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Effects of Curriculum Layered and Creative Drama Methods on 6th Grade "Force and Motion" Unit on Achievement, Attitude and Retention*

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Abstract

The purpose of this study was to compare layered curriculum and creative drama methods on 'Force and Motion' unit of Science and Technology at 6th grade course, for the academic achievement, attitude towards Science and Technology courses and the effects of retention of knowledge; and to determine which method is more effective experimentally. The other aim of this study was to reveal students' opinions related to both methods. In this sense, mixed method strategy with combination of quantitative and qualitative data was used in this study.

The research was conducted on 44 students who were attending on 6th classrooms in a primary school placed in south Antalya, in 2011-2012 academic year. In this study, one experimental and one comparison group was constructed. The subjects were taught with creative drama method in I. and with layered curriculum method in II. comparison group. In this research, the quantitative data was collected by using achievement test, the attitude scale and learning scale inventory; qualitative data was collected by using observation forms, process evaluation and semi-structured interviews. Data were collected on both quantitative and qualitative methods , and analyzed by using SPSS program (frequency and percentage calculations, ANCOVA) and qualitative analysis method (coding, thematization) respectively.

According to results of the study, both of creative drama and layered curriculum methods have positive effects on academic achievement and retention of knowledge. It was determined that the academic achievement of experimental group of creative drama was higher than the comparison group of layered curriculum. However, it was concluded that both of these methods hadn't any statistically significant effect on the students attitude towards Science and Technology course, it had seen an significant increase in interest of students, according to information obtained from qualitative data collection tools.

Keywords

Creative Drama

Layered curriculum

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Introduction

In Turkey, individual differences of the students have come to the forefront with the change of the education programs that was carried out in the year of 2005. When the constructivist approach which is the philosophy of the new program is taken into consideration, individual differences have gained more importance. Because the preliminary experience of the students are taken as a basis in the constructivist approach. The "constructivist'' is the processing and constructing information by the students. In other words, they do not get information with fidelity directly but, they reconstitute their information. Along with the available information they have, they learn the new information by adapting it to their subjective situations (Özden, 2003, pp. 54-55). According to constructivist, learning is not something that perceives the information passive and it is the procedures of configuring and reconfiguring the understanding of the learner relevant to facts actively and continuously (Atasoy, 2002, pp. 7). It is performed learning through active participation in constructivist learning which takes active role in learning by such as defending, sharing of, questioning about ideas instead of reading and listening solely (Perkins, 1999, pp. 7). The learning style shows trends or preferences of individuals for learning. It enables recognition of individuals, determining and understanding differences between them, receiving responses in learning environment. Therefore it requires utilising important learning approaches which considers cognitive, emotional and psychological features of individuals (Mc Keachie, 1995).

The new science program is student centered; activity based and concentrates on active learning. It can be adapted and used in parallel with creative drama, as it focuses on the means instead of the end, as it is theme based and requires intellect and body working together, which thus making creative drama an excellent educational tool (Adıgüzel, 2013, p. 54). This method has an important role in the development of the students in many aspects. Because learning by drama method by doing and living it is more permanent and funnier. The children will be able to both develop their creativeness and live the achievement by providing an individual satiation, gain friends, express themselves, progress in terms of their language development and they will be able to waste their energies in the positive way (Selimhocaoğlu, 2004, p. 5).

San (2002) stated that, using of creative drama in education prepares the existing information to be reviewed, questioned from different angles. As the important thing in the education is being able to save the student being important in the education from the listener situation, awake him/her with his/her body and notions and being able to make the topics liveable by animating them, creative drama can be taken into hand as an appropriate option within this process. By this way, the student is effective in the learning process and by learning from the thing that he/she does, on the other hand he/she stimulates his/her senses or he/she lives the events (Üstündağ, 2010, p. 25). With the aim of carrying out creative drama method in the education process more effectively, the students giving the lesson at specific steps is recommended Adıguzel (2006, p. 25); divided drama into 3 parts as 1. Preparation – warm up, 2. Improvisation, 3. Assessment. These steps and examples from the study are as following:

I. Preparation – Warm Up Activities: The studies that will awake the body, in which emotions are simultaneously used densely, withdrawn studies are done to be able to constitute a group dynamic such as gaining reliability and orientation were done in preparation step of this study as recommended by Adıguzel (2006). The main object of this step is to constitute a group dynamic and it carries the feature of being preparation to the next step.

