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Effect of Conceptual Change Texts for Overcoming Misconceptions in "People and Management" Unit *

Orhan DAĞDELEN **
University of Amasya, Turkey

İlker KÖSTERELİOĞLU
University of Amasya, Turkey

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Abstract

This study aimed to investigate the effects of conceptual change texts in teaching concepts in the "People and Management" Unit of a Social Studies Course. The working group of the study was composed of 4th graders in a primary school in Çorum, assigned as control (*n*= 23) and experimental (*n*= 23) groups. Non-equivalent control group design, a quasi-experimental method, was used in the study. Conceptual change texts were used in the experimental group for 4 weeks to overcome misconceptions related to "constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration" and traditional teaching approach was used in the control group. The People and Management Unit Achievement Test (PMUAT) was utilized in the study as data collection tool. Analysis of experimental and control groups' pre and post test scores pointed to significant differences in the favour of experimental group in the post test.

Keywords: Concept, Misconception, Conceptual change texts, Social studies course.

Introduction

Concepts are crucial in making sense of the world and comprise an important part of learning. If it were not possible to group objects, events and ideas based on common aspects, it would be obligatory to learn each element separately (Çeliköz, 1998). Starting at birth, people develop concepts as a result of their interactions with their environments on the one hand while learning the vocabulary related to those concepts on the other. As a result of mental connections formed among them, these learning experiments transform into new learning opportunities and make sense. This is a lifelong process that allows the

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** Orhan Dağdelen, Institute of Social Sciences, Amasya University, Amasya, Turkey. Phone: +90 358 2526230-3351, E-Mail: orhandagdel05@hotmail.com

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generation of new knowledge and interpretation of existing knowledge in new ways (Yıldırım, 2010).

Concept is a term that is used to classify objects, events and processes which are similar (Cannon, 2002). Concepts that are the building blocks of knowledge and units of thought are learned by children starting from early periods in their lives. Children later classify them, form relationships among them and make sense of new information (Koray & Bal, 2002). Concepts make contributions for us to figure out the objects found in our environment and world by reducing the complexity of the environment we live in. Furthermore, they simplify the communication among people and provide the organization of knowledge in a systematic way (Driver & Erickson, 1983). Concept learning starts at birth and becomes more complicated throughout their lives. In general, children learn concepts as a result of random experimentation. Planned concept teaching starts with schooling (Ülgen, 2001).

Social Studies Courses are one of the classes in which students come across many concepts. Primary school students need to comprehend basic concepts very well in order to learn principles of the Social Studies discipline and solve the social problems they will be given. One of the goals of Social Studies primary education courses is to ensure student comprehension related to various concepts presented in units (Yazıcı & Samancı, 2003).

Social Studies classes aim to provide students with the basic knowledge, skills, attitudes and values related to social life based on selected information from social sciences disciplines in order to educate decent and responsible citizens (Öztürk & Otluoğlu, 2002). That is, Social Studies exist to understand people and their lives in all aspects. Trying to memorize a pile of information in order to understand human beings and their lives will be insufficient and meaningless. Therefore, attention should be paid to learn concepts accurately in order to make sense of the information learned in the process.

The Social Studies program has a broad and detailed content which points to substantiality of the concepts and hence concepts in all units should be taught and learned accurately and meaningfully. Learning of a unit or a subject is based on meaningful and permanent concept learning. Teaching concept is a task which is making the related concept to be understood in the individual's mind (Morgan, 1977). Doğanay (2005) states that concept teaching in Social Studies courses contribute to learning, facilitating memory and communication as well as increasing academic achievement.

Accurate concept learning is related to meaningful learning. Meaningful learning ensures accurate understanding of concepts and prevents misconceptions. While teaching concepts related to Social Studies, teachers should ensure accurate learning by paying attention to prior student knowledge. New information is built on existing information and assimilated by students. Teachers can ensure that by planning their lessons, using effective methods and techniques and structuring information that the students receive. Başaran (1994, p.13) draws attention to instructional planning by stating that "planned instruction is not composed of learning environments with random objects, events or thoughts".

It is only through well prepared programs that meaningful learning can be ensured. With this aim in mind and parallel to the social, cultural, economic and technological developments of the world, the Ministry of National Education introduced teaching programs in 2005 based on a constructive approach as a fundamental paradigm in the place of teaching programs that focused on behavioural approaches. The transformation experienced in all of the teaching programs is also reflected in Social Studies classes (Demir & Akengin, 2014).

According to constructivism, the basis of teaching programs in Turkey, students do not take the presented information as it is. They first compare the presented information with their prior knowledge, analyse it and structure it idiosyncratically. A constructivist approach increases achievement in education since it leads students to think, associate existing knowledge with different information and interpret the outcome (Saygın, 2003). In this process, teacher should give the students the chance to make a variety of activities and obtain the results. Moreover, tutor should guide the students to structure the new information in a meaningful way (Martin, 1997).

