

Efficacy of Creative Drama Techniques in Teaching Changes in Matter

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Abstract

In this study, the efficacy of using creative drama techniques in teaching the subject “changes of matter” for to the students of 4th grade Science and Technology was investigated. The sample group consisted of 27 students from the experimental group and 26 students from the control group formed the sample of the study. In order to collect data, a multiple-choice achievement test was developed and applied to assess the level of achievement level from the concepts of the related subject. The subject and its concepts were taught to the experimental group of students by the developed creative drama activities and to the control group of students by conventional methods. T-test and one-way ANCOVA were used by means of statistical analysis. Collected data was presented in charts and interpreted. Knowledge levels of the experimental and the control groups of students were observed to increase. However, in the analysis based on the achievement pre-tests applied to the experimental and the control groups, the difference between post-test results was found to be significant in the advantage of the experimental group. Teaching by using creative drama techniques was proved to be more effective in improving students' success. It is suggested that teachers need to be good drama leaders as well as having enough content knowledge in order to use creative drama techniques and therefore The Ministry of National Education should provide in-service training seminars.

Keywords: Science and technology, creative drama, changes of matter

Introduction

It is necessary for educational institutions to make plans and programs to train people who have the ability to decide and apply, who can question and perceive the life, who are self-confident, who have communicative and cooperative skills and who can impress other people (Gürol, 2003; Karakaya, 2007). By growing away from conventional educational views, this purpose has led to the development of many new teaching methods and techniques which center the learner and position the teacher as the guide of the learning process (Özsoy, 2003). Drama is one of the evolutions in teaching-learning process.

Drama is defined in separate ways by various people. For example, it is defined as a course of actions to reconstruct a word, a concept, a behavior, a sentence, an idea, a life or an event through previous cognitive patterns by using theatre or drama techniques such as improvisation or role-play by creating games or plays in group work (San, 1999). In another definition, drama is defined as actions and improvisations which participants create based on their own creative findings, individual thoughts, memories and knowledge without any previously written script (San, 1996). Animating various life situations inspired from children games and similar activities, recreating and discussing events and learning and understanding

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from these life situations are also referred to as drama. It is responses of participants with their bodies and voices to a stimulus (Ömeroğlu & Can, 1999). Based on these definitions, it is stated that there are 5 types of application phases of creative drama as a teaching technique in literature (Adıgüzel, 1993).

Warm-up and Relief Activities: These are the activities which help participants to acquire some skills such as using the 5 senses, improving observation skills, doing physical and tactual exercises, introduction, interaction, confidence and concordance by various methods.

Games: These include activities such as playing games freely and developing these games within the certain rules. Sometimes common children's games are used.

Improvisation: As a less definite phase, this progress in certain stages based on the determined topic or theme or pre-determined goal. These are the activities which individual and group creativeness is in the forefront.

Creation: This process begins at an undetermined point before interacting with an item, picture, photograph, sculpture etc. It is indefinite how the process will develop and how it will end.

Evaluation: This can be done before, during or after the practice. After each or several drama phases, opening discussions, starting interactions of critique-auto critique, question-answer are regarded as the actual start of evaluation. At this phase, learning about behaviors of others, their feelings, thoughts, and experiences is important for the person to revise his or her own life.

Drama helps an individual improve their existing creativity, enhance their imagination and enables them to grow versatile by helping them enhance their developmental features. It is believed to be an effective method for individual development. By the help of drama, people can see themselves and their environments not superficially but by deep and universal (Aral, Kandır & Can Yaşar; 2000; Başkaya, 2000; Gönen & Uyar Dalkılıç, 1998). Besides in drama, activities dealing with issues such as parent-child relationships, school relations, city life and problems, and environmental problems participants are informed about such problems and are directed to goals like finding solutions for such problems (San, 1991). It is aimed to train individuals who behave in a democratic manner, which can make connections between issues, who can think independently, and who are tolerant and creative with drama activities (Güneysu, 1999; Öztürk, 1999; Sağlam, 1997).

Drama is a new evolution in education. Memorization-based education restrains children from developing mentally, improving research ability and their relations with other people, sharing and ultimately learning efficiently. However, drama is both an education field on its own and a method which develops children's creativity, trains and prepares them for life (MEB, 1999). Creative drama method, when it is used effectively for all disciplines with correct subject matter and content analysis, provides permanent and meaningful learning (Üstündağ, 2007). One of these disciplines is Science and Technology.