II. Improvisation: It is a step in which the subject formed, detected, shaped within the process. It is a stage in which improvisation, making role and other was used as a starting point within the frame of the subject to be animated. All life, sharing and assessments in the creative drama studies were carried out in accordance with improvisation, results and tracks constituted the formation studies done at this step. The improvisations in this step may be small or big groups as well as individual.

III. Assessment: the results obtained from creative drama studies were assessed at this step. In other words, nature, importance, quality and quantity of the process were detected at this step. Share of the emotions and opinions were taken at this step. Whether the learned ones were turned into an acquisition or not and whether these will affect their future life and share of emotions and opinions towards how all drama life and processes were perceived and understood were discussed at this step. Assessment, providing interaction, making share, being able to make constructive criticism, taking positive emotions from drama studies and being able to express their life were provided. It is a stage providing the participants leaving drama environment with funny feedbacks. Being aware of the emotions of the other participants in the drama group was given opportunity (cited in Okvuran, Akyol, 2003).

Play is laid behind the creative drama method that dynamizes the student in the process. Also drama uses some part of theatre techniques in somehow. But creative drama does not carry the meaning that neither acting nor performing because it does not bear a written text and it is not staged. It only announces the factor of ''having fun and taking pleasure'' to the participants by means of playful and theatrical dimensions that it contains. There is no a starting and end part in the drama studies in which event, aspect and information is reconfigured same as theatre but there are specific rules and endless freedoms within these rules same as children plays (cited in San, Bertiz, 2005).

When the literature is analyzed, it has been seen that creative drama method is effective teaching tool for the science and technology lesson. It has been seen that the errors of the students are removed with this method (Başkan, 2006), they find the opportunity to gain information about lives and stories of the scientists and their contribution to the science by living and internalizing them (Özdemir, & Üstündağ, 2007). Şahin and Yağbasan (2012) prepared a lesson plan that will draw the attention of the students and motivate them to the lesson with the aim of reifying the physics and correlating physics aspects of the students with the daily life and in which creative drama will be used as the method. Pantidos, Spathi and Vitoratos, (2001) stated that the physics being more enterable more understandable and more familiar are achieved with creative drama. Oğur and Kılıç (2005); Kahyaoğlu, Yavuzer and Aydede (2010) and Yılmaz (2010) in their research, investigated the effect of creative drama in science teaching and found that significant differences in a favor of the creative drama method at post-test scores compared to traditional methods.

One of the methods that provides learning of the students and takes the individual differences of the students into consideration is ''Layered curriculum'' and was developed by education psychologist Dr. Kathie F. Nunley (2007). Layered curriculum program is based on a mentality that each learner has different learning style, size of intelligent, readiness for learning and dialectics. Therefore, same as in this study, teaching activities should be planned by taking into account these differences and should be applied to all students in the classroom. The targets at the layered curriculum program is determined in accordance with three different layer defined as A, B and C and it is configured in accordance with Bloom taxonomy. It is expected that all the students whose pre-learning, learning levels, interests, expectations, learning styles and requirements show difference via applied activities will reach these targets (Demirel, 2006, p. 243); Through an extensive menu served with learning activities, active participation of all learners are provided during the process (Koç, & Şahin, 2014, p. 288). According to Nunley (2007), the layers at the layered curriculum method are as follow:

C Layer: Includes main information and understanding. The student configures his/her main information at C layer.

B Layer: Application and use of the information that was learned at C layer. The tasks require problem solving or other higher level thinking take place at this layer.

A Layer: Critical thinking and analysis is realized at this layer. This layer requires complicated and the highest level thinking.

Layered Curriculum and Bloom's taxonomy have similarities. Bloom's Taxonomy has six layers starting with the least complex to the highest level of thinking (Latesky, 2008). Information, comprehension, application, analysis, synthesis and assessment layers at Bloom taxonomy is seen within C (information and comprehension), B (application) and A (analysis, synthesis and assessment) layers (Başbay, 2005a, p.241). Hence it is required that high number of tasks towards main information and skills and comprehension of these have to be presented to the students at C layer. If quality learning is not provided at C layer, the tasks at upper levels may be found as difficult by the students.

