

Full Length Research Paper

An experimental study on effectiveness of Integrated Curriculum Model (ICM) in Social Studies education for gifted and talented learners

Özlem Atalay and Nihat Gürel Kahveci*

Istanbul University, Hasan Ali Yücel Faculty of Education, Department of Gifted and Talented Education, Turkey.

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This experimental study examines the effects of Integrated Curriculum Model (ICM) on 4th grade elementary gifted and talented students' academic achievement, creativity and critical thinking (Control Group N= 10, Experimental Group N= 11) in the social studies classroom context, in Istanbul, Turkey. Integrated Curriculum Model was utilized to create a social studies curriculum unit named *luckily it is present* that both cover Turkish Ministry National Education aims and standards and goes beyond for that for gifted and talented learners in accordance of ICM. Research was conducted in a unique state school for identified gifted and talented learners by the Ministry of National Education branch named Counseling and Research Center for identification by means of multiple scales. Prior to the experiment both experimental and control groups were attained equally in terms of use of scales academic achievement, creative thinking skills test and critical thinking skills test's pre-test results. As stated above, Integrated Curriculum Model was utilized to create a social studies unit and implementation of its instruction in the experimental group while no intervention was made for the control group. After 8 weeks of implementation of the social studies unit, results of the experiment indicated that there was a significant difference in terms of academic achievement, creativity, and critical thinking between treatment and comparison groups.

Key words: Social studies, gifted and talented education, curriculum and instruction.

INTRODUCTION

Curriculum intervention or differentiation for the gifted and talented learners has been articulated among educational researchers for about forty years. Searching for

appropriate curriculum for gifted learners has become an important issue of gifted and talented education. As Van Tassel-Baska (1986) stated there have been many efforts

*Corresponding author. E-mail: nihatgurel@yahoo.com.

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being voiced in general principles on curriculum e.g., Gallagher's (1975) content modification for curriculum in the content areas, Renzulli's (1977) differentiated curriculum model, Meeker's (1969) Guilford Structure of Intellect, Maker's (1982) model for differentiation for curriculum along with Kaplan's (1986) the Grid Model and Parallel Curriculum Model (Tomlinson et al., 2002). In this study, among all curricular efforts for gifted and talented learners, Integrated Curriculum Model has been considered as responsive for social studies since previous research studies' findings (Little et al., 2007). As Little et al. (2007) suggest, "social studies processes and habits of mind noted previously represent critical elements of curriculum and instruction for all learners, yet they also—when combined with other recommendations for differentiation—can form a foundation for effective curriculum for high-ability learners (p. 274). When it comes to social studies, it is clear that some gifted students have natural talents in the areas of social studies disciplines (Van Tassel-Baska and Stambaugh, 2006, p. 141). In the scope of social studies disciplines, gifted students need to encounter new set of issues in the realm of complex knowledge base of social studies. Gifted students should also be guided while solving those encountered issues developing values along with higher order thinking skills while being effective citizens for their countries and the world at large (VanTassel-Baska and Stambaugh, 2006). Problem-solving skills and higher order thinking skills become evident as can be seen in Turkish Ministry of National Education's social studies curriculum and the natural link between social studies and gifted and talented education. Integrated Curriculum Model has been developed for gifted learners. Specifications of the social studies unit within the framework of ICM are summarized by Little et al. (2007) "The ICM provides the basis for a deep integration of the elements of conceptual understanding and critical reasoning with advanced content in social studies" (p. 274). They explain ICM and its instructional dimensions "curriculum and instruction designed within the ICM framework engage students actively exploring, analyzing, and discussing advanced materials and topics" (p. 274). Integrated Curriculum Model can provide a curriculum framework along with national curricula, in the content areas. Despite some research exists on efficacy of differentiated curriculum and instruction for the gifted and talented learners in social studies (Gallagher et al., 1992; Gallagher and Stepien, 1996; Little et al., 2007), little or no research exists in Turkish gifted and talented education context. This study is an attempt to open a discussion for new research studies on curricular and instructional interventions and differentiation by means of investigating of effectiveness integrated curriculum model in social studies in a unique state elementary school context in Istanbul, Turkey.

THEORETICAL FRAMEWORK

It is important to know the characteristics of gifted and talented individuals so that they can use their potential. A review of the relevant literature demonstrates that there are many different definitions of intelligence; however, it is commonly accepted that intelligence is inherited and it has a dynamic structure. Since intelligence is dynamic, it does not have any unchanging features. The environment that we inhabit and the stimuli to which we are exposed cause differences in the development of the brain. As mentioned above, even though there is no unique definition for giftedness, Roeper (1982) argues—as cited in Silverman—that giftedness includes emotional traits and he defines giftedness as: "a higher level of awareness, more sensitiveness and a greater talent of transferring perceptions into cognitive and affective experiences" (Silverman, 1993, p. 3). Callahan (2007) suggests the most widely accepted alternative definition which is known as three-ring conception. In this conception, Renzulli (1978) defines giftedness as a convergence of three important components that create giftedness. These are: Task commitment, above-average ability, and creativity.