When the aims of Science and Technology in primary education are analyzed, it is determined that the course helps students to recognize and comprehend the environment in which they live and makes these students gain necessary knowledge, skill, and habit in order to live in this environment influentially and harmoniously (Ünal, 1993). Besides, these students especially need activities in which they take part in actively as Science and Technology course deals with and researches events in actual life (Sağırılı & Gürdal, 2002). Drama can be considered an influential way of teaching when it is considered that drama, an activity which is something like a play, arouses the curiosity of the students, therefore the

students can take part in the learning process more actively (Önder, 1999). Practices of drama give the students the chance of using the language which they cannot always use in daily life. With the specified roles, they speak, perform and think according to their characters. Thanks to their roles, they use the language while conveying their notions and learning others' ideas (Farris, 2004). The course becomes easy for the students where they express their notions frankly. Therefore, drama technique enhances the students' ability to attend the lesson and to take the floor in the course.

Bentley and Watts (1989) have stated that drama technique in Science and Technology course helps the teacher to keep the control of the class, increases oral communication and helps the learners to tell their experiences to the external world (Bentley & Watts, 1989).

The effect of 20 and 30 minute plays, which were written and presented by Labow and Sewell (1993), about the scientists such as Newton and Arshimed and consisted of the programs of forth, fifth and sixth degree classes have been observed. After observation, it has been confirmed that the learners are considerably accomplished.

Essential principles about the application of creative drama technique in teaching science in class have been examined by Selvi (2003). In the fifth degree course, in the teaching of the unit "Let's identify our body", the results of creative drama technique and conventional methods have been compared. In the study, by combining observations and findings obtained from literature reviews it has been observed that during the creative drama process the learner has attended actively to the learning-teaching process with intellectual, affective and kinesthetic intelligence. It has come through that to provide learner attendance to the course by creative drama technique it is needed to utilize the method effectively and to apply the principles of application style and requirements accurately.

Çam, Özkan and Avinç (2009) have carried out a comparison study between central primary schools and village primary schools for the effect of Science and Technology courses in Blood, Blood Pattern and Blood Groups Unit in terms of academic achievement and attention to the course. According to the results of that study, it has been reached that although attention to the course has been aroused in both schools' learners; the village school has adopted and been more interested in the drama technique and its application process. A similar study has been carried out by Varelas and others (2010) and concluded that learners' attention and success has increased.

In that study, drama technique has been used in teaching "Matter Change" in Primary School Forth Degree Science and Technology Course Teaching Schedule. In determining the subject, it has been influential that unit consists of many abstract concepts. Cognitive level of primary school first stage learners coincides with the concrete operation period. It is conferred in related literature that subject and concepts such as states of matter, temperature, and heat are hard to comprehend. Basic concepts such as structure of matter and its features, atomy and its structure, granules that constitutes matter, boiling, evaporation, condensation and melting which are all the basis of matter have been observed in the literature and misconceptions of the learners have been specified (Novick & Nussbaum 1981; Gabel, Samuel & Hunn, 1987; Griffiths & Pretson, 1992; Ben-Zvi, Eylon & Silberstein, 1987; Osborne & Cogrove, 1983; Bar & Travis, 1991; Bar & Galili, 1994; Buluş Kırıkkaya & Güllü, 2008). Therefore, it is understood that essential studies should be done in the matter of removing these misconceptions.

For that reason, the aim of this research is to determine the effects of drama technique on learners' success and their attitude to Science in teaching the concepts about "Matter Change". It is considered that thanks to this study, all educators will realize that drama

technique constitutes a positive attitude for the learners towards Science and Technology course and it affects their success in a positive way.

Problem

In this study, it is tested whether there is a significant difference according to some specified features between the group with traditional methods and the group with drama technique on teaching the concepts in “Matter Change” in the Primary School Forth Degree Science and Technology course. In this sense, the problem of this study is this question: “Does the use of drama technique have an impact on teaching the concepts in the “Matter Change” Unit in Primary School Forth Degree Science and Technology course?”

Sub problems

1. Is there any difference between the grades of the experimental and the control group students in pretest and the final test on the unit “Matter Change Concepts Test”?
2. Is there any difference between pre attitude grades and final attitude grades of the experimental group students?
3. Is there any difference between pre attitude grades and final attitudes grades of the control group students?
4. Is there any significant difference among gender factors in regard to the final test grades?