One of the important features of layered curriculum program is assessment. Layered curriculum program is a process that learners have opportunities to asses themselves, to determine their deficiencies and to identify their learning speed. In the assessment process of the layered curriculum, it is benefited from student progress files, the self-defences and grading keys. The primary objective of this assessment is not only to scale academic achievement but also to observe progress of the student program, to lead her/him and to ask her/him what she/he chose and why she/he chose, throughout layered curriculum (Yılmaz, & Gültekin, 2013, p. 29).

There are not enough research about layered curriculum program in the literature. In the carried out studies, it was seen that thinking skills of the students were developed by layered curriculum method, they focused their attentions easier and they had more attainments as the process was more efficient along with the activities (Demirel, Şahan, Ekinci, Özbay, & Begimgil, 2006; Nunley, 2003; Overstreet, & Straquadine, 2002; Yılmaz, 2010). Also it was seen that understanding of the students were increased with layered curriculum method (Maurer, 2009) and retention of the students were provided (LaSovage, 2006). In the study of Aydoğuş (2009), it was investigated that the effects of layered curriculum method for the academic achievement at the science and technology course, in the study of Başbay (2005b) it was investigated that layered curriculum program which supported with project-based learning approach.

The Aim and Significance of the Study

The main objective of Science lessons is not to learn the concepts and principles by heart but to teach them how to learn and while doing this to support their thinking skills, creativity, their researcher and interrogative personalities in their early ages (Lind, 2005). In many studies it was stated that students had difficulties in science lessons to learn the concepts and principles and the main reasons were stated as to get an education far from their daily life and the concepts were so abstact for the to learn (Taber, 2002; Uyanık 2007). According to Science Lesson Curriculum, for planning and programming lessons, the learning environments (problem, project, argumentation, cooperative learning, etc.) are important factors and it was stated that students should be more active, teacher should be a leader and director. In order for information which is learned by the students to be meaningful and permanent, in classroom and out of classroom learning environments by students, should be designed according to research and inquiry-based learning strategies (MEB, 2013). When these issues were taken into consideration, it could be seen from data obtained from other studies in the literature that creative drama and layered curriculum method compared with the conventional education on academic achievement, a result is expected which will be in favor of these methods. During the application period, because, there were only two 6th grade classroom in her school, the researchers selected two classroom which are assigned to layered cirruculum and creative drama methods. If a control group was added to the study, a result which were in favor of experimental group was expected as in many research study (Akköse, 2008; Aydoğuş, 2009; Başkan, 2006; Bozoğlu, 2007; Demirel et al., 2006; Kahyaoğlu et al., 2010; Küçüker, 2004; LaSovage, 2006; Maurer, 2009; Nunley, 2003; Oğur, & Kılıç, 2005; Overstreet, & Straquadine, 2002; Sarıçayır, 2010; Tveita, 2008; Tuncel, 2009; Ünüvar, 2007; Yalım, 2003; Yılmaz, 2006; Yılmaz, 2010). Therefore, quasi-experimental design was used without comparison group. Based on these data and since the researcher has only two 6th grade classroom during that semester, the third control group was not added to the design of the study.

