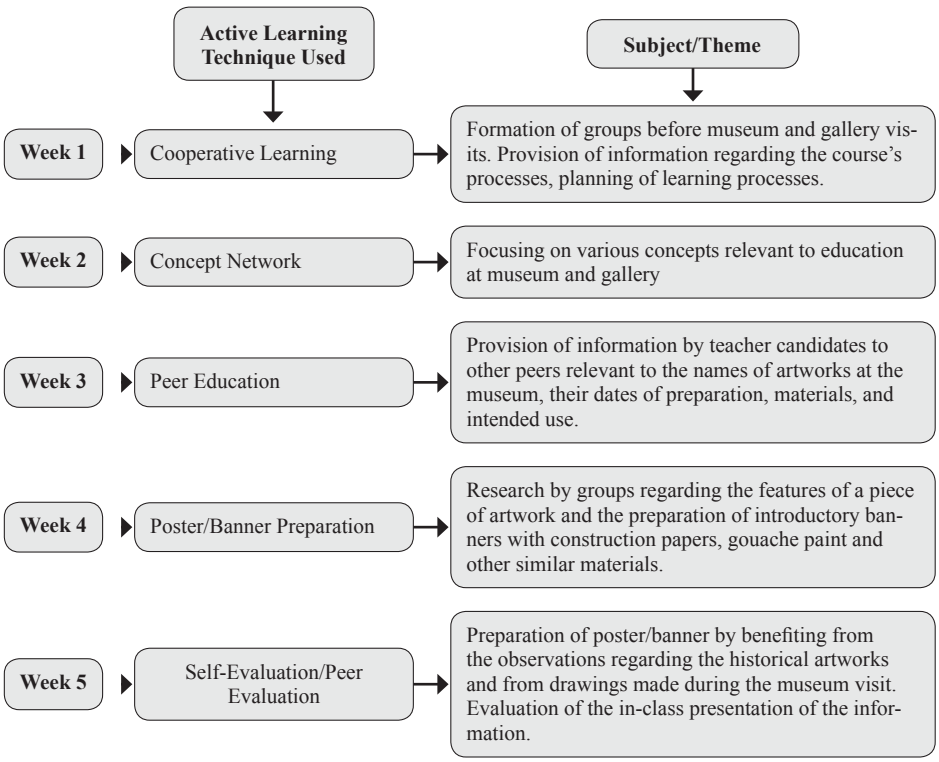

Figure 1. Implementation processes of active learning techniques.

(iii) Self-regulation and covering the complex educational works were considered while preparing the active learning environment. The researcher attempted to provide an environment for the experimental group in which they could both perform research and implement the necessary procedures while also seeking a solution for the problems encountered. Both self- and peer evaluation were used while assessing the procedures implemented during the research phase. Members of the experimental group were able to interact by sharing the information that they had obtained using the cooperative learning technique from among active learning techniques. In accordance with this technique, teacher candidates were able to form small groups and a learning environment allowing them to take responsibility for both individual and group projects was provided.

(iv) In the first week, the visual arts course academic success and attitude test was given as a pretest to both groups. In the following phase, information was provided to the experimental group regarding the course's process and the planning of the learning processes was realized together with the students. Groups of four were formed in the experimental group. Detailed information on active learning techniques was provided to the students of experimental group. In this phase of the research, concept webs were used to help teacher candidates to reflect on the subject and to understand the principles. Various concepts relevant to education at museums and galleries were suggested, and teacher candidates were requested to form new concepts by determining the similarities or connections among these concepts. In this context, by composing the concepts relevant to education at museums and galleries in written form, teacher candidates were able to see the relations among concepts and to easily understand the concepts relevant to museum education and active learning.

(v) The unit of museum and gallery education includes activities to be performed during museum visits. Investigation tours to museums and are galleries' education units took place before, during and after the museum. It was decided for teacher candidates to go on a programmed museum visit during the unit on Museum Theory and Application. Thus, information regarding the procedures to be performed before visiting the museum and art gallery, period of visit, forms to be completed, and materials to be taken along with them (pencil, magnifying glass, crayons, camera, etc.) was provided. Moreover, information on how one should behave in museums was given. Before visiting a museum and art gallery, information regarding the works of art that they would see was given to teacher candidates, and a better understanding of the subject was facilitated through class-wide discussions and through brain storming activities. During this phase, the peer education technique from among active learning techniques was used, and it was requested that teacher candidates inform their peers regarding the subjects required to be considered while visiting an art gallery or museum and then to assess whether the subject has been well understood through feedback.