It is important to use methods and techniques that are based on conceptual change approach and constructivist approach which prevents the students from learning the concepts wrongly or incompletely for a meaningful learning (Aydın & Balım, 2013). One of the practices that make students active and target knowledge structuring is the conceptual change approach. Learning which means the happening of conceptual change becomes successful through achieving new data and revising the available information (Dykstra, Boyle & Monarch, 1992; Eckstein & Shemesh, 1993; Linder, 1993; Riche, 2000). Conceptual change approach represents and alternative approach that allows a passage away from misconceptions, i.e. unscientific information, to scientific knowledge. This approach is based on Piaget's principles of assimilation, accommodation and equilibrium (Wang & Andre, 1991). What is tried to mention with this is that conceptual misunderstanding must be expressed in detail for the activities that will be developed to remove conceptual misunderstandings or make real the conceptual change to be successful according to Case & Fraser (1999). It is necessary to review existing knowledge and change it in a manner that accommodates new knowledge in order to overcome misconceptions and ensure meaningful learning (Canpolat & Pınarbaşı, 2002). Conceptual misunderstandings make it difficult for obtaining new concepts and students act involuntarily to abandon old or wrong mistakes which are close to the concept to be learned (Terry, Jones & Hurford, 1985; Hewson and Hewson, 1991). One of the most effective methods to overcome student misconceptions is the use of conceptual change texts. Conceptual change texts, proposed by Roth (1985), are texts that allow students to become aware of misconceptions by presenting contradictions between scientifically accepted information and student misconceptions (Hynd & Alverman, 1986; Toka & Aşkar, 2002).

The purpose of using conceptual change texts is to explain misunderstandings (alternative ideas) and to activate them by disproving examples of misconceptions (Çakır, Geban & Yürük, 2002). Conceptual change texts start with a question and students are made aware that they lack information about the concepts in question. The dissatisfaction generated with this task creates the ground to exchange new knowledge with the inaccurate one. Accurate and inaccurate examples for the concepts are provided to reinforce learning. Therefore, alternative concepts (misconceptions) are replaced with accurate concepts. Using the previously learned experiences of students to show them that their current knowledge is insufficient and to maintain a purposeful learning is stated to be an effective application in teaching concepts (Shiland, 1999).

Although many studies exist in literature in which conceptual change texts are used, most of the studies are related to the field of Science (Altuntaş Aydın, 2011; Çaycı, 2007; Dilber, 2006; Özdemir & Dindar, 2013; Yüksel Gülçiçek, 2004). There are some studies in Social Sciences Field which utilize conceptual change texts; however, they are generally limited to teacher candidates at high school or graduate school level (Akbaş, 2008; Birinci & Konur, 2010; Kılıçoğlu, 2011; Türksever, 2013). This literature review suggests that studies on the effects of conceptual change texts at primary school level do not exist. Even though the conceptual change texts are not used, there are studies in which different

methods are used in teaching of the concepts and in which the conceptual delusions in the extent of Social Sciences lessons are revealed. In one of these studies (Jahoda, 1963), which aimed at determining how much the concepts of county and nation are developed in the minds of the students aged at 6 to 11, the students are requested to express the relation between the settlements from near to far (Glasgow, Scotland & Britain). The conclusion that the students' views about these concepts differ according to their ages was drawn out from the study. Sheridan (1968), in a study to determine the knowledge and views of 6 year old students who are the beginners of primary school about the conceptions about physical geography, concluded that their knowledge about these concepts is either insufficient or wrong. Harwood and Jackson (1993) did a study to determine the comprehension levels of a small group aged 9 to 11 about concepts related to physical environment. The comprehension levels of the students chosen from 9-11 year-olds about nine concepts that are used in the everyday language and related to physical environment (coast, sea, harbour, river, mountain, hill, ocean, cliff and valley) are observed in the study. At the end of the study, the students are found to have many misunderstandings about these concepts. After another study done by Milburn (1972), it was found that many geographical concepts (latitude, valley, basin, summit, North pole, pole, etc.) weren't understood enough by students. Moreover, there are studies carried out in the process of "People and Management" unit in which this study is carried out. For instance; Bal and Akış (2010), studied misconceptions and their causes in 4th grade Social Studies unit "People and Management". The study results presented indicate that students had misconceptions regarding national sovereignty, citizenship, independence a public opinion concept studied at class. Topcubası and Polat (2014) examined the effect of using concept cartoons in "People and Management" on student achievement. Results showed that the use of concept cartoons increased student achievement. Ocak and Küçükilhan (2014) investigated the effect of using Student Teams-Achievement Divisions Based on Cooperative Learning technique in 4th grade "People and Management" unit on academic achievement and permanence of learning. Results pointed to the success of the technique.

In addition to these studies, Doğan (2007) sought to determine student achievement levels and misconceptions -if any- related to "government/state, national sovereignty, republic, democracy, constitution, legislation, centralized administration, local administration and citizen" concepts in primary school 5th grade unit "One Nation, One Flag". Student achievement on each concept was investigated and rating of concepts from most successful to least successful was found to be: "citizen, national sovereignty, democracy, local administration, republic, government/state, constitution, central administration, legislation".