Both in layered curriculum and creative drama, individuals locate at centre of the learning, taking in to consideration individual differences of students. Both in two approaches, the basis aim at assessment process is to observe and support individual developments of students. These kind of assessment and evaluation approaches which occurred parallel with education methods to be used as developing high intellectual abilities of students, have great importance (Şahin, & Gök, 2009). When taking in to consideration these similarities, it is thought that the creative drama and layered curriculum methods considered to be an important acquisition for the process. In addition when the primary education programs prepared by Ministry of National Education of Turkey are investigated, although, it was given place to creative drama activities, ,it is remarkable that layered curriculum method which already was present in education literature at the date of program was prepared , weren't given any place in the education program. Thus, it has been thought that layered curriculum method that takes learning life as basis by taking individual differences of the students into consideration and creative drama method that give students opportunity of applying what they learn by doing-living and that makes learning process funnier by developing their creativeness will provide more meaningful and permanence learning for the students. In the studies of Arce, Bodner and Hutchinson (2014) showed that the drama is the one of most effective method which could be used in the classroom. In addition, determining the students' learning styles, adding students as variable to the study and at constructing lesson plans as a guidance increase the importance of this study. .According to Keefe (1979), the learning style is defined as pattern of cognitive, emotional and physiological properties which shows how students perceive, interact with and react to their learning environment. Thus the learning style can be mentioned as a concept which shows trends or preferences for learning. Knowing the learning style of the students provide important contributions in a various extend which starting from the design of the teaching-learning process, up to instructional materials and evaluation forms to be used. In addition, by the identification of variables which affected learning styles, it is possible to control or lead this variables (McCarthy, 1997).

In addition, when the literature was analyzed, there could not be found any research study that compare methods of creative drama and layered curriculum. Also the research studies carried out in the field of Force and Movement, it was stated that it is difficult to learn the principles and the concepts in this unit. Also it was stated in many research studies that anxiety and worries toward the physics lecture in elementary school levels might affect students' success in physics lectures at higher levels (Taber, 2002; Uyanık 2007; Yelken, & Ulusoy, 2013). It is important for the students to concrete the knowledge learned in their mind and to establish relationship with the concepts and principles with their daily life. For all these reasons, when the subject and age group of the study were considered, with the design in which using both quantitative and quality methods together, this study that uses student-centered methods at subjects for which students had difficulty in could be considered as the significance of the study.

Problem Statement

What is the effect of layered curriculum and method and creative drama method on academic achievement and retention of knowledge at ''Force and Motion'' unit within Primary School 6th Class Science and Technology lesson?

Sub Problems

1. Are there any meaningful difference on achievement score average of the groups that layered curriculum and creative drama method were applied at 6th class ''Force and Motion'' unit?
2. Are there any meaningful difference retention score average of the groups that layered curriculum and creative drama method were applied at 6th class ''Force and Motion'' unit?
3. What are the effects of activities based on layered curriculum and creative drama method at ''Force and Motion'' unit on 6th class students' attitudes?
4. What are the opinions of 6th class students on layered curriculum and creative drama method at ''Force and Motion'' unit?

Method

Experimental design of the Reseach

This study is a combined research used qualitative and quantitative together that aims comparing the effect of creative drama method and layered curriculum method on achievement of the students at teaching of the subjects within ''Force and Motion'' unit that takes place within the lesson plan of Primary School 6th Class Science and technology. In this sense, Sequential explanatory design was used as a mixed method strategy in the study. In this design, the researcher giving priority to the quantitative phase of research, qualitative research findings were used as a supporting to explain the quantitative results (Creswell, & Plano Clark; 2014). At the quantitative phase of the study, when the application was applied, because the 6th grade had only two branch office and, comparison and experimental groups were selected randomly, the quasi-experimental design was used. The research carries the feature of being an activity research at the same time because the researcher is also the teacher of the class on which application is done. According to education vocabulary, the activity research; 1 – the systematical research that is used for data collection concerning to own education methods of the teachers, how students learn better and how the measurements are done 2- the researches that aims developing school and classroom based educational applications and generally carried out by the teachers (Demirel, 2005, p.52).

Research design was studied in two dimensions, including quantitative and qualitative. The research design was carried out using quantitative data collection tools in the study are shown in Table 1.

Table 1. Quantitative research design

Group	Pre-Application	Implementation	Post- Application	
	Pre-test	Process	Post-Test	Retention Test
	ST	Creative Drama	ST	ST
I.	SAS	Method	SAS	
	LSI			
	ST	Layered	ST	ST
II.	SAS	Curriculum	SAS	
	LSI	Method		

The research design was carried out using qualitative data collection tools in the study are shown in Table 2.

Table 2. Qualitative research design

Group	Pre-Application	Implementation Process	Post-Application
I.	-	OF LD AP	SSI
II.	-	OF LD AP	SSI

I. Experimental Group
II. Comparison Group

In the research, achievement, attitude and retention levels as dependent variable, while the teaching method is considered as independent variables.