(vi) In line with the study's intended purpose, the teacher candidates visited the Erzurum Archeology Museum and Ataturk University Art Gallery. An expert working at the museum accompanied them during their visit to the Erzurum Archeology Museum. In the beginning phase of the visit, an activity called "seek and find/clue paper," which is a basic activity in the museum education process, was performed for the teacher candidates so that they may more easily recognize the historical works of art in the museum. This event started by distributing "seek and find" papers, which included pictures of coins, statuettes, holy cookers, cooked pots, and stone artworks of different civilizations, to the teacher candidates. The teacher candidates were then asked to seek and find the real items depicted in the pictures somewhere in the museum and to fill in the blank spaces on the seek and find paper with information

on these works of art. By using the peer education technique from among the active learning techniques, the teacher candidates were asked to inform their peers about the names of the works of art, their dates that they were made, the materials used, and their intended use. The teacher candidates were furthermore asked to make drawings of the works of art that interested them.

(vii) In another activity, the groups were asked to research the civilization that produced the work that interested them, the features of the period during which it was made, and the materials used. They were later given the opportunity to present the information that they found in a systematic manner during class. Another issue dealt with during the research was giving students the opportunity to realize meaningful learning by obtaining information, taking on the responsibility of learning, and controlling that which was to be learned.

(viii) In the following phase, the poster/banner and brochure preparation technique from among the active learning techniques was applied using construction papers, crayons, gouache paints, and other similar materials to make drawings of the works of art observed during the gallery visits. Thus, the teacher candidates attempted to improve their higher level thinking skills within the learning environment. The banners were then exhibited throughout the faculty building.

(ix) While the candidate teachers gave in-class presentations and prepared banners, they made use of the self-evaluation and peer evaluation techniques from among the active learning techniques. Doing so allowed them to assess how they learn things and how much they progressed in their learning.

(x) Teacher centered methods in which students are passive, including narrations, question and answer sessions, and demonstrations from among traditional teaching methods, were used for the control group students. While activities based on active learning were applied on the experimental group, no active learning technique was used during the museum and gallery visits by the control group. Plain narration, discussion, question-answer, etc. were frequently used for the control group. By the end of the five-week implementation, the visual arts course academic success and attitude test was given to both the experimental and control groups as a posttest using the retest method. Moreover, a semi-structured interview form was applied in order to perform a deeper analysis of the opinions relevant to the process held by students in the experimental group.

Data Collection Tools

In this study, two data collection tools were used to collect the quantitative data. The "Success Test" was used to control the effect that active learning techniques had on teacher candidates' academic success, and the "Attitude Scale" was used to determine the effect on their attitudes toward their Visual Arts Teaching course. In addition to these, qualitative data was collected using semi-structured interview forms.

Success Test. A Unit Success Test that measured the degree of gain caused by the "Museum Education Implementations" was prepared taking into consideration B. Bloom's taxonomy to collect the data relevant to the variable of academic success. During the preparation process of the test, various textbooks (Artut, 2004; Buyurgan & Buyurgan, 2007; Buyurgan & Mercin, 2005; Hooper-Greenhill, 2007; Özsoy & Alakuş, 2009) and field expert opinions were used.

While preparing the academic success test, it was considered important to include questions to measure the success relevant to knowledge and comprehension levels, taking care to ensure that the test questions relevant to gains at knowledge level conform to the topic titles relevant to design elements and principles. This test, developed as a multiple choice test consisting of five choices, was used as both a pretest and posttest. The academic success test was presented both to field experts and to an assessment and evaluation expert, who were asked to assess it. The test's validity of scope was ensured by making the corrections suggested by experts. During the development phase of the success test, not only was the validity of scope considered, so was whether or not the test questions represented the scope of the study (Buyukozturk, 2011, p. 168).

Consisting of 35 multiple choice questions, was administered to 62 second-year student who had not attended this course in accordance with the validity and reliability analyses before it was administered to the experimental and control groups. Following the implementation, 35 questions of the test were subjected to article analysis. Ten questions, whose distinctiveness index was lower than 0.30, were removed from the test, thereby decreasing the total number of question to 25. The KR-20 value was calculated for the reliability of success test, and was found to be .89. Its average level of difficulty was found to be .46, and its average distinctiveness was found to be .40.

Attitude Scale. The scale used in the research was five point Likert type attitude scale. During the preparation phase of the attitude scale, the relevant literature was first reviewed. The conceptual structure and main frame of the data collection tool were determined by the assistance of the data obtained from the literature review. A composition whose subject was "Your Opinions on and Expectations of the Visual Arts Teaching (VAT) Course" was written by 76 2nd and 4th year teacher candidates

studying in the Department of School Teaching's undergraduate program. Although the 2nd year students had not previously taken this course, the 4th grade had. In this composition, the opinions considered relevant to one's attitude were determined through content analysis, and the first attitude statements possible to be included in the scale were constituted. The preliminary test was then performed by applying the data collection tool to 58 teacher candidates studying in the Department of School Teaching. The data obtained was subjected to a factor analysis on the basis of the articles, and the researcher attempted to develop a single dimensional scale by selecting those articles whose first factor load value was high. The basic components factor analysis was used to analyze the articles. Only those articles whose factor load value was 0.45 or higher and which were not cyclical (items with a high load value in a single factor and low load values in other factors) were included in the scale. According to the results of the factor analysis, the data collection tool that had first included 40 articles was reduced to 26 after removing 14 articles whose factor load was lower than 0.45, bringing the data collection form to its final form.