Methodology

The Model of Study

A quasi-experimental method from quantitative research pattern is used in which study. This method involves a testing method in which random distribution is not used for individuals to send experimental and control groups. The experimental model is in the control of the researcher and is a kind of research area in which data, which is to be observed in order to discover cause and effect relation among factors, is generated (Büyüköztürk, 1998; Karasar, 2005; Sencer, 1978). The experimental method is a kind of research model in which the factors whose effect can be evaluated are applied to experimental subjects under specified rules and requirements. Replies of experimental subjects to factors are evaluated and a decision is made by comparing the results obtained (Sümbüloğlu & Sümbüloğlu, 1988). Generally, the best way to research is with the experimental method when the researcher desires to study his subject with “why” questions and cause and effect relationship. Therefore, this study is carried out by a quasi-experimental method as randomize distribution is not used and the cause and effect relation is scrutinized.

Universe and Sample

The universe of the study is Primary School Forth Degree students. The sample group is 53 students with 27 experimental group students from Taşova Belevi Primary School Forth Degree 4/A Class and with 26 control group students from Taşova Ballıdere Primary School Forth Degree 4/A Class in Amasya in the 2011-2012 school year.

Data Collection Tools

“Matter Change Concepts Test” is used by the researchers so as to identify the changes in students’ success when the drama technique is applied in class. Also, an attitude survey is used to determine students’ attitude to drama technique and Science.

Matter Change Concepts Test

“Matter Change Success Test” is developed by the researchers and used to evaluate students’ success to the Matter Change subject and concepts. In the test there are 25 multiple

choice questions which are about relevant subject and appropriate for the forth degree Science and Technology course teaching program. Content validity of the test is provided by discussions of leading expert academics. The test's final state is decided to be 20 questions after a pilot scheme. KR-21 reliability coefficient of the achievement test is calculated as 70 after calculations in a pilot scheme.

Science and Technology Course Attitude Scale

The Science and Technology Course Attitude Scale (FBDTÖ) is to identify students' attitude to the Science and Technology course and is applied to experimental and control group students before and after the study. It has been developed according to a five point likert scale which is used in the study by Germann (1994). Some items in the new scale that is based on five point likert scale have been changed (Ören, 2005). That scale, which has been prepared to evaluate students' attitude to the Science and Technology course, constitutes of 22 items. It is a kind of five point likert scales as "I wholly agree", "I agree", "I am not sure", "I do not agree", "I do not wholly agree". It is asked that students for put an (x) for the answer which is the best suited for them. Cronbach alpha internal consistency coefficient of scale has been calculated and found as .925. This scales approach to 1 means that reliableness increases in the meaning of internal consistency. Expert opinion has been taken for the test's validity (Ören, 2005).

Application

In the application stage, 4/A from Amasya Taşova Belevi Primary School and 4/A from Amasya Taşova Ballıdere Primary School have been chosen as application classes as class sizes and students' gender is close to one another. Data collection tools have been applied to chosen classes (the experimental and the control group students) as pretesting in order to evaluate students' attendance level before starting the subject. The application has been started synchronically to the National Education Science and Technology Teaching Schedule.

The "Matter Change" subject has been applied with drama technique to the 4/A class (experimental group) from Amasya Taşova Belevi Primary School and with conventional methods to the 4/A from Amasya Taşova Ballıdere Primary School which forms control group students; and student acquisition has been considered. Courses have been taught by the same teacher in application. The teacher has been controlled as, fixed variety in order to remove probable academic achievement difference between the two groups because of different teachers. Data collection tools which have been developed after application have been applied as final tests.

Activity development process is displayed below respectively in that study which is carried out by drama technique. While the plans about the relevant subject are prepared, development process concepts aim, content education and testing conditions are considered. In following stages, each activity is determined and prepared by regarding all concepts of schedule development (Üstündağ, 2006). Besides, all the stages and components of creative drama are included in activity plans in the manner that they will be provide integrity with Science and Technology teaching. There are different approaches in relevant literature about drama stages and components. By examining those approaches, the stages that have been proposed by Adıgüzel (2006a; 2006b) are taken into consideration. In the reformed activities, creative drama stages; *preparation, enaction and assessment*; creative drama components; *drama techniques, to pretend that it is time for, dramatic moment, teacher and student roles, group studies, periods like play and effects of past experiences* have been studied (Adıgüzel, 2006a; 2006b; Akar, 2000; San, 2003; Üstündağ, 2006). Those activities which are developed by researchers have been reviewed by drama experts, necessary arrangements have been finalized, and activities are finalized.