In relation to giftedness and social studies earlier said by Renzulli (1978), Popham (1971) put similar thoughts on both giftedness and general characteristics of gifted students:

Giftedness is multifaceted; no single criterion provides a valid measure of its presence in any individual. Yet, perhaps more than anything else, the gifted person is a creative person. Traits of the creative mind include (1) sensitive perception of details in the world of nature and in the world of man; (2) awareness and concern about unsolved problems (an important attribute of reflective reasoning); (3) fluency of thought; (4) ability to concentrate, to enter whole heartedly and personally into an experience; (5) integration, or the ability to perceive structure or a new design in a scene, setting, or situation; (6) ability to analyze and to integrate abstract concepts and generalizations (an ability that is at the heart and core of reflective reasoning); (7) vision to go beyond the facts and through insight discern new implications ;and (8) originality and individuality (Popham, 1971, p. 8).

Since gifted and talented students have different perspectives and an advanced insights, these individuals may have the potential to be the leaders of the future. Thus, social studies should be emphasized in the education provided to gifted and talented learners. Education programs for gifted and talented learners have been initiated with the thought that today's exceptionally gifted students will be future leaders in business, politics,

science and other areas of specializations.

Social studies is defined as combination of social sciences for citizenship education and educating the students equipped with problem solving and thinking skills. As Öztürk simply put (2005) it, "Social studies combines knowledge and methods from social and human sciences and use them to raise active citizens who have problem solving skills and are able to make decisions based on information in the unstable circumstances of their country and the world" (Öztürk, 2007, p. 24). The modern world changes at a fast pace, and amounts of information are less significant than learning and using information to adapt ourselves to change and solve our problems. As Van Tassel-Baska and Stambaugh (2006) show, "some gifted students have natural talents for study and growth in social studies disciplines. They should be identified early and guided into the most intensive experiences in social studies throughout their school years" (p. 141). They add other gifted students also need to learn social studies to develop "their competencies and commitment" as citizens. Van Tassel-Baska and Stambaugh (2006, p. 141). Based on research studies by Stewart (1985) and Delisle (1991) state the insufficiency of common social studies practices for gifted students. Thus, educational programs should be arranged according to gifted and talented students' educational needs. They should be given the opportunity to experience the relationships between the individual and society. They should also be allowed to discover themselves and their environment by developing personal awareness and sensitiveness (Kabapınar, 2012, p. 3).

While stressing out the importance of social studies instruction for non-gifted students, it should also be emphasized that social studies teaching is an important component of the education of gifted and talented learners (Steward, 1985; Popham, 1971; Delisle, 1991). The natural connection between the goals of the education offered to gifted and talented students and the goals of the social studies curriculum is remarkable. As Steward (1985) emphasizes, the objectives of the two fields (questioning, critical thinking, decision-making skills, creativity, problem solving, and leadership qualities) correspond with each other. As cited in Delisle (1991), Breiter also claims that: "since social studies is an area of the curriculum which allows for almost unlimited diversity, it is excellent vehicle for gifted education" (Delisle, 1991, p. 176).

Social studies curriculum can involve or suggest highly complicated and suitable options that will draw the attention of gifted and talented learners and give them the opportunity to make use of their abilities (Popham, 1971). This course gives them the chance to use their advanced reading, writing and conversational skills and the capability to make a discussion, along with controlling

their meta-cognitive functions through investigative and cooperative projects that will improve their creative and critical thinking skills. Social studies allow them to structure their strong foundations of knowledge with knowledge of certain subjects (e.g., politics, history, geography, economics) that are directly associated with daily life. It makes interdisciplinary connections, involving different branches of social studies that specifically interest gifted and talented students: anthropology, law, archeology and sociology. It can easily be associated with historical, cultural, political and geographical issues including literature and science. It is necessary and important for gifted and talented learners to make interdisciplinary connections since it will enable them to better understand the holistic nature of historical knowledge and knowledge that comes from social sciences disciplines. Interdisciplinary connections will enable students to participate in the active learning process and have positive influence on their attitude towards the lesson and the information they have will be meaningful. Gallagher (2006) mentioned the most significant reason that gifted and talented learners should be provided an education that is suitable for them when he claimed that social studies is supposed to help students understand the society in which they live. The steps taken to help gifted and talented individuals achieve their best are important in both personal and social terms. If education is structured successfully, both of these necessities will be fulfilled.

Social studies courses are structured and differentiated with this question in mind: Which skills should gifted and talented learners acquire to enhance their ability to adapt to change?

Differentiation in education can be defined as fulfilling students' needs. Since we experience rapid change in modern world, we need individuals that can adapt themselves to these changes and have strong creative thinking skills enabling them to contribute to the generation of new ideas (Maker and Shiever, 2010). In another definition, Van Tassel-Baska (2008) defines differentiation:

Differentiation is based on how gifted learners differ from the norm in respect to precocity and complexity, the two most powerful and research-based distinctions that we can identify. Thus, differentiation in curriculum comes from being responsive to those very characteristics—offering a curriculum that is advanced, emphasizing higher level thinking and problem solving and exposing students to the world of great ideas, issues, and themes. (Van Tassel-Baska, 2008, p. 3) Simply put, differentiation can be defined as any curricular and instructional efforts to meet students' needs.