Instead of using the whole unit for study, the study in question tested the effect of conceptual change texts on specific concepts about which students have misconceptions (constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration) determined by Concept Identification Form (CIF)

Significance of the study

It important for information obtained in Social Studies classes to be scientifically sound since it will affect future learning in the field. Students bring prior information to school. Concepts that are planned be taught are not given at the desired level due to misconceptions in these prior knowledge students bring to school. Also, the methods, language, materials, and textbooks utilized in the classroom and the teachers themselves may cause misconceptions. Since concept learning is related to the connections among concepts, misconceptions may negatively affect future learning. Therefore, it is crucial to identify and overcome student misconceptions.

It is imperative to utilize methods that ensure active student participation to prevent the formation of misconceptions. The study in question utilized conceptual change texts, one of the conceptual change approaches, in order to increase student achievement in concept learning. It has been identified that studies in Turkey that focus on the use of conceptual change approach and the effects of conceptual change texts on student achievement in Social Studies are mostly limited to secondary school, high school and university levels and that studies regarding primary schools are rather few. Also, studies on the effects of using conceptual change texts are generally in the field of Science. In short, study results and suggestions are expected to improve effectiveness and productivity of Social Studies teaching and to ensure more effective concept teaching by overcoming misconceptions at an earlier point in time.

Problem statement

Problem statement of the current study is: What is the level of impact in overcoming student misconceptions as a result of teaching with conceptual change texts in primary school 4th grade Social Studies courses?

Answers to sub problems provided below were sought in this direction:

1. Are there significant differences between the pre-test scores of classrooms which utilized conceptual change texts and those which used traditional teaching methods?
2. Are there significant differences between the post test scores of classrooms which utilized conceptual change texts and those which used traditional teaching methods?
3. Are there significant differences between the pre and post-test scores of the classroom which utilized traditional teaching methods?
4. Are there significant differences between the pre and post-test scores of the classroom which utilized conceptual change texts?
5. Are there significant differences between the control and experimental groups' pre and post-test achievement scores?
6. What are the pre and post-test achievement levels of the concepts taught in control and experimental groups?

Method

Research model

The current study that examined the effect of using conceptual change texts on overcoming misconceptions related to "constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration" concepts utilized a "non-equivalent control group design quasi-experimental method". In this method, special effort is not given to have equivalent subjects as a result of random assignments but attention is paid to ensure subjects have similar qualities as much as possible. Also, control and experimental groups are randomly assigned in this design (Karasar, 1999).

Working group

Working group of the study was composed of a total of 46 students attending two different 4th grade classes a primary school in Çorum. Implementation was undertaken in the spring term of 2014-2015 academic year. One of the classes was assigned as the experimental group in which conceptual change texts were utilized (n= 23) while the

other was assigned as the control group which used traditional teaching (*n*= 23). The People and Management Unit Achievement Test (PMAT) was given to eight 4th grade classrooms as pre-test. Two classrooms whose achievement levels were found to be similar according to the pre-test were selected for the study. These classrooms were assigned as experimental and control groups randomly by casting lots.

Implementation process

Following the formation of experimental control groups, Conceptual Change Texts (CCT) which were prepared by the researchers were given to the experimental group teacher and the practice was observed. While the classes were taught in the experimental group with the help of conceptual change texts developed by the researchers, classes in the control group was taught by using the activities included in the Social Studies teaching program. The unit was completed in a 4-week implementation period.

Data collection tools

People and Management Achievement test (PMAT). Prior to test preparation, Concept Identification Form (CIF) was generated by using the concepts in the selected unit. This form was given to 40 classroom teachers that previously taught in 4th grades and they were asked to put a check the concepts which students generally find hard to learn and have misconceptions about. As a result of this process, 9 concepts (constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration) were identified and the achievement test was designed in this direction. A multiple choice achievement test of 27 items (3 items for each concept) was prepared to test the effectiveness of conceptual change texts. 4 experts in the field of measurement and evaluation were consulted during the preparation of the measurement tool and necessary arrangements were made on the test based on the feedback received from the experts. Three experts and two Social Studies teachers were consulted for content and face validity of the test and the test was finalized.

The test was first implemented to a total of 180 students (4th (*n*= 60), 5th (*n*= 60) and 6th (*n*= 60) graders). The People and Management Achievement Test (PMAT), composed of 18 questions, was finalized by taking item difficulty and discrimination levels into consideration. According to data from which were taken the first implementation, Cronbach's Alpha (*a*) reliability coefficient of the test was 0.71 average discrimination of the test was 0.43 and average difficulty was 0.41.

Conceptual Change Texts (CCT). While preparing the conceptual change texts, articles and theses that used this teaching material were examined. Theoretical information was obtained about the necessary steps in preparing and using CCTs. Also a literature review was conducted on "constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration" concepts. This review focused on misconceptions emphasized in theses, textbooks and articles and notes were taken to use in the preparation of conceptual change texts. Prepared texts were examined by two researchers who previously studied the topic. An expert in the field of Social Studies and two Social Studies teachers were consulted about the prepared CCT. Texts generated following the feedback were given to 8 4th graders to check for intelligibility. Necessary arrangements were made and CCT was finalized.