Activity: Change of State

Subject: Change of State

Duration: 40+40

Course: Science and Technology

Class: 4

Tools:

Techniques: Role play, impromptu

Acquisitions:

1. S/he shows melting change that temperature causes to solid matters.
2. S/he represents that it changes into solid form when liquid is made cool.
3. S/he expresses the melting and degradation state that temperature causes to solid matters.
4. S/he deduces that the warm-up and cooling down process is occurred by heat exchange.
5. S/he realizes that rain; snow, ice and fog are water.
6. S/he associates that water evaporates when warm and vapor condenses when made cool.
7. S/he explains that liquid evaporates by taking heat and vapor gives heat while condensing.
8. S/he role plays.
9. S/he displays impromptu.
10. S/he thumps out correctly.

I. Preparation

- First of all, it begins with a story. “It was through the end of January. As Elif saw snow for the first time and it was a holiday, she was very happy. She made a huge snowman on the balcony with snow that she collected from outside. When she woke up in the morning, she said goodbye to her snowman and went to her boarding school. Every day that she spent at school, she prayed to go home in time and attend to her snowman. The weekend came and when Elif went home and could not see the snowman she became very sad. She thought that her mum threw away her snowman. She asked her mum and her mum explained that it was because of warm weather.
- It is about controlling students’ attendance. The students go into a huddle. A voluntary attendee holds his/her hand and runs to one of the friends by using concepts related to “The States of Matter and Temperature”. The other attendee on whom this attendee knocks his/her hand repeats the same issue by using a different concept.

II. Enaction

- A group is formed with 10 students. It is said that each of these students is a granule. Matter’s change of state is to be shown. Therefore, the students are arranged in an order and they correlate with their arms and they make a smooth structure. It is said that this position is our solid state. The teacher gives orders as heat is coming and we are getting warm, then the groups with 10 students begin to splinter off by pulsing and they become single. Their pulsing and splintering off is their melting. Single students change their names and they become liquid. After that, the teacher gives orders by saying heat is coming and we are getting warm, the students shiver and bend down. This is evaporation. Their state on the ground is their gas state. The opposite state of this issue is to say to the sitting single students to give me some heat and I am giving heat and they will stand up by shivering. Standing up by shivering is condensation and standing up in a single way is

liquid. Again, by saying give me some heat and by making ten students together by shivering is freezing and constituting a group with 10 students is the solid state. In this way, it is exemplified that ice becomes liquid by taking heat and then becomes gas by taking more heat.

III. Assessment

- One of the students is chosen voluntarily to thump out. It is desired from students that they close their eyes and make movement based on the rhythm. It is also stated that they are supposed not to state stable. It is asked to students that what sort of changes have occurred on their acts as the rhythm has changed. Replies are evaluated briefly. In the evaluation, they express what sorts of changes have occurred by rhythm change. Rhythm is liken to heat. By asking the reason of disappearance of snowman at the beginning, assessment and evaluation is made in other stories and rigmарoles.

Data Analysis

In the study, teaching method is evaluated as the independent variable and achievement and attitude is evaluated as the dependent variable. Statistical analysis is done with the help of SPSS 15.0 packaged software. When there is an independent variable and dependent variable or there are more than one variable in evaluating the data, one-way ANCOVA, which is supposed to be used in order to identify if there is a significant statistic difference between the groups, (Kalaycı, 2006) is applied. ANCOVA is known as a technique, which helps to control one or more than one variable statistically that is related to the dependent variable apart from a factor or factors (Büyüköztürk, 1998). Students' pretesting results have been used as co-variable, and therefore the problem of inequality between the groups has been removed.

T test is also made for related samples so as to identify the difference between pretesting and final testing results of students in the analysis of attitude grades. Independent t test is made in order to determine if there is a significant difference among genders based on final tests.

Findings and Discussion

Findings taken from that study which is applied to determine the effect of drama technique in teaching of the Science and Technology course "Change of Matter" subject, in academic achievement and in attitudes to the course are presented below considering minor problems.

Sub problem 1: Is there any difference between the Matter Change Concept Change pretesting and final testing grades of the experimental and the control group students?

The ANCOVA test is applied for controlling pretesting grades, because pretesting grades can affect final test grades in the application. According to analysis results, the effect of pretesting grades on final test grades of students is nonsense ($p > 0.05$, $p = 0.242$). It is supposed that Levene test is bigger than 0.05 and variations are equal and comparisons are done ($p = 0.855$, $p > 0,05$). When students' pretesting grades are controlled, it is seen that there are changes in students' final test grades. Revised final test grades of students based on controlling pretesting grades are given in Table 1.