Study Group

Sample of the research were constituted by 44 students who were educated at 6th Class of a primary school in a south district of Antalya. Two experimental groups were used for the study. It

was randomly detected that which method would be applied on which experimental group. The student numbers within both of groups were equal to each other. All the variables except for education method dimension were tried to be equated before application of I. experimental and II. comparison groups. With this aim, possible effects of independent variables that could not be controlled as it may affect validity and creditability of this research on dependent variables (attitude and achievement) were tried to be minimized. Learning styles of 5th Class students in terms of respectively science and technology lesson averages of the students, family opportunities were taken into consideration with aim of comparing in terms of equality in both classroom. It was seen that education statuses of the fathers, their financial opportunities (working room, computer, private teaching institution) and score averages of 5th Class science and technology were equal in the groups. But it was seen that income level of the family was higher at I. experimental group compared to II. comparison group; education statuses of the mothers' were primary school level compared to II. comparison group.

Individual differences carry a great importance in the learning process. Learning ability is different on every individual. While some individuals learn in a short period, some learn late; while some of them forget what they learn in a short time, the others do not forget what they learn in the long term. Therefore learning dimensions of the students in both of the branches were detected by applying learning style inventory to the students.

Data Collection Tool

With the aim of data collection, quantitative science achievement test, attitude scale and learning style scale; and at qualitative dimension, observation form, semi-structured interviews (SSI), student diaries and process assessment were used.

Science Achievement Test (ST): 23 question was used for achievement test to measure achievement of students on "Force and Motion" unit located in the 6th grade science and technology textbooks accordance with the targeted acquisitions. This test was applied three times which are before the application, immediately afterwards the application, 4 weeks after the after the application to both groups. 50 test question, each consisting of four options, was prepared for achievement test to measure achievement of students on "Force and Motion" unit located in the 6th grade science and technology textbooks accordance with the targeted acquisitions. To determine the validity and reliability of the prepared achievement test, a pilot study was administered 117 6th grade students who has been taught "Force and Motion" unit previously at 2009– 2010 school year. The pilot study data was analysed by using SPSS 15 program. The value of KR-20 was analyzed for scale reliability, item discrimination and item difficult indexes was analyzed for item analysis. The reliability of KR-20 value of the test, it was analyzed and found 0.836. Data was analyzed and it was calculated the item-total correlations. The items had values upon than .40 was included to study, 27 question had values below .40 was not included to the study because of not being distinctive. 23 questions achievement test was created. After the questions have been removed, the table of specifications was created and it was observed that there are enough questions in the test to scale each acquisition. Therefore, the validity scope is unaffected. In the results of analysis, the KR-20 reliability value of 23 items was found 0.866 by taking into account the expert opinions. The test application took approximately 30 minutes.

Science Attitude Scale (SAS): With the aim of detecting whether there was a change on the attitudes of students towards science and technology lesson after the application or not, ''Attitude Scale towards Science and Technology Lesson'' that was developed by Nuhoğlu (2008) was used. The scale was applied to 2 experimental group before and after the application. By using totally 20 items which consist of 10 positive, 10 negative items with 3 point likert scale, the primary school students were asked to express their views about science and technology course and activities carried out in this course. Application scale took approximately 15 minutes. When data was analyzed statistically in line with student's answers, the negative statements were recoded and necessary permissions were obtained from developer of the scale.

Learning Style Inventory Towards Primary School Students (LSI): ''Learning Style Inventory towards Primary School Students' 'which has been developed by Guven and Ozbek (2007), before the application, with the aim of researching whether both experimental groups who participated to the research were equal to each other in terms of their learning styles and to be used at the preparation of lesson plan (Appendix 1 and Appendix 2) was applied. The test application took approximately 30 minutes The scale is consist of 4 layers are named as "Entirely appropriate", "Appropriate", "Not appropriate", "Unavailable". The positive expressions were used in the scale considering the thinking level of the students' age group. Factor analysis was conducted to determine the construct validity, Cronbach's alpha reliability co-efficient was equal to 0.78 which was reduced 41 to 27 question inventory following the analysis. Required permissions to use this scale were taken from the researchers who developed the scale.