Data analysis

Quantitative data collected during the study were digitally transferred to SPSS 18.0 package program. While dependent samples t-test was used in analysing experimental and control groups' pre and post test scores, independent samples *t*-test was used for comparisons between experimental and control groups. Normality distribution pointed to

normal distribution of scores even though experimental and control groups consisted of 23 students each. Dependent samples *t*-test which compared achievement scores of experimental and control groups showed normal distribution in differences.

Findings

This section presents the results obtained from experimental and control groups.

Findings regarding the first sub problem

Table 1 presents the statistical values of experimental and control groups' pre-test scores related to the first sub problem.

Table 1. *Independent samples t-test results related to the comparison of experimental and control group pre-test scores*

Group	*N*	Mean	*sd*	*df*	*t*	*p*
Experimental	23	10.00	2.59	44	-0.272	.787
Control	23	10.22	2.83			

Table 1 presents pre-test scores of experimental and control group students. While the mean for the experimental group M_{exp}= 10.00, the mean for control group was found to be $M_{control}$= 10.22. Pre-test scores do not show meaningful differences between experimental and control group students ($t_{(44)}$= -0.272; p> 0.05). This finding may point to the fact that both groups had equivalent levels of prior information before the experiment.

Findings Regarding the Second Sub Problem

Table 2 presents the statistical values of experimental and control groups' post test scores related to the second sub problem.

Table 2. *Independent samples t-test results related to the comparison of experimental and control group post test scores*

Group	*N*	Mean	*sd*	*df*	*t*	*p*
Experimental	23	14.35	2.84	44	3.787	.000
Control	23	11.65	1.90			

Table 2 presents post-test scores of experimental and control group students. While the mean for the experimental group M_{exp}= 14.35, the mean for control group was found to be $M_{control}$= 11.65. Post-test scores show significant differences between experimental and control group students ($t_{(44)=}$ 3.787; p< 0.05). This finding points to significant differences between experimental and control groups' post test scores in favour of the experimental group. According to this result, student achievement in the group taught with the help of concept change approach generated significant difference compared to the group taught with traditional approach. In the post-test scores, the calculated size effect of meaningful difference in favour of experimental group is high level (η^2= 24.5).

Findings regarding the third sub problem

Achievement scores for control group students obtained from PMAT pre and post tests were compared with the help of t-test. Table 3 presents the obtained data.

Table 3. *Dependent samples t-test results related to the comparison of control group PMAT pre and post-test achievement scores*

Control Group	*N*	Mean	Mean Difference	*sd*	*df*	*t*	*p*
Post Test	23	11.65	1.43	1.90	22	-2.208	.038
Pre Test		10.22		2.83			

Table 3 presents control group students' mean pre-test scores as $M_{control}$= 10.22 and mean post test scores as $M_{control}$= 11.65. Difference between post and pre-test mean scores was found to be 1.43. This result points to meaningful increase for the control group students as a result of teaching via traditional methods ($t(22)$= -2.208; p< 0.05). In the post-test scores, the size effect of meaningful difference in favour of control group is middle level (η^2= 9.98).

Findings regarding the fourth sub problem

Achievement scores for experimental group students obtained from concept achievement test pre and post tests were compared with the help of t-test. Table 4 presents the obtained data.

Table 4. *Dependent samples t-test results related to the comparison of experimental group PMAT pre and post-test achievement scores*

Experimental Group	*N*	Mean	Mean Difference	*sd*	*df*	*t*	*p*
Post Test	23	14.35	4.35	2.84	22	-5.036	.000
Pre Test		10.00		2.59			

Table 4 presents experimental group students' mean pre-test scores as M_{exp}= 10.00 and mean post test scores as M_{exp}= 14.35. Difference between post and pre-test mean scores was found to be 4.35. This result points to meaningful increase for the control group students as a result of teaching via traditional methods ($t(22)$= -5.036; p< 0.05). This finding points to significant increase in achievement for experimental group students as a result of teaching with the help of conceptual change texts. In experimental group, size effect of meaningful difference is high level (η^2= 36.5).

Findings regarding the fifth sub problem

Table 5. *Independent samples t-test results related to the comparison of experimental and control group achievement scores*

Group	*N*	Post-test	Pre-test	Achievement	*sd*	*df*	*t*	*p*
Experimental	23	14.35	10.00	4.35	4.14	44	2.696	.01
Control	23	11.65	10.22	1.43	3.12			

Table 5 presents experimental group students' mean pre and post-test achievement scores as M_{achexp}=4.35 and mean post test scores as $M_{achcontrol}$=1.43. Although both groups show significant differences in post-tests, difference between the means was found to be in favour of the experimental group ($t_{(44)}$= -2.696; p< 0.01). Table 6 presents these findings that support this result. The size effect of meaningful difference in favour of experimental group between the means of differences of points of pre and post achievement test scores of experimental and control groups is high level (η^2= 14.1).