Table 1. “Matter Change Concept Test” revised final test grades of pretesting grades

| <i>Group</i> | <i>N</i> | <i>Mean</i> | <i>Revised Average</i> |
|-------------------|----------|-------------|------------------------|
| <i>Control</i> | 26 | 47,80 | 46 |
| <i>Experiment</i> | 27 | 66,40 | 68 |

When Table 1 is analyzed, it shows that the final test average grade of control group is 47,80, experimental group is 66,40. It is confirmed that there is a difference and final test findings of the experimental group is higher. Final test revised results of experimental group is 68, control group is 46. Findings from the ANCOVA test, which is applied in order to determine if there is a significant difference between revised final test grades of the groups, are displayed in Table 2.

Table 2. Variation Analysis Results about Students’ Achievement

| <i>Variation Root</i> | <i>Total Square</i> | <i>SD</i> | <i>Mean Square</i> | <i>F</i> | <i>p</i> |
|-----------------------|---------------------|-----------|--------------------|----------|----------|
| <i>Pretesting</i> | 4908,56 | 1 | 4908,56 | 11,24 | 0,02 |
| <i>Group</i> | 6095,23 | 1 | 6095,23 | 13,96 | 0,00 |
| <i>Error</i> | 21833,105 | 50 | 436,66 | | |
| <i>Total</i> | 205141,90 | 53 | | | |

When Table 2 is examined, it is seen that there is not a significant difference of pretesting results on the groups but there is a significant difference on the achievement ($F_{(1,50)}= 6095.227$, $p<0.05$) between the groups. Related to that, it occurs that there is a significant difference on behalf of experimental group students and it is based on the findings obtained from the Bonferroni test which is done among final test grades of the experimental and the control group ($X_e=68$, $X_c=46$).

It can be said that teaching the Primary School Forth Degree Science and Technology course “Matter Change” subject with creative drama technique is more effective on students’ success than a conventional teaching method. When cognitive level of Primary School first grade students, it can be said that it increases students’ achievement because drama techniques are fun, it makes students attend the class actively, saves the course from monotony, contains entertaining studies, and helps the students by putting them in the place of the concept. Besides it can be considered that it helps students to learn significantly and permanently as there occurs wholly collaborative learning, learned data is shared and studies are appreciated. Also this finding shows parallelism with research data which is about the subject of whether creative drama technique increases access in other subject areas (Kamen, 1992; Duatepe & Ubuz, 2004; Üstündağ, 1998; Özsoy, 2003; Sarıçoban, 2004; Koç,1999; Beyazitoğlu, 1996; Braund, 1999).

Sub Problem 2: Is there a difference between pretesting and final test attitude grades of experimental group students?

T test is done for related sample to identify the difference between pretesting and final test attitude grades of the experimental group students connected with this minor problem. Findings obtained from analysis results are shown in Table 3.

Table 3. t test findings of pretesting and final test attitude grades of the experimental group students

| <i>Attitude</i> | <i>N</i> | <i>X</i> | <i>S</i> | <i>SD</i> | <i>t</i> | <i>p</i> |
|-----------------------|----------|----------|----------|-----------|----------|----------|
| <i>Pre Attitude</i> | 27 | 4,53 | 0,47 | 26 | 0,26 | 0,80 |
| <i>Final Attitude</i> | 27 | 4,52 | 0,46 | | | |

It is seen that attitudes of experimental group students have not changed after the study ($t_{(26)}= 0,26$ $p= 0.80$). Attitude is inclination of positive or negative reaction learned against specified subject, occasion, institution or other people (Tezbaşaran, 1996). Attitudes are not observed directly, but attitudes of individuals affect their love, hate, and behavior considerably (Morgan, 1995). It takes a long time to change attitudes (Balci, 1995). For that reason, stationary state of pretesting and final test attitude grades of experimental group shows parallelism with related literature. When it is considered that relevant study time takes in a short time, in 4 weeks, it can be said that this issue is normal. In spite of the fact that creative drama technique is appreciated by the students and studies are carried out in an amusing and entertaining way, it can be interpreted that it is hard to change the attitudes.

Sub Problem 3. Is there a difference between pretesting and final test attitude grades of the control group students?

T test is done for the related sample to identify the difference between pretesting and final test attitude grades of the control group students connected with this minor problem. Findings obtained from analysis results are shown in Table 4.