Semi-Structured Interview Form (SSI): With the aim of supporting the observation findings after the application, voluntary students among both of the groups were negotiated. 9 students from I. experimental group and 7 students from II. comparison group were volunteer for semi-structured interviews (SSI) . The interview form that was configured before the interviews and arranged by the experts' opinions was prepared with interview form. Because of different teaching methods used in two branches, two different interview form has been established, considering the size of each teaching methods, stages and application process. In terms of getting students accustomed to interview process, in both groups, 5 warm-up questions about the school, classroom and lessons and then 4 questions consisting subheadings towards to sub problem of the research within the methods discussed in the classroom were asked. When interview questions was preparing, the attention was paid for asking general questions to specific one, asking knowledge consisting questions not being like in the exam, writing alternative questions for incomprehensible questions, detailing answers for probation questions.

Observation form (OF): An observation form concerning to the aspect to be researched was prepared. This observation was inspected in three dimensions as physical, activity and social. Within the frame of observations that were carried out during the application in each experimental group, necessary notes were taken on the form for each course by the researcher. Also each application was recorded as a video to be able to record the observations during the process. The researcher has generated codes by examining data obtained from observation form and created themes by collecting codes as certain titles. The generated codes explained in themes and descriptive language, the findings were reviewed by the researcher.

Learner Diaries: The students were requested to keep their experiences and opinions as diary during the application along education process. The opinions that were stated at the diaries were used at the part of findings by quoting from the rights. Student diaries, processed and interpreted with qualitative data by using as the document in qualitative part of the study.

Process assessment (PA): Process assessment was used in this study to be able to monitor the interaction occurred within learning environment. In both two groups, within applied methods, students evaluated both themselves and the process. In the experimental group applied creative drama method, students were asked to share their opinions and feelings regarding to the process. These assessments was used in findings by making direct quotations.

Process Steps

Before the application, during two weeks, the courses taught with the creative drama method in I. Experimental group and layered curriculum method in II. comparison group and the lessons were recorded during this process by video camera so that students were getting used to video camera.

Before starting the application, science achievement test and science and technology lesson attitude scale was applied on all groups as a pre-test. While analyzing the applied achievement test and attitude scale with SPSS program, it was inspected that whether there was a difference between

achievement scores and attitudes of the groups or not. After the applications at both of the groups, science achievement test and science and technology lesson attitude scale was applied as post-test. Also science achievement test was reapplied as formative test after 4 weeks of the application. Final test and formative test results belonging to both of the groups were analyzed with the help of SPSS program, whether there was a meaningful difference between achievement scores and their attitudes in terms of science and technology lesson was investigated.

Also while taking the opinions of the students about layered curriculum and creative drama, semi-structured interviews (SSI) among qualitative research designs were carried out with the students. By this way, it was also contributed to creditability of the study by comparing quantitative and qualitative data which collected during the research.

As a result of analysis that were done within SPSS program, it was detected that there was a 0.24 scores meaningful difference (< .05) calculated in favor of I. experimental group between averages of the scores that students also got from visual learning style dimensions. These differences were tried to be controlled statistically. In each two groups which applied creative drama and layered curriculum method, activities were constructed by taking in to consideration these results.

During the process of application of teaching methods, the subjects within the unit of ''Force and Motion'' was given in parallel with the same order separately to I. experimental and II. comparison for four weeks by taking the acquisitions available within the body of Primary School science and Technology lesson education plan. The subjects was given to I. experimental group by using the prepared lesson plans and materials with creative drama method and was given to II. comparison group by using the prepared step tasks prepared with layered curriculum method. In both groups, the courses were taught without interruption, student were asked not have a break, to provide focusing of student and achieving the integrity of the process.

In the group on which creative drama was applied, with the aim of constituting group dynamic and providing body preparation during the beginning part of the course, warm up studies were done. In the warm-up studies, the plays and small roles that were prepared in accordance with acquisitions and learning style of inventory data which were applied to students before, were constructed. Then improvisations, playing roles and other activities were carried out to get benefit within the frame of the subjects to be improvised. Sometimes the students start out with a picture at the improvisation step and sometimes they set out via a word or from an event and then various stories and poems were constituted and these stories and poems were animated. At the end of the lesson, share of the acquisitions, emotions and opinions obtained within this process were provided. With the aim of detecting whether the targets aimed after the activities were reached or not and detecting the awareness of the students, techniques such as short responses and brain storming were get benefit.