Table 6. *Percentages of frequency and difference regarding experimental and control groups' misconceptions*

Concept		Experimental Group				Control Group			
	Nr.	Pre Test	%	Post Test	%	Pre Test	%	Post Test	%
Constitution	1	21	91.3	23	100	21	91.3	17	73.9
	2	17	73.9	22	95.7	17	73.9	22	95.7
Independence	3	20	87.0	21	91.3	20	87.0	13	56.5
	4	13	56.5	18	78.3	13	56.5	15	65.2
Republic	5	6	26.1	15	65.2	6	26.1	9	39.1
	6	13	56.5	20	87.0	13	56.5	15	65.2
Democracy	7	21	91.3	20	87.0	21	91.3	21	91.3
	8	3	13.0	13	56.5	3	13.0	9	39.1
Government/State	9	6	26.1	11	47.8	6	26.1	4	17.4
	10	5	21.7	12	52.2	5	21.7	6	26.1
Public opinion	11	14	60.9	17	73.9	15	65.2	20	87.0
	12	18	78.3	23	100	18	78.3	22	95.7
Centralized administration	13	9	39.1	17	73.9	8	34.8	12	52.2
	14	10	43.5	18	78.3	11	47.8	16	69.6
National sovereignty	15	15	65.2	22	95.7	15	65.2	19	82.6
	16	14	60.9	20	87.0	14	60.9	17	73.9
Local administration	17	9	39.1	18	78.3	9	39.1	11	47.8
	18	15	65.2	18	78.3	15	65.2	16	69.6

Examination of Table 6 shows that teaching by means of conceptual change texts in the experimental group was more effective in teaching concepts of *"constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty, local administration"* compared to traditional teaching methods. Table 5 presents a significant increase in the experimental group in all items other than one question that aims to measure the concept of democracy, achievement level in the control group was lower and concepts were not sufficiently learned in some items (*republic, democracy, government/state and central administration*).

Result and discussion

The study aimed to identify the effects of conceptual change texts in teaching concepts in "People and Management" unit. The results present that in terms of learning the concepts of *constitution, independence, republic, democracy, government/state, public opinion, centralized administration, national sovereignty* and *local administration,* the experimental group that utilized conceptual change texts -one of the concept change approaches- was more successful compared to the control group that utilized traditional teaching methods developed according to constructive approach. In other words, it can be claimed that

conceptual change texts facilitate student comprehension of concepts. This finding is consistent with the results of various other studies in which conceptual change texts were used (Akbal, 2009; Akbaş, 2008; Aydın, 2007; Cerit Berber & Sarı, 2009; Çaycı, 2007; Dilber, 2006; Durmuş, 2009; Gürbüz, 2008; Sevim, 2007; Şeker, 2006; Şeker, 2012; Tamer, 2006; Ural Keleş & Aydın, 2012; Yılmaz, 2010).

Mean pre-test scores of the experimental class where conceptual change texts were used and control class were traditional methods were utilized are as follows: M_{exp}=10.00 and $M_{control}$= 10.22. Group means show no significant differences between experimental and control groups' levels prior to implementation ($t_{(22)}$=0.272; p> 0.05). Pre-test results did not point to differences between experimental and control groups and the readiness levels of both groups were found to be equivalent probably due to exposure to similar learning processes and experiences.

Following the experimental procedures of the study, mean arithmetic PMAT scores of experimental and control groups were found as follows: M_{exp}=14.35 and $M_{control}$=11.65. Group means point to significant differences in favour of experimental group in terms of post test scores ($t_{(22)}$=3.787; p< 0.05). This result presents that teaching through conceptual change approach is more effective in increasing student achievement compared to teaching with traditional methods. Conceptual change texts have a different structure than course-books and conventional texts. A more effective teaching of concepts process is carried out by giving the distinctive specifications and agreeable and disagreeable examples about the related concept in the conceptual change texts. Martorella (1998) states that some problems will be experienced in the learning process of the concepts if the definitions or teachings of the concepts the students encounter aren't done without considering their distinctive features. In the test group of this study, emphasizing the features of the concepts while teaching them may have made contribution to better understanding of these concepts.

Control group students that were taught with traditional methods obtained the following pre and post-test PMAT scores: $M_{pre\text{-}test}$= 10.22 and $M_{post\text{-}test}$= 11.65. Results of pre and post tests show meaningful differences in the control group in favour of the post-test ($t_{(22)}$=2.206; p< 0.05). This finding shows that traditional teaching was effective in increasing achievement in "The People and Management Unit". Such as the conceptual change approach used in experimental group, traditional teaching method used in the control group significantly increased post test scores of students. "The People and Management" unit was studied in the control group class and teaching was provided albeit with traditional methods. Sarı-Ay (2011) also identified increases in control group in post test scores. However, the experimental group that utilized conceptual change texts presented higher achievement levels. Similarly, the results obtained in studies where control groups also increased their achievement as a result of traditional methods are consistent with the results of the current study (Cerit, Berber & Sarı, 2009; Ural, Keleş & Aydın, 2012).