Consequently, the data collection instrument prepared to assess the preservice teachers' attitudes explained the total variance at the rate of 45.913%. Thus, the scale is suitable for this purpose. the rate of defining the total variance regarding whether the data collection tool –which has been prepared in order to measure the attitudes of teacher candidates against VAT course- realizes that or not has been 45.913%. Accordingly, it can be said that the scale gathers under a factor relevant to attitude towards VAT course and that it realizes that. Afterwards, the Cronbach Alpha reliability coefficient was calculated in order to determine the scale's reliability. The Cronbach Alpha reliability coefficient of the selected 26 articles was found to be 0.9218.

Semi-structured interviews. The main purpose of using the interview technique is not to test a hypothesis, but to try to understand people's experiences and how they make sense of such experiences (Türnüklü, 2000, p. 544). Thus, semi-structured interview forms were given to the experimental group in order to more deeply analyze teacher candidates' experiences in regard to the active learning techniques applied during the research. During semi-structured interviews, the researcher prepares interview questions, but allows for them to be discussed in a flexible manner during the interview (Ekiz, 2013). The questions to be asked were prepared by reviewing the relevant literature (Buyurgan & Buyurgan, 2012; Dikyol, 2011; Hein, 2011; Ince & Usta, 2011; Uz, 2014; Williams, 1997). The questions prepared were sent to two field experts for examination, and the questions reached their final form after taking the experts feedback into consideration. The questions used in the data collection tools are presented in Table 1. The questions to be asked included 5 open ended questions for the teacher candidates and a number of probe questions so as to obtain thorough information. The questions of the interview are as follows:

(i) What are your thoughts about the use of museums as an educational environment?

(ii) What do you think about museums' contribution to education when used as educational environments?

(iii) What do you think about the difficulties or inconvenience of education taking place in a museum?

(iv) What kinds of events can museums be used for during elementary school education? What are your recommendations on this subject?

(v) Did the visits have any positive or negative effects on your thoughts regarding museums and art galleries?

Explanations were provided to all those who participated in the interview regarding the purpose of the research, its process, what was expected from the participants, the position of the researcher, and the confidentiality of participants' identities. Participants were informed that the information provided would not be used anywhere else. Participants of the experimental group were requested to inform the researcher as to what time they were available. Teacher candidates' opinions were collected only after having received their permission. Participants were asked how they would prefer their opinions to be recorded. Since all the participants specified that they would prefer to provide their answers to the interview in written from, the interviews were recorded in written form. Face-to-face interviews were held with the researcher at predetermined times and in an environment where the teacher candidates would feel comfortable and would be able to state their opinions without hesitation. The interviews lasted approximately 20 to 25 minutes were recorded in written form. Participants were asked to read the interview's record at the end. The data obtained from the semi-structures interviews were then transferred to a computer environment and were analyzed by performing a content analysis. Content analyses classify data obtained by performing data coding under specific, meaningful categories. Thus, it is possible to gather and relate data from different sections that are related with respect to meaning (Yıldırım & Şimşek, 2005). In this study, the data were given meaning by performing data coding, thereby providing significant ease in the arrangement of qualitative data. A code in the form of T1, T2, T3… was assigned to each teacher candidate to protect their identities during the collection and analysis of the data. The data obtained were analyzed by two independent experts. The results were obtained by examining the similarities and differences within the data. In order to determine the consistency of the analyses performed by the experts, the reliability formula [Reliability = Consensus / (Consensus + Dissensus)] suggested by Miles and Huberman (1994, p. 4) was used. The analyses' reliability was found to be greater than 85%. Since reliability greater than 70% is being deemed to be reliable (Miles & Huberman, 1984), the research was deemed to be reliable.

Subjects

Since an experimental design was preferred in the current study, no universe and sample group was created. The experimental study was applied on 4th year students during the fall term of the 2013-2014 academic year in a university's School of Education located in the east of Turkey. The study was conducted during students' Visual Arts Education course's unit on Museum Theory and Application. During research, a group and matching method was used to divide participants into two 4th year groups consisting of 60 teacher candidates. After the groups were balanced in regard to genders and cumulative grade point average (CGPA), one of the groups was assigned as the experimental group and the other as the control group.

Findings Regarding the Balance of the Groups

Distribution of Groups in terms of Gender. The distribution of the preservice primary school teachers in the working group by gender is shown in Table 1. Data regarding the active learning techniques applied during 4th year students' Museum Theory and Application unit based on participants' gender who were taught using traditional teaching techniques are provided in Table 1.