As stated above, creativity could be considered as part

of giftedness for many definitions in the area of gifted education. Creative individuals can find alternative solutions for problems and advance brand new ways of thinking to new problems or use the way of solution of a previous problem. Gifted and talented learners' thoughts and behaviors are defined as "creative processes," and their valuable products are creative achievements (Gardner, 1988, p. 9). Creativity is hidden in the products of the mind that reflect the uniqueness of an idea (Yamamoto, 1956). Creativity has a wide scope since it requires a variety of operations, products and mental skills such as reasoning, meta-cognition, memory, assessment, critical thinking, decision-making, and divergent thinking (Sternberg, 1984). Creativity may be defined as the generation of new ideas. To generate a new idea, one needs to get away from conventional thought and come up with an extraordinary and unique solution to a problem. A person that seeks creative solutions must first focus on the discovery of the problem. In this respect, social studies is a discipline that is suitable for developing creativity or in other word creative thinking. It enables students to think of alternative solutions for scenarios that are based on real life problems in context of the unit subjects in the curriculum. This is very important for getting creative results from the course. As Runco (2007) explains that there are many diverse definitions of creativity similar to definition and conceptions of giftedness. At the same time, he contends that there are two things about creativity. First whereas labels can be different "creative products are always original" (p. 200). Secondly, creative things can be reached more than original since its capacity to solve a problem or problems makes it effective (Runco, 2007). On definition of creativity Kaufman and Sternberg (2006) adds similarly diverse nature of understanding the concept and definition of giftedness, Kaufman and Sternberg (2006) suggested some common generalization of creativity as follows:

Creativity involves thinking that is aimed at producing ideas or products that are relatively novel and that are, in some respect, compelling. (2) Creativity is neither wholly domain specific nor wholly domain general. It has both domain-specific and domain-general elements. The potential to be creative may have some domain general elements, but to gain the knowledge one needs to make creative contributions, one must develop knowledge and skills within a particular domain in which one is to make one's creative contribution. (3) Creativity can be measured, at least in some degree. (4) Creativity can be developed, in at least some degree. (5) Creativity is not as highly rewarded in practice as it is supposed to be in theory. (Kaufman and Sternberg, 2006, p. 2).

Similarly, in the scope of higher order thinking skills,

critical thinking skills, creativity and problem-solving skills were stated as important components of the social studies curriculum in Turkey. Moreover, irrespective of the content area, critical thinking is stated as important for the education of gifted and talented students. Even though many definition is available for critical thinking, as cited in Dixon (2002), Paul defines critical thinking "as a process by which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards on them (p. 224). Davis and Rimm (1998) explain critical thinking as two main definitions. One of them is about critical thinking as evaluation: "evaluating biases, qualifications, and consistency of speakers, opinions, ambiguities, whether conclusions follow, and others" (p. 246). Second definition they stated is problem solving: "critical thinking as problem solving includes teaching students to identify assumptions and values, examine different sides of an issue and possible actions, and make decision" (p. 246).

Accordingly, the social studies curriculum for the gifted and talented learners should include comprehensive themes and integrate concepts, reasoning, questioning, discoveries that reflect the perspectives of different disciplines, examining and comparing both old and new documents with the aim of finding causal relationships and using different forms of evidence during lessons. The social studies curriculum can be used to do research, critical thinking and reasoning. Distinctive programs can be created to enable the development of individual differences by analyzing primary sources, trying to make students ask high-level questions and use reasoning and research skills. The purpose of the differentiated instruction for gifted and talented learners is to support the development of their characteristic features and help them develop their potentials. Considering this, the curriculum should include more advanced subjects that actively are engaging and challenging that can fulfill the educational needs of gifted and talented students. Cause and effect relationships should also be used more frequently in the themes of the unit subjects (Van Tassel-Baska and Stambaugh, 2006). The integrated curriculum model can fulfill the educational needs of gifted and talented learners (Van Tassel-Baska, 1986). The model includes the use of higher order thinking skills. It is suitable for gifted and talented learners, and it was used as the framework for this study of developing a social studies curriculum unit of education for gifted and talented students in accordance with Integrated Curriculum Model.

Van Tassel-Baska's Integrated Curriculum Model (1986) was developed with the mental and affective characteristics that differentiate gifted and talented learners from their peers in mind, and its aim is to enhance these characteristics. The curriculum units

based on the integrated curriculum model were developed by researching individual differences and were specifically addressed to gifted and talented learners. This model is cited by many studies that used it to implement activities. It consists of three dimensions that are related to each other: the advanced content dimension, the process and product dimension and the epistemological concept dimension (Little et al., 2007). It differs from other models insofar as it bases course content on structured, real life problems and involves learners in a lifelong learning process that allows them to achieve learner autonomy. With the purpose of reaching a higher learning level, the content is associated with the main concepts, themes and acquisitions that are determined for a given grade of school. Many connections are built between the subject matters in the themes and various disciplines. The use of concept interpretation and concept development allows information to be learned as a system instead of separate pieces and for its use in daily life. This paper is based on an experimental study that determines the influence of the integrated curriculum model, which aims to improve the higher-level thinking skills of gifted and talented learners in the differentiated social studies course, on students' academic achievement, critical thinking and creativity.

Purpose of the research

The purpose of this study is to investigate the differences between treatment and comparison of gifted and talented students' academic achievement, creativity and critical thinking in a social studies curriculum unit developed based on the integrated curriculum model. The following research questions addressed as hypothesis of the research guided the study throughout statistical analyses:

- 1) Is there a difference between achievement scores (remembering, understanding, applying, analyzing, evaluating, creating) (Blooms revised taxonomy of learning objectives; Anderson and Krathwohl, 2001), and total achievement test scores of the experimental group that studied the differentiated Social studies curriculum unit and those of the control group that did not use the intervention?
- 2) Is there a statistically significant difference between the Critical Thinking scores (induction, deduction, recognizing assumptions, observation and all the dimensions of critical thinking) of the experimental and the control groups?
- 3) Is there a significant difference between the Creative Thinking scores (fluency, originality, flexibility, and creativity as a whole) of the experimental group and the control group?