Table 4 t test findings of pretesting and final test attitude grades of the control group students

| <i>Attitude</i> | <i>N</i> | <i>X</i> | <i>S</i> | <i>SD</i> | <i>t</i> | <i>p</i> |
|-----------------------|----------|----------|----------|-----------|----------|----------|
| <i>Pre Attitude</i> | 26 | 4,04 | 0,56 | 25 | -0,85 | 0,40 |
| <i>Final Attitude</i> | 26 | 4,09 | 0,56 | | | |

It is seen that attitudes of the control group students have not changed after the study ($t_{(25)}= -0,85$, $p=0,40$). It is an expected state to identify that there is not a significant difference between students' pre and final attitude grades in control group studies conducted with conventional teaching methods as it happens in experimental group studies conducted with creative drama activities. It can be expressed that the change of attitude to Science is not related to the student-centered or teacher-centered teaching. This finding shows parallelism to study results found in relevant literature (Ünal & Ergin, 2006; Şaşmaz Ören & Tezcan, 2004).

Sub Problem 4: Is there any significant difference among gender factors in regard to final test grades?

Independent t test is done to identify whether there is a significant difference among gender factors in regard to final test grades. Although girls' final test achievement grade average is higher than boys' final test achievement grade average, it is seen that there is not a difference between genders in regard to the results of final test grades ($X_G=62,35$, $X_B=51,56$). As it is in the relevant literature, it also can be said in this study that gender is not a significant difference statistically in learning concept (Taşdemir & Tay, 2007;

Tezcan & Bilgin, 2004; Aydede & Matyar, 2009). As there is not a significant difference between students' gender and their success, it can be interpreted that fair crack of the whip is given to both sexes and they show similar inclinations to the course.

Result and Suggestions

In this study, the effect of creative drama technique on students' achievements in regard to cognitive levels in the teaching of concepts in the Primary School Forth Degree Science and Technology course the "Matter Change" subject is researched.

After the committed analysis, it is found that the difference between achievement final test grades of the experimental and the control group students is significant ($p: .00$) at the level of $p < .05$. Based on that result, there is a significant difference between achievement final test grades of experimental and control group students in the Science and Technology course Matter Change subject and that the difference is on behalf of the experimental group. According to that, it is concluded that the teaching conducted with the help of creative drama technique is more effective on students' success than the teaching which is the teacher based conventional method.

Besides, in that study, attitudes of the experimental group students to the Science and Technology course is determined as pretesting and final testing. With the help of analysis findings, it can be said that there is not a significant difference statistically between pretesting and final test attitude grades of the experimental group students (at the level of $p < .05$, $p: .80$). Similarly, the attitudes of the control group students to Science are determined by comparing pretesting and final test grades. According to analysis findings, it is confirmed that there is not a significant difference among attitudes as it is in the experimental group (at the level of $p < .05$, $p: .40$). For that reason, it is deduced that it is hard to change the attitudes in applications conducted in a short time.

There is not a significant change among the forth degree students' success in terms of their sexes. When school girls' and boys' achievement final test arithmetic grades are examined, it is seen that final test achievement grades of boys are higher than girls. Finally, it is proven that it is impossible to change the attitudes in a short time. So, it can be concluded that Science studies conducted with activities such as educational games and creative drama do not contribute positively to their attitude to Science.

On the grounds of the results of this study, the following suggestions can be brought forward:

- After the research, creative drama activities in the Science and Technology course should be given place in teaching and learning process of Primary School I and II level students as there is a significant difference between final test grades of forth degree students.
- Learning environments where drama activities can be done in Primary Schools should be prepared.
- It is necessary for the teachers to have field information and be a good leader to use drama technique. Therefore, Ministry of National Education should open in-company training courses with the subject of drama for the teachers.
- It is highly important that there should be "Creative Drama and Applications" in all the schedules of the faculty of education courses as compulsory lesson.
- At the teaching schedules and teaching plans, it is necessary that clues and suggestions about the application of creative drama technique should be given place and those applications should be popularized for other lessons in cooperation with drama leaders. Guidebook about the techniques used in teaching and about the detection of techniques

and strategies and about their application should be prepared for the teachers. Books, CDs, websites and schedules should be prepared to inform the teachers.

- Educators from different disciplines should come together and identify probable superiorities and restrictions of drama technique to the application of different subjects in teaching environment.
- The teaching conducted with the methods such as creative drama in which students are active should be conducted in long periods. It should be taken into consideration that these kinds of activities should not be for short periods in order to improve students' affective skills towards Science and the teacher should make the students active in almost all the courses as it is required in the teaching schedule.

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