Table 1
Gender Distribution of Experimental and Control Groups

Groups	N		Female		Male	
	f	%	f	%	f	%
Experimental	30	50	12	40	18	60
Control	30	50	11	36.6	19	63.4
Total	60	100	23	38,3	37	61,7

As seen in Table 1, the total number of teachers in the experimental and control groups is 60. Twenty-three of these teacher candidates were females (38.3%), and thirty-seven were males (61.7%). The experimental group was composed of 12 female students (40%) and 18 male students (60%). The control group was composed of 11 female students (36.6%) and 19 male students (63.4%).

Cumulative Grade Point Average Distribution of the Groups (CGPA). The distribution of the preservice primary school teachers in the working group by their cumulative grade point average (CGPA) is shown in Table 2. Data regarding the active learning techniques applied during 4th year students Museum Theory and Application unit based on the cumulative GPA of groups who were taught using traditional teaching are provided in Table 2.

Table 2
CGPA Distribution of the Groups

Groups	n	$\bar{x}$	Std	*t*	*p*
Experimental	30	4,23	.31	0.55	.001
Control	30	4,17	.42		

*$p > .05$.

As seen in Table 2, the experimental group's CGPA was 4.23 and the control group's CGPA was 4.17. A t-test was performed in order to determine whether a significant difference existed between groups' CGPAs. A t-value of 0.55 was found, indicating that the difference was not meaningful. 58 and at the level of significance .05. with a degree of freedom of 58 and significance level of .05. Based on the data, both groups' CGPA was found to be equal.

Findings

In this section, the data obtained from the measurement tools were subjected to suitable statistical analysis, and the findings obtained have been provided.

Pretest Scores of Experimental and Control Groups

The pretest score averages of the experimental group (who were taught using active learning techniques) and of the control group (who were taught using traditional teaching techniques) are presented in Table 3.

Table 3
Comparison of Pretest Success Test Scores of Experimental and Control Groups

Groups	Number of Questions	n	$\bar{x}$	Std	*t*	*p*
Experimental	40	30	14,56	3,13	0.37	.412
Control	40	30	14,17	3.02		

*$p > .05$.

As seen in Table 3, the pretest score averages of both the experimental and control groups are close to each other, and their level of significance is higher than 0.05. There is no significant difference between the two groups' pretest scores. Based on the data, it can be said that both groups are equal with respect to pretest scores.

Table 4
Comparison of Posttest Success Test Scores of Experimental and Control Groups

Group	Number of Questions	n	$\bar{x}$	Std	*t*	*p*
Experimental	40	30	38,33	11,73	3.349	.001
Control	40	30	21,71	11.01		

*$p > .05$.

In Table 4, it is observed that P's level of significance is smaller than 0.05 for posttest, and that there is a significant difference in favor of the experimental group regarding the academic success of teacher candidates at the end of the experiment.

Table 5
Comparison of Pretest and Posttest Success Test Scores of Experimental and Control Groups

Group		Number of Questions	n	$\bar{x}$	Std	*T*	*p*
Experimental	Pretest	40	30	14,56	3,13	-6.18	.001
	Posttest	40	30	38,33	11,73		
Control	Pretest	40	30	14,17	3.02	-4.01	.001
	Posttest	40	30	21,71	11.01		

*$p > .05$.

In Table 5, a significant increase is observed to have occurred in the success rates of both groups. However, the experimental control group's level of success is experienced a greater increase. Accordingly, it can be stated that an active learning environment is more successful compared to traditional teaching methods. The data obtained in the current study is consistent with other studies' data which conclude that an active learning environment has positive effects on students' success compared to traditional approaches (Parvin, 1989; Sokmen, 2000; Uysal, 1996; Yılmaz, 1995).

Findings and Comment Regarding Second Sub Problem

A t-test was applied on the data obtained by the attitude scale used to determine whether a difference exists between the attitudes of students in the experimental and control groups relevant to their Visual Arts Teaching course. The results obtained are provided in the following table.

Table 6
Comparison of Attitude Scores of Experimental and Control Groups Relevant to Pretest VAT Course

	Group	N	$\bar{x}$	Std	*t*	*p*
Attitude	Experimental	30	68,82	8,13	2.121	.836
	Control	30	43,03	5,15		

*$p > .05$.

In Table 6, it is observed that P's level of significance is greater than 0.05, indicating no significant difference in attitudes toward students' VAT course is observed between the two groups before the experiment.

Table 7
Comparison of Attitude Scores of Experimental and Control Groups Relevant to Posttest VAT Course

	Group	N	$\bar{x}$	Std	*t*	*p*
Attitude	Experimental	30	72,11	7,22	.716	.144
	Control	30	46,13	6,01		

*$p > .05$.

In Table 7, P's level of significance is observed to be greater than 0.05, indicating no significant difference between the two groups' attitudes toward their VAT course after the experiment.