“Fluency: the ability to produce many ideas in response to an open-ended problem or question. Flexibility: The ability to take different approaches to a problem thinker in different categories, or view a situation from several perspectives. Originality: Uniqueness, nonconformity” (Davis and Rimm, 1998, p. 186).

In the study, the integrated curriculum model was taken as framework; it is implemented used as a basis for the development of a distinctive social studies curriculum unit including the development of meta-cognitive and affective awareness. Since this model also includes the learning goals established by the Ministry of National Education (MONE) for the social studies curriculum and is also open to other learning goals, it has the flexibility that gifted and talented learners need in education. This study aims to initiate a discussion on developing new curricula suitable for gifted and talented learners and to advance new ideas regarding them.

METHOD

Population

Research population composed of 4th grade elementary gifted students (10 years old). Identification of gifted and talented students was conducted by Ministry of National Education branch named Counseling and Research Center by means of multiple scales. First, students were given a group test; they were qualified in terms of their test scores. Later they took individual IQ test. Finally they were arranged in terms of their scores; first 24 students were given right to register in school as gifted and talented students.

In the study, to determine the groups, the researchers used an Achievement Test (multiple choice and open-ended questions), the Cornell Critical Thinking Test and the Torrance Test of Creative Thinking (Torrance, 1974). The experimental and control groups were determined using the test scores and one-to-one correspondence. In both groups, necessary measurements were made before and after the experiment. In the experimental group, social studies course was taught using the course materials and program units that were differentiated by the researchers using the integrated curriculum model. The control group was taught by the classroom teacher with no intervention.

With this purpose, the *Luckily it is present* unit in the MONE fourth grade social studies curriculum was differentiated as described above while maintaining the current learning goals. After teaching the differentiated program unit, the differences between the academic achievements, critical thinking and creativity scores of the students in the experimental group were determined.

RESEARCH DESIGN

This study used pre-test and post-test control group and experimental design; it is a quantitative research method that investigated the effects of the Integrated Curriculum Model treatment in a social studies unit on gifted and talented students' academic achievement, creativity (creative thinking skills) and critical thinking skills.

The study used pre-test, post-test control group design (Table 1).

Table 1. Experimental design.

Groups	Pre-test	Experimental design	Post-test
Experiment group	Social studies achievement test 1	ICM Based Differentiated Social Studies Unit and Instruction	Social Studies Achievement Test 1
	Creative thinking test-verbal A1		Creative Thinking Test-Verbal B1
	Critical Thinking Test X 1		Critical Thinking Test X 1
Control group	Social Studies Achievement Test 1	Non-intervened instruction	Social Studies Achievement Test 1
	Creative Thinking Test-Verbal A1		Creative Thinking Test -Verbal B1
	Critical Thinking Test X 1		Critical Thinking Test X 1

Intervention procedures and Implementation

1. This study assessed some educational program models. These models describe educational precautions that should be taken regarding the characteristic features of the gifted and talented learners. Among these models, the integrated curriculum model was selected as a basis for the differentiation of the social studies curriculum. In accordance with the integrated curriculum model and considering Bloom's revised classification of educational goals that is each level of taxonomy: remembering, understanding, applying, analyzing, evaluating, creating (Anderson and Krathwohl, 2001), the unit was differentiated to enhance academic achievement, critical thinking and creativity.

2. The program unit was implemented in 12 lessons. The program was taught to the experimental group by the researcher. Briefings about the differentiation model were offered as leisure time activities.

3. The unit subjects were taught to the experimental and control groups at the same time.

4. Along with individual work, small and large groups were created according to students' interests, learners' profiles and talents in-class and out-of-class activities.

5. All the subjects in the *Luckily it is present* unit were studied in the framework of a general theme with interdisciplinary connections. The general theme was the concept of "change." It was stressed that connections with the theme would be discussed while studying the subjects. In the context of the differentiated unit, these connections were demonstrated in each of the activities by making tables of associations with other lessons.

6. For the differentiation process, certain techniques were selected for their suitability to the course content and learning objectives: problem based learning (PBL), brainstorming, concept mapping, thinking-pair-share, cubing numbers, small and large group discussions, *Six Thinking Hats* and cooperative learning.

7. The students were exposed to a wide range of thought on different levels to develop their meta-cognitive awareness. They were also given the opportunity to collect information and use conceptual frameworks.

8. In the lessons students were provided with worksheets, visuals reflecting scenes from real life, advanced level materials and activities that encouraged them to think. These practices allowed students to interpret information without memorizing it.

9. The differentiated program unit was studied in the framework of a

comprehensive theme embracing other disciplines. This concept-based integration analyzes the subject of the lesson from a conceptual perspective. The key concepts and principles of each discipline help students to make a diagram in their minds when they learn new information. As information makes more sense for students and their conceptual and factual perspectives are improved, they become more capable of seeing the order and connections between the concepts. Since "change" was used as the theme of the course content and structured real life problems were presented to the students, they were required to have better comprehension. It also becomes easier for them to pass from one discipline to another.

10. Another focus of the study were the dimensions of critical thinking skills, which are: induction, deduction, questioning assumptions and credibility, making observation and making generalization; students did activities about these dimensions and they were encouraged to build and discover connections between different disciplines. Another objective of the study was to encourage students to improve their higher-level thinking skills, that are: comprehending cause and effect relationships, making judgments regarding different criteria, recognizing the research problem, collecting evidences to support their ideas, determine their priorities, critical thinking, creativity and problem solving. Open-ended questions were asked with this purpose.