Experimental group students obtained the following pre and post-test PMAT scores: $M_{pre\text{-}test}$= 10.00 and $M_{post\text{-}test}$= 14.35. Examination of pre and post-tests shows significant differences in the experimental group in favour of the post-test ($t_{(22)}$= 5.036; p< 0.05). This results points to the effectiveness of teaching based on change approach in increasing achievement in "The People and Management" unit.

Findings regarding the third and fourth sub problems indicate that both *conceptual change approach* and *traditional teaching* were effective in increasing student achievement about concept learning. Statistical analysis of data for both experimental and control groups presents significant level increase in favour of post-tests. This points to the

effect of teaching in the control group albeit with traditional methods. However, while pre and post-test mean achievement scores in the experimental group was M_{achexp}= 4.35, this value was found to be $M_{achcontroll}$= 1.43 in the control group. While there was a significant increase in both groups in favour of post-tests, mean achievement difference was found to be in favour of the experimental group ($t_{(44)}$= -2.696; p< 0.01). This finding demonstrates that conceptual change approach is more effective compared to traditional approach in teaching concepts. Researches show that presenting only a simple definition of a concept doesn't necessarily require the acquisition of the concept (Tennyson & Park, 1980). Table 6 presents that students in experimental group still have difficulty in learning democracy concept and control group students have difficulty with the following concepts: *republic, democracy, government/state and central administration*.

Study results demonstrate that the experimental group taught with the help of conceptual change texts, one of the conceptual change approaches, was more successful in learning the concepts in "The People and Management" unit compare to the control group taught traditionally. Some suggestions are provided in line with research results:

- This study utilized conceptual change texts to overcome misconceptions of 4th grade students regarding the concepts included in "The People and Management" unit. Various conceptual change texts can be prepared and used for different Social Studies units and topics.
- Teachers may be provided with in-service training courses geared to inform them about the preparation and implementation of conceptual change texts and the approach can be disseminated widely.
- Since teachers are the basic implementers of the conceptual change texts teacher candidates attending faculties of education can be trained about conceptual change texts.
- Social Studies textbooks may include conceptual change texts related to subject matters included in the curriculum as alternative activities in order to help overcome misconceptions

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References

Akbal, E. (2009). Ortaöğretim kimya eğitiminde mol konusunun öğretiminde kavramsal değişim metinlerinin başarıya etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Marmara Üniversitesi, Eğitim Bilimleri Enstitüsü, İstanbul.

Akbaş, Y. (2008). Ortaöğretim 9. sınıf öğrencilerinin iklim konusundaki kavram yanılgılarının giderilmesinde kavramsal değişim yaklaşımının etkisi. Yayınlanmamış Doktora Tezi, [Unpublished Master Thesis] Atatürk Üniversitesi, Sosyal Bilimler Enstitüsü, Erzurum.

Altuntaş Aydın, M. (2011). Model ve kavramsal değişim metinlerinin birlikte kullanılmasının ilköğretim 7. sınıf öğrencilerinin "atomun yapısı" konusunu anlamaları üzerine etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Karadeniz Teknik Üniversitesi, Eğitim Bilimleri Enstitüsü, Trabzon.

Aydın, G. & Balım, A. G. (2013). Kavramsal değişim stratejilerine dayalı olarak hazırlanan fen ve teknoloji plân ve etkinlikleri. *Eğitim ve Öğretim Araştırmaları Dergisi, 2*(1), 327-337.

Aydın, S. (2007). Geometrik optik konusundaki kavram yanılgılarının kavramsal değişim metinleri ile giderilmesi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Erzurum.

Bal, M. S. & Akış, A. (2010). Sosyal bilgiler dersi "İnsanlar ve Yönetim" ünitesinde karşılaşılan kavram yanılgıları. *E-Journal of New World Sciences Academy, 5*(4), 2061-2070.

Başaran, İ. E. (1994). *Eğitime Giriş* (4. Baskı). Ankara: Umut.

Birinci Konur, K. (2010). Kavramsal değişim metinlerinin sınıf öğretmeni adaylarının fiziksel ve kimyasal değişme konusunu anlamalarına etkisi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Karadeniz Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Trabzon.

Cannon, M. W. (2002). Concepts and themes. *Gifted Child Today Magazine, 25*(3), 6-24.

Canpolat, N. & Pınarbaşı, T. (2002). Fen eğitiminde kavramsal değişim yaklaşımı-I: Teorik temelleri. *Kastamonu Eğitim Dergisi, 10*(1), 59-66.

Case, M. J. & Fraser, D. M. (1999). An investigation into chemical engineering students' understanding of the mole and the use of concrete activities to promote conceptual change. *International Journal of Science Education, 21*(12), 1237-1249.

Cerit Berber, N. & Sarı, M. (2009). Kavramsal değişim metinlerinin iş, güç, enerji konusunu anlamaya etkisi. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 27*, 159-172.