Table 8
Comparison of Scores Received by Experimental and Control Groups from the Attitude Scale Regarding Pretest and Posttest VAT Course

Group		n	$\bar{x}$	Std	*t*	*p*
Experimental	Pretest	30	68,82	8,13	-2.301	.054
	Posttest	30	72,11	7,22		
Control	Pretest	30	43,03	5,15	-.492	.488
	Posttest	30	46,13	6,01		

*$p > .05$.

In Table 8, according to the result of the statistical operation performed in order to determine whether a significant difference exists in experimental and control groups' attitudes toward their VAT course both before and after the implementation, no significant difference was observed to exist in teacher candidates' attitudes. However, the attitudes of teacher candidates in the experimental group were found to be more positive compared to those of teacher candidates in the control group. These results are consistent with those of Guler (2009) and Finson (1985) who examined students' attitudes toward their course after visiting a museum. Based on this finding, it can be alleged that active learning techniques have a significant effect on teacher candidates' attitudes when they visit museums and art galleries. The reason that participants experienced increased interest toward their course may be due to the fact that museum visits provide alternative learning options for learners along with the fact that the methods applied during visits are active, lasting, entertaining, and effective.

Findings and Comment Regarding the Third Sub Problem

Semi-structured interviews were applied to students in the experimental group at the end of the implementation period in order to determine their opinions. The documented interview records were examined, and five interview themes were obtained as a result of experts' opinions.

(i) Teacher Candidates' Opinions Regarding the Use of Museums as Educational Environments. The teacher candidates specified that the use of museums as educational environments was a creative idea and that it improves creative intelligence (T1, T6, T7, T8, T9, T10, T11, T12, T16, T17, T21, T22, T23, T25).

> I think the use of museums as educational environments is a creative idea because I believe the environment itself increases motivation, and having the course with a technique that I had never seen before affected me a lot (T1).

Those teacher candidates deemed the use of museums as educational institutions to be a creative idea may arise from their active participation in the education process in an environment in which interaction is high. This result shows consistency with those of Karadeniz and Okvuran (2014) who examined preschool teacher candidates' opinions after participating in museum visits.

It is understood that teacher candidates think that the use of museums as educational environments makes learning more lasting (T2, T3, T4, T13, T14, T15, T24) and that visiting museums supports artistic tastes by improving one's aesthetic senses (T27, T28, T29, T30). On the other hand, one teacher candidate stated a negative opinion regarding the use of museums as educational institutions (T18).

> Museums are cold and stone buildings due to their physical structure. Some are poorly lighted and have too many stairs to climb. Moreover, I don't find it correct for them to be used to educate children because they contain many works of art that may easily be broken. But I think such environments may be used if they are arranged for education (T18).

Although the teacher candidates have informed opinions on that the physical structures of museums, their information needs to be improved in order for them to be able to use them as educational environments (T18, TÖ19, T20). The objects exhibited should be presented with an interesting arrangement so that museums can be used as educational environments. First it is required not to ignore a presentation that is not boring in the order of exhibition by which the objects are being perceived in respect of health and ease of reaching the purpose (Ay & Fidan, 2014). Guisasola, Morentin, and Zuza (2005) stated in their research that educational materials in museum should be arranged in an informative and engaging manner, suggesting possible ways to arrange materials. Thus, the objects in museums and galleries in which active learning techniques are to be applied should be presented to visitors in suitable ways. While preparation such presentations, they should be kept simple and understandable and should consider the features of different age groups.

> Museums may be used as educational environments for a specific subject and purpose. Students learn better through tours, living, and touching (T5).

The teacher candidates had informed opinions on how to use museums for a specific subject and purpose (T5, T26). It is necessary to select museums and galleries suitable for the intended purposes of specific subjects and courses and for schools to work in cooperation with museums. Since life itself is a form of education, learners actively participating in the course and gaining of experience is one of the expected gains (Sar & Sağkol, 2013). The teacher candidates also stated that museums and art galleries would be beneficial for learners to learn by touching, touring, seeing, and experiencing. The results obtained by Demir (2005) in his study support this finding. Thus, it is important to implement and use seek-find and clue papers, crayons, collage studies, brain storming activities, archeological dig pools, jewelry design, and banners/brochures during museum and art gallery visits.