11. It should be noted that while experimental group was taught by the researchers, control group was taught by their own regular teachers. This situation can be considered as a limitation of the study. On the other hand, while considering this as one of the limitations of the study, it should also be mentioned that because of the nature of the research context, students from the 1st grade got used to be taught with different instructors from university for group studies.

Teaching the control group

There was no intervention in the control group during instruction of the unit. The social studies unit *luckily it is present* was instructed in accordance with Ministry of National Education curriculum for 4th graders for the unit. Mainly, textbooks were used to follow the unit; mainly lecture-based whole class teaching methods along with individual study methods engaged throughout the unit.

INSTRUMENTS

The research data was collected using the Social studies Achievement Test developed by the researcher. It includes multiple choice and open-ended questions. The Cornell Critical Thinking Test X was used to measure critical thinking skills, and the Torrance Test of Creative Thinking was used to measure creative thinking skills.

The Cornell critical thinking test X

The Cornell Critical Thinking Test X is a multifaceted test and is commonly used around the world. It was developed by Ennis and Millman (1985), and this study used this test to measure critical thinking skills (Ennis et al., 1985). The test has two versions, X and Z. It is a multiple choice assessment tool that has three choices for each item and includes 76 items. The Cornell Critical Thinking Test X has 4 dimensions: Using induction, deduction, assessing credibility, and identifying assumptions. Küçüktepe (2009) did the linguistic equivalence studies and validity and reliability analyses of the Cornell Critical Thinking Test X (Küçüktepe, 2009, pp. 202-204).

The Torrance test of creative thinking

The Torrance Test of Creative Thinking was developed by E. Paul Torrance to measure the creative thinking skills of the students in the experimental and control groups in framework of the differentiated program unit. The test has two forms: A and B. The A form of the test was given to students before the experiment, and the B form was given afterwards. Both forms of the Torrance Test of Creative Thinking include verbal and figural tasks. The test includes 10 tasks: 3 are figural, and 7 are verbal.

The test measures verbal and non-verbal creativity. Aslan (2001) made the linguistic equivalence study and reliability and validity analyses of the test for use in Turkish context. An instructor with a Torrance Test of Creative Thinking (Verbal Section) certificate was consulted to assess the test results.

The social studies academic achievement test

The researchers developed 2 achievement tests for the unit namely *luckily it is present* to measure experimental and control group students' academic achievement in social studies. These are the Multiple Choice Achievement Test and the Open-ended Question Achievement Test (6 questions). These tests were given to the students in both groups twice before and after the experiment to see the difference in their achievement. First, the draft achievement test were prepared and presented to experts for their opinions. Experts study both gifted education and social studies area of specializations. Research was revised in terms of experts' suggestions; afterwards the test was prepared for reliability and validity. The study of reliability and validity was conducted on 360 gifted and talented students. Then, item discrimination and item difficulty were calculated by means of item analysis. Values of item discrimination were found between .30 and .75. Average difficulty of the test was calculated as 0.45 to determine consistency of achievement test; Cronbach Alpha reliability was also calculated. Value of KR20 was calculated as 0.76. Multiple choice achievement test was given the final shape in terms of these calculations, composing of 50 questions. Open-ended Question Achievement Test consisted of 6 questions in terms of field experts' guidance. Open-ended question part of achievement test was evaluated in

terms of self-contained rubric for each question that was produced by the researchers under supervision of the field experts.

Limitations of the study

It should be noted that education, programs and services gifted and talented education is rather limited in Turkey. The research context of this study is a unique state school that gives opportunity to enter this elementary school, quite limited number of identified gifted and talented students by the Center of Guidance and Research Center as a branch of Ministry of National Education. The school served gifted and talented children in accordance with cooperation protocol with Istanbul University. The school conducts a model that accepts 24 gifted and talented students based on their average points from multiple evaluation criteria then listed to have right to register from the student getting highest average assessment point. As a consequence of limited number of identified gifted and talented students in the research context, sample is small (Control Group N= 10, Experimental Group N= 11). As mentioned earlier, the school setting is a unique state school that serves gifted and talented students; this creates uniqueness and limitation of this study. Due to the small sample size, this study, even though a quantitative research, cannot be generalized. This is another important limitation of the study. Other limitation of the study is the curriculum unit. Researchers developed a unit for 4th grade students in terms of Integrated Curriculum Model and designed an instruction in accordance with the unit. We hope in further studies, to reach larger sample of identified gifted and talented students and design multiple units from diverse grade levels.

Data analysis

The data were analyzed using suitable statistical techniques, and the findings were tabulated and explained. The data acquired by comparing pre-test and post-test results were assessed in an electronic environment using statistical programs.

Since the number of students in both experimental and control groups was less than 30, the researchers used non-parametric Mann Whitney U analyses. For in-group comparison of the experimental and control groups' pre-test and post-test results, the researchers used non-parametric Wilcoxon-Z analysis. The data were analyzed using a $p < 0.05$ significance level.

FINDINGS

This study examines the differences between the academic achievements, critical thinking and creativity scores of the experimental group who studied a social studies curriculum that was differentiated based on the integrated curriculum model and the control group who received non-intervened instruction. The findings are given in the same order with the hypotheses:

Social studies achievement test scores (Pre and post) between the experiment and control group

As Table 2 shows, the mean score of the control group

Table 2. Descriptive values of total academic success score of groups.