Çakır Ö. S., Geban, Ö. & Yürük, N. (2002). Effectiveness of conceptual change textoriented instruction on students' understanding of cellular respiration concepts. *Biochemistry and Molecular Biology Education, 30*(4), 239-243.

Çaycı, B. (2007). Kavram değiştirme metinlerinin kavram öğrenimi üzerindeki etkisinin incelenmesi. *Gazi Eğitim Fakültesi Dergisi, 27*(1), 87-102.

Çeliköz, N. (1998). Kavram öğrenme ve öğretme ilkeleri. *Türkiye Sosyal Araştırmalar Dergisi, 2*(2), 69-71.

Demir, S. B. & Akengin, H. (2014). *Hikâyelerle sosyal bilgiler öğretimi* (3. Baskı). Ankara: Pegam A Yayıncılık.

Dilber, R. (2006). Fizik öğretiminde analoji kullanımının ve kavramsal değişim metinlerinin kavram yanılgılarının giderilmesine ve öğrenci başarısına etkisinin araştırılması. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Erzurum.

Doğan, O. (2007). İlköğretim 5. sınıf sosyal bilgiler dersi "Bir Ülke Bir Bayrak" ünitesindeki kavramların öğrenilmesinin bazı değişkenler açısından incelenmesi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Çukurova Üniversitesi, Sosyal Bilimler Enstitüsü, Adana.

Doğanay, A. (2005). Öğretimde kavram ve genellemelerin geliştirilmesi. C. Öztürk & D. Dilek (Ed.), *Hayat ve Sosyal Bilgiler Öğretimi (Yeni Programa Göre Geliştirilmiş)*. Ankara: Pegam A Yayıncılık.

Driver, R. & Erickson, G. (1983). Theories in action: Some theoretical and empirical ıssues in the study of students, conceptual frameworks in science. *Studies in Science Education, 10*, 37-60.

Durmuş, J. (2009). İlköğretim fen bilgisi dersinde kavramsal değişim metinlerinin ve deney yönteminin akademik başarıya ve kavram yanılgılarını gidermeye etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Selçuk Üniversitesi, Sosyal Bilimler Enstitüsü, Konya.

Dykstra, D. I., Boyle, C. F. & Monarch, I. A. (1992). Studying conceptual change in learning physics. *Science Education, 76*, 615-652.

Eckstein, S. G. & Shemesh, M. (1993). Stage theory of the development of alternative conception. *Journal of Research in Science Teaching, 30*, 45-64.

Gürbüz, F. (2008). İlköğretim 6. sınıf öğrencilerinin "ısı ve sıcaklık" konusundaki kavram yanılgılarının düzeltilmesinde kavramsal değişim metinlerinin etkisinin araştırılması. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Erzurum.

Harwood, D. & Jackson, P. (1993). "Why did they build this hill so steep?" problems of assessing primary children's understanding of physical landscape features in the contexs of the UK national curriculum. *Geographic and Environmental Education, 2*(2), 64-79.

Hewson, P. & Hewson, M. (1991). *The status of students conceptions research in physics learning: Theoretical issues and empirical studies*. Institute for Science Education at the University of Kiel, 59-73.

Hynd, C. & Alvermann, D. E. (1986). The role of refutation text in overcoming difficulty with science concepts. *Journal of Reading, 29*(5), 440-446.

Jahoda, G. (1963). The development of children's ıdeas about country and nationality. *British Journal of Educational Psychology, 33*(1), 47-60.

Karasar, N. (1999). *Bilimsel araştırma yöntemi (9. Baskı)*. Ankara: Nobel Akademik Yayıncılık.

Kılıçoğlu, G. (2011). Sosyal bilgiler derslerinde kavramsal değişim metinlerinin kavram yanılgılarını giderme üzerine etkisi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Koray, Ö. C. & Bal, Ş. (2002). *Fen öğretiminde kavram yanılgıları ve kavramsal değişim stratejisi. Kastamonu Eğitim Dergisi, 10*(1), 83-90.

Linder, C. J. (1993). A challenge to conceptual change. *Science Education, 77*, 293-300.

Martin, D. J. (1997). *Elementary science methods. A constructivist approach*. Kennesaw State Collage. Delmar Publishers.

Martorella, P. H. (1986). Teaching concepts. James, M. C. (Ed.), *Classroom Teaching Skills*. USA: Healty and Company.

Milburn, D. (1972). Children's vocabulary. N. J. Graves (Ed.), *New movements in the study and teaching of geography*. London: Temple Smith.

Morgan, C. T. (1977). *Psikolojiye giriş ders kitabı* (H. Arıcı, Çev.) Ankara: Meteksan Yayınları.

Ocak, G. & Küçükilhan, S. (2014). İşbirliğine dayalı öğrenci takımları-başarı bölümleri (ÖTBB) tekniğinin sosyal bilgiler dersindeki akademik başarıya ve kalıcılığa etkisi. *E-International Journal of Educational Research, 5*(4), 17-40.