(ii) Teacher Candidates' Opinions on how Using Museums as Educational Environments Contributions to Education. Teacher candidates stated that using museums as educational environments may make their courses even more attractive and interesting (T2, T3, T4, T5, T6, T7, T9, T10, T12, T14, T15, T16, T17, T18, T19), explaining that they think the use of museums as educational institutions increases one's ability to retain what has been learned (T20, T21, T22). Kisiel (2005), in his research on the contributions that informal environments, such as museums, have on education, revealed that such environments aid learners in gaining new information, in giving meaning to the information learned in school, and in their own personal development. In this respect, the results obtained are consistent with those of Egüs and Kesten (2012), who found that when students visit museums their ability to retain information increases. Based on this data, it can be said that the museums enable learners to actively participate in the process. Summarizing five principles to be considered in a learning environment formed by active learning model, Sökmen (2000) stated that the course should conform to students' interests and requirements, that it should motivate the student, and that it should benefit from audio visual settings. At museums and galleries, where visual works of art are available, the fact that students were highly motivated may have made this implementation more attractive for them. Other opinions of students regarding the contributions that using museums as educational environments have on education are as follows:

> Using narration while teaching lessons, like what's used in our courses, is sometimes insufficient. I think demonstrations enable information to be more lasting by making the course more attractive. So, I think the use of museums as educational environments will make positive contributions. I believe that children will become searching and learning individuals moving away from rote learning (T2).

> I think students who learn by seeing and touching works of art will be more lasting, and that the importance of museums is high in learning our history. To realize this, it is first required for the teachers to have sufficient knowledge during visits to museums. Moreover, teachers should be aware of museum education. I also think that parents, in addition teachers, should be aware about what's going on (T1).

It can be alleged that the teacher candidates specified this opinions after realizing the necessity of museum education following their visits to the museum and gallery and after realizing how much work is imposed on teachers due to the fact that museum employees' lack of information and number (T1, T8, T11). Those directing the process by guiding the learners before, during, and after visits are the teachers. Thus, it is important for teachers to have sufficient knowledge on how to make best use of a museum visit intended for education.

(iii) Opinions of Students on the Difficulties/Inconveniences of Having Education at a Museum. When teacher candidates' opinions on the difficulties or inconveniences of having education at museums and galleries are examined, it is found that most of them think that the most encountered difficulties are that of accessing museums (T2, T6, T7, T9, T10, T16, T17, T22, T23, T29) and that pertaining to the lack of educators employed in museums (T4, T5, T11, T12, T13, T14, T26). Moreover, they also specified that the fact that museums are not easily found everywhere and do not contain sufficient physical facilities makes teachers' work difficult (T15, T18, T19, T20, T21, T24, T25, T27, T28, T30). Suzen, in her his study (2005) on both principals' and teachers' opinions regarding the use of museums and art galleries for education were examined, concluded that crowded classes and teachers with insufficient knowledge and experience regarding museum education are the most encountered problems. The teacher candidates in the current study stated the following regarding the difficulties encountered during museum visits:

> The use of museums as educational environments is an extremely positive idea, but the fact that they are so far away from schools and transportation issues are some of the difficulties encountered. Moreover, museums cannot be benefited from much in the countryside or in villages (T22).

The fact that the most commonly opinion held by teacher candidates is that the biggest problem facing education at museums is transportation to museums is striking. This may be due to the fact that they are of the opinion that they will not be able to go on such visits once they become teachers due to the lack of museums in rural areas in Turkey. As a solution, visits to museums by service buses may be suggested Another possible solution would be to establish small museums inside schools by implementing the "School Museums Directive" of the Ministry of National

Education put into force in 1986 (Ministry of National Education, 1986). Students' parents, local authorities, and NGOs should provide support for the establishment of these school museums. By this way, active participation of the society will be enabled, which will aid in developing a wider museum consciousness. Moreover, the inclusion of learners in this process may help their active cognitive inquiry, analysis, and synthesis abilities, as well as their creativeness and discovery. Learners will understand by actively participating and then discovering the realities, which will thereby make it easier for them to recall what they learned.

> I think most of the museums are not suitable for being used as educational environments as a result of their structure and rules. The fact that classes are so crowded, and the problems in controlling children may make education at museums difficult. And I think the teachers who are to give such education in museums should be receive special training (T14).

As the teacher candidates began to realize the necessity of museum education as a result of their museum and gallery visits, they may have also developed the opinion that teachers should be more informed and aware of this subject (T1, T3, T8). For, it is the teachers who are responsible for establishing cooperation between museums and schools and for guiding learners before, during, and after their visit to museums. Thus, in order to realize a successful and educational museum visit, teachers must have sufficient information on how to proceed.

> The things that make education in museums difficult include transportation issues, difficulty obtaining permission slips from parents, the fact that museums' physical features actually hinder education and the fact that classes are so crowded (T2).

Teacher candidates stated that crowded classes were another problem encountered when trying to use museums as centers for education. Similarly, Güven (2009) also stated that classes were generally subject to warnings during museum visits and that students would usually push each other when trying to pass through doorways. As such, teachers should definitely make good plans and prepare students beforehand so that they conduct themselves appropriately during museum visits.