Test	Group	N	X	Ss
Pre-Test	Control G.	10	72.00	13.800
	Experiment G.	11	83.82	31.301
Post-Test	Control G.	10	104.00	20.456
	Experiment G.	11	227.00	41.093

Table 3. Mann-Whitney U test result of groups according to total social studies achievement test score.

Total achievement	N	S.O.	S.T.	U	Z	P
Control	10	5,50	55,00			
Experiment	11	16,00	176,00	0.000	-3,874	0,000*
Total	21					

* $p < .001$.

on the achievement test pre-test is 72.00, and their mean score on the post-test is 104.00. The mean score of the experimental group on the achievement test pre-test was 83.82, and their mean score on the post test was 227.00. As Table 3 shows, the non-parametric Mann Whitney U test that was addressed to determine the difference between the mean scores of the groups on the achievement test indicated the statistically significant difference was in favor of the experimental group ($U=0.000$, $z=-3.874$, $p<0.01$).

This finding clearly indicates that the differentiated social studies curriculum unit increased the achievement of the students in the experimental group.

Critical thinking test scores between the experiment and control groups

As Table 4 shows, there is a significant difference between the groups in favor of the experimental group ($U=21.000$, $z= -2.419$, $p < 0.05$). Regarding the induction scores, these findings indicate that the differentiated social studies curriculum unit studied by the experimental group was more effective than the non-intervened instruction given to the control group.

As Table 4 shows, there is a significant difference between the groups in favor of the experimental group ($U=22.000$, $z=-2.341$, $p < 0.05$). Regarding the deduction scores, these findings indicate that the differentiated social studies curriculum unit studied by the experimental group was more effective than the non-intervened instruction given to the control group.

As can be seen in observation scores (Table 4) there is a significant difference between the groups in favor of the experimental group ($U=13.500$, $z=-2.955$, $p < 0.01$), these findings indicate that the differentiated social studies curriculum unit studied by the experimental group was more effective than the non-intervened instruction given to the control group regarding observation scores.

It can be seen also there is a significant difference between the groups in favor of the experimental group ($U=19.000$, $z=-2.571$, $p < 0.05$). Regarding the assumption scores, these findings indicate that the differentiated social studies curriculum unit studied by the experimental group was more effective than the non-intervened instruction given to the control group.

Regarding the Total Critical Thinking scores of groups, there is a significant difference between the groups in favor of the experimental group ($U=0.500$, $z=-3.840$, $p < 0.01$)., these findings indicate that the differentiated social studies curriculum unit studied by the experimental group was more effective than the non-intervened instruction given to the control group. This finding clearly indicates that the differentiated social studies curriculum unit increased the critical thinking scores of the students in the experimental group.

Creative thinking (creativity) scores between the experiment and control groups

The descriptive statistics for the creative thinking scores are shown in Table 5.

As can be seen in Table 6, there is no statistically significant difference between the total fluency scores of the two groups ($U= 34.000$, $z= -1.479$, $p > 0.05$). On the other hand, the fluency mean score change is higher in experimental group. The pre-test fluency mean score of the control group is 63.80, and their post-test mean score is 62.30. The pre-test fluency mean score of the experimental group is 69.09 and the post-test mean score is 81.27.

As can be seen in Table 6, there is no statistically significant difference between the total originality scores of the two groups ($U= 53.000$, $z= -0.141$, $p > 0.05$). Groups' mean scores are as follows: The pre-test Originality mean score of the control group is 53.82, and their post-test mean score is 48.64. The pre-test Originality mean score of the experimental group is 47.30 and the post-test mean score is 45.60.

There is a statistically significant difference between the total flexibility scores of the two groups in favor of the experimental group ($U=9.500$, $z= -3.208$, $p < 0.01$). Groups' mean scores are as follows: The pre-test Flexibility mean score of the control group is 32.00, and their post-test mean score is 34.10. The pre-test Flexibility mean score of the experimental group is 32.82 and the

Table 4. Mann-Whitney U test result of groups according to total critical thinking test scores.

Critical thinking total score		S.O.	S.T.	U	Z	P
Control	10	7.60	76.00			
Induction experiment	11	14.09	155.00	21.000	-2.419	0.019*
Total	21					
Control	10	7.70	77.00	22.000	-2.341	0.019*
Deduction Experiment	11	14.00	154.00			
Total	21					
Control	10	6.85	68.50	13.500	-2.955	0.003*
Observation experiment	11	14.77	162.50			
Total	21					
Control	10	7.40	74.00	19.000	-2.571	0.010*
Assumption experiment	11	14.27	157.00			
Total	21					
Control	10	5.55	55.50	0.500	-3.840	0.000**
Total experiment	11	15.95	175.50			
Total	21					

* $p < 0.05$; ** $p < 0.01$.

post-test mean score is 61.36.

There is no statistically significant difference between the total Creative Thinking scores of the two groups ($U = 30.000$, $z = -1.760$, $p > 0.05$). There is no significant difference between the total Creative Thinking scores. But the total Creative Thinking mean score change is higher in experimental group than in control groups. Groups' mean scores are as follows: The pre-test total Creative Thinking mean score of the control group is 142.60, and their post-test mean score is 142.00. The pre-test total Creative Thinking mean score of the experimental group is 155.73 and the post-test mean score is 191.27.

Based on the data acquired by this experiment, it can be said that the differentiated social studies curriculum unit in this study was more effective than control group instruction at increasing the academic achievement, critical thinking skills and creativity of gifted and talented students.