Özdemir, A. M. & Dindar, H. (2013). İlköğretim fen ve teknoloji dersinde kavramsal değişim yaklaşımının öğrenme stillerine göre öğrenci başarısına etkisi. *Bartın Üniversitesi Eğitim Fakültesi Dergisi,* 2(1), 288-299.

Öztürk, C. & Otluoğlu, R. (2002). *Sosyal bilgiler öğretiminde edebi ürünler ve yazılı materyaller.* Ankara: Pegam A Yayıncılık.

Riche, R. D. (2000). *Strategies for Assisting Students Overcome Their Misconceptions in High School Physics*. Memorial University of Newfoundland Education 6390.

Roth, K. J. (1985). *Conceptual Change Learning and Student Processing of Science Texts*. Paper Presented at the Annual Meeting of the American Educational Research Association, (69th, Chicago, IL).

Sarı-Ay, Ö. (2011). İlköğretim 8. sınıf fen ve teknoloji dersi maddenin halleri ve ısı ünitesinde belirlenen kavram yanılgılarının giderilmesinde kavramsal değişim metinleri kullanımının etkisi ve öğrenci görüşleri. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Saygın, Ö. (2003). Lise 1 biyoloji dersi hücre konusunun öğretiminde yapılandırmacı yaklaşımın etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Sevim, S. (2007). Çözeltiler ve kimyasal bağlanma konularına yönelik kavramsal değişim metinleri geliştirilmesi ve uygulanması. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Karadeniz Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Trabzon.

Sheridan, J. M. (1968). Children's awareness of physical geography. *The Journal of Geography, 67*, 82-86.

Shiland, T.W. (1999). Constructivism: The implications for laboratory work. *Journal of Chemical Education, 76*(1), 107-109.

Şeker, A. (2006). Atom, molekül, iyon ve madde kavramlarının öğrenilmesinde kavramsal değişim metinlerinin etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Orta Doğu Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Ankara.

Şeker, A. (2012). Kavramsal değişim metni yaklaşımına dayalı öğretim ve öğrencilerin kimyasal bağlar konusundaki kavram yanılgıları. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Orta Doğu Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Ankara.

Tamer, P. İ. (2006). Benzeştirmelerle verilen kavramsal değişim metinlerinin asit ve bazlar konusunda kavramsal değişim yaratmaya etkisi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Orta Doğu Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Ankara.

Tennyson, R. D. & Park, O. C. (1980). The teaching of concepts: A review of ınstructional design research literature. *Review of Educational Research, 50*(1), 55-70.

Terry, C., Jones, G. & Hurford, W. (1985). Children's conceptual understanding of forces and equilibrium. *Physics Education, 20*, 162-165.

Toka, Y. & Aşkar, P. (2002). The effect of cognitive conflict and conceptual change text on students' achievement related to first degree equations with one unknown. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 23*, 211-217.

Topcubaşı, T. & Polat, S. (2014). Sosyal bilgiler öğretiminde kavram karikatürlerinin öğrenci başarısına etkisi. *International Journal of New Trends in Arts, Sports & Science Education, 3*(2), 48-61.

Türksever, Ö. (2013). Coğrafya öğretiminde kavramsal değişim yaklaşımının akademik başarıya etkisi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.

Ural Keleş, P. & Aydın, S. (2012). İlköğretim beşinci sınıf "canlıları sınıflandıralım" ünitesinin öğretiminde kullanılan kavramsal değişim metinlerinin etkililiğinin değerlendirilmesi. *Erzincan Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 5*(2), 133-150.

Ülgen, G. (2001). *Kavram geliştirme.* Ankara: Pegam A Yayıncılık.

Wang, T. & Andre, T. (1991). Conceptual change text versus traditional text application questions versus no questions in learning about electricity. *Contemporary Educational Psychology, 16*, 103-116.

Yazıcı, H. & Samancı, O. (2003). İlköğretim öğrencilerinin sosyal bilgiler ders konuları ile ilgili bazı kavramları anlama düzeyleri. *Millî Eğitim Dergisi, 158*.

Yıldırım, B. (2010). Sınıf öğretmenliği adaylarının gazlar konusundaki kavramlar ile ilgili bilgi düzeyleri ve sahip oldukları kavram yanılgılarının belirlenmesi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Fırat Üniversitesi, Fen Bilimleri Enstitüsü, Elazığ.

Yılmaz, Z. A. (2010). Kavramsal değişim metinlerinin üniversite öğrencilerinin geometrik optik konusundaki kavram yanılgılarının düzeltilmesi ve fizik dersine karşı tutumlarının incelenmesi. Yayınlanmamış Doktora Tezi, [Unpublished Doctoral Thesis] Atatürk Üniversitesi, Fen Bilimleri Enstitüsü, Erzurum.

Yüksel Gülçiçek, N. (2004). Kavramsal değişim metinlerinin öğrencilerin manyetizma konusunu anlamalarına ve fizik tutumlarına etkisi. Yayınlanmamış Yüksek Lisans Tezi, [Unpublished Master Thesis] Gazi üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.