(iv) Teacher Candidates' Opinions on which Kinds of Events Museums may be Used for in Elementary Schools. When teacher candidates were asked their opinions as to which kinds of events museums may be used for in elementary schools, they stated that museums and art galleries may be used to teach rules of social conduct (T1, T2, T5, T6, T8, T9, T10, T11, T12, T13, T20, T26, T27, T28). They also stated that they could be used to build relations between the subjects taught or to be taught in their class, such as social sciences and visual arts, and in celebrating or commemorating special days and weeks (T3, T4, T14, T15, T16, T17, T18, T19, T29). Teacher candidates mentioned the following in regards to this dimension:

> Child can be taught proper social conduct by telling them how to conduct themselves during museum and art gallery visits. Moreover, museums may also be used to advance children's social development (T12).

> Students can be asked why some of the more special works of art or historical places were made and where they could be used. They may even be made to draw these objects. They could be asked how to make the materials used in the works they see and these materials could be made with children in class. Imitations of the statues seen at the museums could be made using dough and they could learn songs about the locations they visited (T18).

> The children may be made to perform plays at museums or to come up with stories using drawings of the works of art they see at museums. This way, what they learn in museums may be better retained (T7).

Teacher candidates stated that dramatizations may be performed during museum visits (T7, T21, T22, T23, T24, T25). In related studies stating that museums are places that may provide new, effective, and interesting teaching facilities to both learners and teachers, performing plays is being suggested (Alkis & Gulec, 2003; Onder, Abacı, & Kamaraj, 2009). Eğitmen (1995) also found in his study that creative plays realized have multidimensional benefits for learners, emphasizing their necessity when using museums as centers for education. Such plays may be related to the daily behaviors of people who made the works of art or may be take the form of reenactments of processes used to make the works of art. For instance, such plays may even respond to a question asked by the teacher, such as: "How were tear bottles used during the Roman period?"

(v) Effects that the Visits Had on Teacher Candidates' Opinions regarding Museums and Art Galleries. A positive change was observed in the opinions of teacher candidates in the experimental group regarding museums and art galleries after using such active learning techniques as cooperative learning, concept webs, peer education, poster/banner preparation, self-evaluation, and peer evaluation. (T1, T2, T4, T5, T6, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T28). Supporting these findings is Karadeniz and Okvuran's study (2014). Teacher candidates' opinions on the effects that museum and art gallery visits had on their previously held opinions are as follows:

> Before, I used to think that museum visits were boring. My opinion toward museums experienced a positive changed after these visits. While they used to be places that I only visited once every two or three years, I started to see them as places where education could be held (T28).

> I think my opinion was positively affected. I found this idea very creative. I think I've developed a greater sensitivity toward museums. I also think that establishing

> a small museum in classes by collecting old goods will have a positive effect on education (T14).

Teacher candidates partook in a "seek and find and clue paper" event, drew pictures of objects that they had observed, made posters, banners, and brochures related to museum and art gallery that they had visited, and made presentations after having researched the works of art that they saw at the museums. Based on the findings, it can be alleged that such active learning techniques as approaching facts with curiosity and suspicion, conducting research, learning by experiment positively affected teacher candidates' opinions.

> I had never visited a museum before. So, I didn't have any information. But now I do have some opinions about museums (T3).

The teacher candidates stated that the museums allowed them the opportunity to learn by touching and seeing real-life objects (T3, T7, T8, T20, T22, T23, T24, T25, T26, T27, T28, T29, T30). According to the results of various studies, learning activities that address different senses increase students' creativity and drive, which will, in turn, knowledge retention (Belen, 1992; Perdahci & Bozdag, 2011; Yuan, Stephenson, & Hickman, 2015). With this in mind, the fact that museum visitors not only see objects, but are able also use other senses to establish a relationship with them makes museums and art galleries active learning environments.

> Our visits to the museum and gallery didn't affect my opinion positively, because I found the museums boring (T21).

There are also teacher candidates, albeit a few, who stated negative opinions regarding the use of museums as educational environments (T21). Such negative opinions may be a result of the large number participants in the experimental group and the physical features of museum visited. The number of experimental group to which the implementation was made, and from the physical properties of the museum visited.

Discussion

The goal of this study was to examine what effects activities following active learning principles applied in a "visual arts teaching" course had on school teacher candidates' and academic success attitudes toward the course; these being two of the study's sub-problems. With regards to academic success (G.S.Ö.B.T.), the data showed that the active learning techniques used during museum and gallery visits positively affected teacher candidates' academic success. As for candidate teachers' attitudes toward their visual arts teaching course (G.S.Ö.T.Ö.), no significant

difference was observed between the control and experimental groups' pretest results when the pretest and posttest average scores are considered. Based on this finding, it can be concluded that learning environments based on active learning are effective on students' success levels and attitudes.

Regarding the third sub-problem of the study, teacher candidates' opinions from the experimental group revealed that they had reached the conclusion that using museums and art galleries as educational environments is a creative idea, that such environments supported creative intelligence, aesthetic sense, and artistic tastes so as to make the knowledge learned more lasting. Lending support to this finding, is Karadeniz and Okvuran's study (2014) on preschool teacher candidates' opinions on the results of museum visits, who found that preschool teacher candidates' reached the conclusion that museum visits act to improve creativity.