DISCUSSION AND CONCLUSION

The study shows that in the social studies content area while the curriculum integrates higher-level thinking, problem solving activities, may be beneficial for gifted

and talented learners' knowledge-based gains, and also higher order thinking specified in this study as creative and critical thinking. Another significant finding of the study demonstrates that, while the curriculum and instruction is designed in accordance with gifted and talented educational needs and characteristics, this may provide gains for students' potentials as also Little et al. (2007) indicated.

It is critical that educational measure be taken for gifted and talented learners who need special education and that the objectives of their education are determined correctly. Correctly determined objectives help us to focus, direct our efforts, motivate us and help us to visualize what we want to achieve. Since instruction is a purposeful and deeply thought out process, these objectives have special importance. Benjamin Bloom's classification of educational objectives is commonly accepted by professionals. It is used to determine curriculum standards in studies of curriculum differentiation. Bloom divides the cognitive domain into six categories: remembering, understanding, applying, analyzing, evaluating and creating. These phases are arranged in order from the simplest to the most complicated (Anderson and Krathwohl, 2001). Beyer (1987) regards these components of the cognitive educational objectives as micro-thinking skills or building

Table 5. Descriptive values of total creative thinking scores of groups.

Creativity-verbal	Group	N	X	Ss	
Fluency	Pre-Test	Control	10	63.80	11.013
		Experiment	11	69.09	24.292
	Post-Test	Control	10	62.30	11.275
		Experiment	11	81.27	34.442
Originality	Pre-Test	Control	10	47.30	8.070
		Experiment	11	53.82	21.766
	Post-Test	Control	10	45.60	12.563
		Experiment	11	48.64	12.476
Flexibility	Pre-Test	Control	10	32.00	6.749
		Experiment	11	32.82	6.661
	Post-Test	Control	10	34.10	6.523
		Experiment	11	61.36	27.969
Total	Pre-Test	Control	10	142.60	24.811
		Experiment	11	155.73	51.831
	Post-Test	Control	10	142.00	24.317
		Experiment	11	191.27	71.431

Table 6. Mann-Whitney U test result of groups according to total creative thinking test score.

Creativity-verbal	N	S.O.	S.T.	U	Z	P	
Fluency	Control	10	8.90	89.00	34.000	-1.479	0.139
	Experimental	11	12.91	142.00			
Total		21					
		10	10.80	108.00	53.000	-0.141	0.888
		11	11.18	123.00			
Flexibility	Control	10	6.45	64.50	9.500	-3.208	0.001*
	Experimental	11	15.14	166.50			
Total		21					
	Control	10	8.50	85.00	30.000	-1.760	0.078
	Experimental	11	13.27	146.00			
Total		21					

*p< 0.05.

blocks for more sophisticated operations such as conceptualization, problem solving and decision-making (Maker and Schiever, 2005). While developing the differentiated social studies curriculum unit, care was taken to ensure that information was not given out of context. Content is the first dimension of the integrated curriculum model. It includes teaching content by making interdisciplinary connections. Content-oriented (themes, problems or concepts) interdisciplinary study requires better comprehension skills. In the differentiated curriculum unit, the remembering category was given together with the content, and the content was grounded in comprehensive discussion topics, themes and concepts instead of different, isolated subjects (VanTassel-Baska and Wood, 2009). The purpose was to give both general and field-specific information. Based on this opinion, all information was arranged according to the concept of "Change," and a basis was created to enable students internalize the information given to them. Since the population consisted of gifted and talented learners, it was assumed that they had more than one interest, and they were encouraged to have comprehensive learning experiences in the subjects that interested them rather than simply making additions to the conventional curriculum. In the differentiated program unit, gifted and talented students were encouraged to learn the basic information faster. Thus, the program was designed with their learning pace in mind. Along with MONE's (2005) social studies curriculum, the unit was enriched with more information and advanced subjects (e.g., radiation, SAR values) to fulfill the needs, characteristics and interests of gifted and talented learners. Thus, a more active classroom environment was created with the support of field experts and with advanced materials they recommended.

Problem based learning was also used to develop the program unit since it is a systematic and controlled method (Ciftci et al., 2007). Since the subjects are based on structured, real life problems, the information is meaningful, and the students are encouraged to internalize it. The purpose here is to increase its memorability and information transfer to higher levels. Gregory and Chapman (2002), Altun (2004), Ciftci et al. (2007) and Devci (2002) used problem based learning (PBL) in their studies, and their findings were similar with this study. They determined that this approach had positive results, and influenced the significance of the results obtained by the experimental group ($p < 0.01$).

In the differentiation process, both critical and creative thinking were applied to assess solutions. A full comprehension of the structured, real life problems is very important to make a correct assessment of their attempted solutions. Necessary and unnecessary information should be identified to lead to solutions, and some should be eliminated. The correctness of the

operation should be checked at the end of each phase. To reach the best solution, it is necessary to create hypotheses continuously and discuss their positive and negative aspects. Assessment and creation phases were used consecutively and continuously while searching for solutions to problems. The students were given continuous feedback. They were encouraged to participate actively in the lessons and to brainstorm to find the best solution after evaluating the alternatives. The technique from *Six Thinking Hats* was used to promote thinking and to improve creative thinking skills. Students produced very different thoughts when they were asked to think aimlessly on their own and when they produced thoughts using this technique. Being able to ascribe thoughts to the hats helped them to express the thoughts they did not want to share as their own, and their thoughts became much more open-ended.