In the group layered curriculum method was applied, program activities constituted from C, B and A steps prepared in accordance with learning style inventory data, education program, unit and distributed to the students before the application. The tasks which includes knowledge and comprehension in C layer; application in B layer; analysis, synthesis and evaluation levels in A layer were constructed. The students were free to choose unlisted tasks which they could select their own. First two events of layer C which is the first step, specified as mandatory task. Providing students with general information about the unit, to provide preparing a substructure of tasks to be done in the future, all students were requested to conduct activities themselves. Except for the first two events, Scores of tasks in Step C is designated as 5. The reason for keeping scores low is to provide taking more tasks for students because of comprehensive unit. Students reached the goal score 65-70 totally by doing the tasks which they have chosen from the C stage, were asked to switch to tasks of layer B. The score for the 6 tasks in Step B is designated as 15.The students were stated to have 1 task as an obligation and were requested to pass layer A, the students scored 15 completing the task were asked to switch to layer A. The score for the 4 tasks in Step A is designated as 15. In this layer the students,

who scored 15 by completing the tasks, are considered as successful. The students had problems completing the tasks during the application in the classroom are provided flexibility to complete their tasks at home.

The students completing the tasks on each step presented the activities in the direction of the criteria previously given to the students. After getting questions and opinions of the students concerning to the activity, the students' self-scoring themselves were requested. Then teacher made scoring for each student. Two computers, various science and technology books were brought to the classroom for the students' getting benefit within this process. The students'' getting copy of the parts from the resources that students feel need was provided and the students were made presentation after detecting date and time of the presentations for the students who were willing to learn the subjects by listening from the students.

In Layered curriculum method to the students at II. comparison group; semi-structured interviews were carried out with the volunteer students with the aim of taking the opinions of I. experimental group students about information and skills obtained after post application step and application of the education with creative drama method. These obtained data were then analysed with qualitative analyses methods.

The content analysis in this research was collected in two steps as the data obtained during application process and the data obtained after application. For example; the data collected during education activities was analyzed regularly. The data collected after education activities were subjected to content analysis and relation and coherence of the data collected during all this research was examined.

Analysis of Data

The quantitative data analyzed with SPSS program. In these analyses, primarily, descriptive statistics (frequency, percentage, mean, standard deviation) was calculated in order for putting forth the properties of distribution, assumptions of statistical methods which were tested. Depending on the research problem, whether mean differences is significant or not, was determined with t-test for independent groups, between experimental and comparison group on achievement and pre-tests of attitude. According to pre-test results of experimental and comparison groups, meaningful difference between mean scores of the groups was corrected by using covariance analysis technique (Büyüköztürk, 2007). ANOVA for repeated results carried out with the aim of researching the effects of creative drama and layered curriculum methods applied to I. experiment and II. comparison groups on retention of knowledge.

For qualitative analysis of the data and the interpretation, "content analysis" was used. The basis aim of content analysis is to achieve data concepts and relationships. For this purpose, the data collected were conceptualized, then according to emerged concepts, it is tried to be organized in a logical way and accordingly it was determined the themes which explains data (Yıldırım, & Şimşek, 2011, p. 227).

Results

Comparison of the Groups before Experimental Procedure

Two different approaches were used together at the patterning of the research. Before starting the application, achievement test and attitude test for which validity and reliability were tested applied to I. experimental and II. comparison groups. The pre-test scores in which I. experiment and II. comparison groups gained from achievement test were given below in Table 3.

Table 3. The Pre-Test Scores I. Experiment and II. Comparison Groups Gained from Achievement Test

Group	N	$\overline{X}$	ss	p
I	22	5.32	3.22	.749
II	22	5.59	2.30	

According to pre-test results obtained from achievement test on the classes for which layered curriculum and creative drama methods were applied; the levels of I. experimental and II. comparison group students are closed to each other. Also when the p values are taken into hand, it can be stated that there is no a meaningful difference between achievement of both groups (p>.05) and groups are equal to each other.