In the current study, the researcher found that t museum and art gallery visits helped to make the course more attractive in the eyes of teacher candidates. The researcher also found that teacher candidates think that using museums and art galleries to promote active learning will help students to improve their critical thinking skills by increasing opportunities for the learning environment to intersect with real life, thereby facilitating learners to become active, creative, and social learners. Teacher candidates were also found to believe that such visits would help learners to embrace the responsibilities needed for learning, that the role of the teacher in this environment is that of a guide and supporter, that the methods used not only increase creativity and motivation, but also enable active participation. Aydede and Matyar found similar results in their study (2009), in which they concluded that active learning approaches affect the students' success at the cognitive level.

It can be said that using active learning techniques, such as peer education, self-evaluation, poster preparation, concept webs, cooperative literature during museum and gallery visits, are effective in moving teacher candidates toward different and creative ways of thinking about using museums and galleries as centers for education. Active learning covers all the events that enable students to perform tasks and to reflect on what they have done (Aydede & Kesercioglu, 2012). Students are able to implement the concepts that they have learned, search for relations among facts allowing them to compare and then resolve contradictions between their previous knowledge and what they have learned. Such activities remove learners from the passive listener position in the learning process and enable them not only to actively undertake responsibility in the learning process, but allows them the opportunity to make their own choices in their learning process (Jayawarda, Hewagamage, & Hirakawa, 2001). In this vein, teacher candidates were directed to use their cognitive abilities while partaking in the activities realized before, during, and after

the museum and art gallery visits. The teacher candidates stated that their attitudes toward museums had experienced a positive change and that visiting the museums helped them to better retain what they had learned since they were allowed to learn by doing and experimenting. These findings are supported by the results of the studies conducted by Aydede and Kesercioğlu (2012) and by Phillips (2005), in which they found that self-arrangement skills increased learners' learning skills.

Concept webs, one of the active learning techniques used in the study, were found not only to increase learners' thinking skills, but also to contribute to learners' understanding and ability to give meaning and definition to subject and content that one faces while subject to museum and gallery education. Concept webs enable learners to review what they have learned and to establish relation among them. Subjects learned are listed as main and sub-headings. And the relevant ones are connected to each other by various marks (Acikgoz, 2003). By the beginning of the experimental process of the study, teacher candidates were observed to interact as small groups helping each other in their realization of the learning process. When learning is based on cooperation, students are able to realize learning according to their own individual differences by constructing their own learning within multiple learning environments. Discussion with other group members, solving problems, finding new solutions, determining faults, and making corrections help to develop students' higher level thinking skills (Ekinci, 2010).

Moreover, the applied active learning techniques were observed to facilitate subject diversification and teacher candidates' abilities to conduct different types of technical research on concepts that arose relevant to the given theme. Active learning techniques were also observed to positive affect idea sharing and to improve critical thinking skills by motivating teacher candidates during the course. Similarly, previous studies focusing on active learning techniques' effects on course effectiveness found that the success of an experimental groups taught using active learning techniques was higher compared to that of the control group (Akay & Kocabas, 2013; Aydin & Alakus, 2004; McNeal, 2001; Parvin, 1989; Terzioglu, 2004). Another finding is that a minority of teacher candidates regarded museums' physical environments as not being conducive to the active learning approach. Moreover, the most negative opinion observed was regarding the difficulty of transportation to museums. This problem may be solved by taking the learners to museums and galleries by service buses.

Finally, teacher candidates stated the problem of there being lack educators employed in museums and that teachers themselves do not receive sufficient education in order to provide education at museums or art galleries. As a result, they feel that the Museum Theory and Application course should be added to the

school teaching undergraduate program, emphasizing that this course is required not only in art teacher, but also a wide variety of departments, such as school teaching, preschool, history, science, and social sciences. Various studies also supporting this finding (Ata, 2002; Gokmen, 2004; Gulec & Alkis, 2003; Mercin, 2002; Metan, 2007; Suzen, 2005). It can be said that although active learning techniques should be used to educate prospective teachers, they will only be effective in the field of teacher education when deficiencies are overcome. Consequently, learning environments in which active learning techniques are applied at museums and art galleries were observed to be more effective than those techniques based on traditional teaching approaches. Based on these results, it is suggested that provide museum and gallery education be provided, itself which requires a specific process, and that "Museum Theory and Application" be taught as a single-semester course for four hours during the school teaching undergraduate program. Further recommendations include performing experimental studies on active learning over a larger sample group in other departments with Schools of Education and to provide in-service education to teachers at museums through the cooperation of the Ministry of Culture, the Ministry of National Education, and the Council of Higher Education.

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