In the second dimension of the integrated curriculum model, the instruction of higher-level thinking skills is more dominant, and the students are expected to generate creative products. While studying with gifted and talented students, they were given the opportunity to create original products regarding their characteristic features and supporting their different perspectives. Their creativity was supported along with their critical thinking and problem solving skills. The criteria were discussed one by one in the activities, and the students were encouraged to use them in the activities with the aim of improving their creativity. A systematic and organized approach is required for students to learn higher-level thinking skills. The phases that aim to improve the efficiency of the curriculum use higher-level thinking skills, which start with the solution. The research findings suggest that the differentiated curriculum is more effective in the phases of higher-level thinking. In this dimension, learning activities were specifically addressed to develop the skills of problem solving, divergent thought and research skills apart from personal interests. Divergent thinking is the process of producing new and creative ideas. When we stop using normal ways of thinking and try to find more than one correct answer, we are applying divergent thinking (Cash, 2011). Divergent thinking seeks alternative solutions to structured, real life problems. In the implementation of creative thinking techniques, the researchers gave students the opportunity to think of different ideas and alternatives instead of insisting on working with established ideas.

Knowing and using alternative research techniques is more important in social studies instruction than any other discipline since students' achievement depends on their critical thinking skills and the mental developments that enable them to learn research skills. Beyer (2001) stresses the need to combine problem solving, argument strategies, critical thinking skills, information processing and reasoning skills in social studies.

This study aimed to ask questions that developed critical thinking skills that fulfilled this necessity. It also aimed to create heated debates during these lessons with gifted and talented learners. The students were encouraged to reason in certain situations rather than emphasizing the situation itself.

If teachers promote critical thinking in their lessons, their students' cognitive development will be enhanced. The regular use of critical thinking skills in lessons will increase students' participation in the critical thinking process, and this will create a highly participatory classroom environment for all students. These needs should be considered in a well-organized social studies lesson. The hypotheses of the study are supported by the outcomes of the research since the critical thinking scores of the students in the experimental group depend on higher-level thinking skills. It is remarkable that higher-level thinking skills are taught in the context of disciplines to gifted and talented students along with an enhancement lesson on their characteristic features and cognitive development. Of the higher-level thinking skills, critical thinking, problem solving and research skills should be the building blocks of the education of gifted and talented learners (Van Tassel-Baska and Brown, 2006).

An open-ended achievement test was created for use in this study, and it aimed to assess the fluency, flexibility and originality sub-dimensions of creativity. The content and process of differentiated social studies instruction was enriched by activities that were addressed to develop these dimensions of creativity. Along with social studies content, the activities included explanations of the criteria for the dimensions and the use of the criteria in studies, and the importance of creativity was illustrated by a variety of examples. The researchers made use of a variety of techniques that improve creative thinking, e.g., analogical and metaphorical thinking, PBL, brainstorming and *Six Thinking Hats* (Davis, 2006).

Problem solving and creative production are two of the most complicated intellectual activities. They are based on both creative and critical thinking processes (Russo, 2004). These two types of learning are like one within the other due to their similarities. Problem solving is a creative process and creative production is a tool for solving problems (Guilford, 1985). A cognitive approach to creativity aims to comprehend the processes behind mental representations and creative thinking (Sternberg and Lubart, 1999).

For the creative thinking activities in the differentiated social studies curriculum, the criterion of authenticity was specifically considered. It should be noted that no significant differences in authenticity scores between the groups were noted since the students in both groups attend creativity lessons beginning in first grade. Authentic thinking is defined as synthesizing or associating previously known thoughts with unconnected,

original and new ideas. Authentic thinking requires more high-level cognitive talent than the other creative thinking skills. It requires fluency and flexibility. Thus, it is estimated that a group of students who are already receiving this training need a longer period of study to develop these skills to the extent that they become significantly different from the other group.

The content of the social studies usually draws the attention of gifted and talented learners. Relevant studies in the literature agree that a longer period of study is required to develop the original thinking skills of students in the control group to enable them make a significant difference (Sternberg and Lubart, 1999). A multidimensional operation is required for such a process. Here is an example of this process: a student produces an original idea, gives it form and presents this idea. These skills can be developed by differentiated instruction; however, it will take a very long time to achieve this. Therefore, the differentiated curriculum unit should be implemented in primary schools for longer periods to make a better assessment of its effectiveness in the authenticity aspect of creative thinking. In this age of change, it is important to popularize this kind of differentiated education

To conclude, information is in a state of constant change, and access to information is quite easy in this age of information. This situation has changed perspectives on getting information. Adaptation to change and problem solving skills have become important in the modern age. Adaptation to change requires creativity. The requirements of our age make it necessary to renovate educational programs and systems. It is critical that educational measures be made for gifted and talented learners who have different perspectives and creative thinking skills since they will contribute to the development of our country. Creativity makes it possible for us to adapt to an unknown future successfully. Thus, it should not be disregarded that we need effective, differentiated programs that fulfill these needs, promote the use of higher-level thinking skills and use rich materials, activities and methods with the students' interests in mind.

Future research studies should take into consideration some limitations of this study such as sample size of the study, number of differentiated units in research area. Future research studies may extend sample size and number of units in terms of availability.

Gifted and talented students complete their personal development by interacting with themselves and others. They also make use of their thinking skills and thinking processes, which enables them to accelerate their cognitive and affective development. Although the relevant literature stresses out the necessity of research studies, little research been done in this field. It is hoped that the differentiated social studies curriculum model in

this study will guide and serve as a framework for future research studies on the education of gifted and talented students.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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