Pre-test scores that I. experiment and II. comparison groups gained from attitude scale are given at Table 4.

Table 4. Pre-test Scores I. Experiment and II. Comparison Groups Gain from Attitude Scale

Group	N	$\overline{X}$	SS	F	p
I	22	56.09	3.22	4.043	.051
II	22	50.81	3.42		

It has been seen that pre-test common effect of the group on attitude scale average was meaningless according to Table 4 (F(1.40) = 4.043; p>0.05). Both of the groups were equal to each other.

The data obtained from learning style inventory applied to I. experimental and II. comparison groups was given at Table 5.

Table 5. The Data Obtained from Learning Style Inventory Applied to I. Experimental and II. Comparison Groups

Style Dimension	Ranch	N	$\overline{X}$	S	Sd	t	p
Sense-Kinetics	6A	22	2.96	0.124	42	1.572	.05
	6B	22	2.76				
Auditory	6A	22	3.06	0.713	42	0.370	.05
	6B	22	3.00				
Visual	6A	22	3.30	0.023	42	2.367	.05
	6B	22	3.06				

When Table 5 is examined, it is obvious that learning style scales of A and B branches had the highest score average (6A = 3.30; 6B = 3.06) on visual learning dimension, auditory learning style dimension scores (6A = 3.06; 6B = 3.00) were at the second score and sense-kinetic learning style scores (6A = 2.96; 6B = 2.76) were at the last level. When it was examined that whether the scores of the students obtained from learning style scale relevant parts in terms of branch variable showed difference or not, it was stated that there was a 0.24 scores meaningful difference (< .05) calculated in favor of 6A branches between averages of the students' scores only obtained from learning style dimension.

Comparison of the Groups After Experimental Procedure

The Findings Related to First Sub Problem

Primarily , to obtain evidence for this sub-problems, the linearity of the relation pre-test and post-test variable (Figure 1) of the students in experimental and comparison groups, homogeneity of the variables and homogeneity of the regression linearity is proved (Table 6).

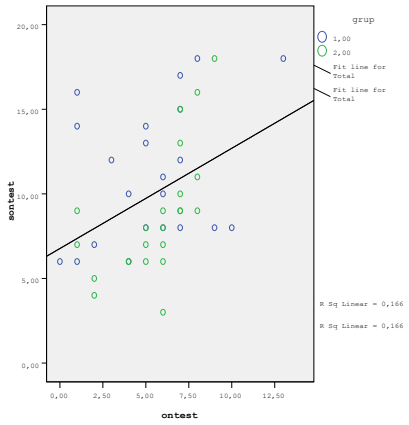

Figure 1. Linearity of relation between pre-test and post-test variable

It can be said that there is a relation at the level of r=0.166 between pre-test and post-test variables and this relation is linear by examining the distribution diagram. The points that show the values of the groups concerning to both variables are collected around a linear.

Table 6. Homogeneity test of variables

F	sd1	sd2	p
3.202	1	42	.081

The homogeneity of variants is showed in accordance with Table 6 (p> 0.05). In Table 7, average of post-test achievement scores of the students in experimental and comparison groups and post-test scores and pre-test scores according to Winsorized mean are tabulated.

Tablo 7. Descriptive Statistics Achievement Test Scores According to Groups

Grup	N	$\overline{X}$	Winsorized mean
I.	22	11.13	11.19
II.	22	8.86	8.72

According to Table 7, winsorized mean of achievement test scores for first group is 11.19 and for second group. To determine whether these differences between winsorized achievement scores of the groups is significant or not, covariance analysis were carried out, and the results were presented in Table 8.

Table 8. Covariance Analysis Results According to Winsorized Achievement Scores of Groups

Source of Variance	Sum of Squares	sd	Mean Square	F	P
Group	65.943	1	65.943	5.384	.026
Pre-test	149.744	1	149.744	12.227	.001
Group	26.691	1	26.691	2.179	.048
Error	489.873	40	12.247		
Total	732.251	43			

According to Table 8, it can be concluded that groups pre-test common effect scores was meaningless over achievement test average F(1.40)=5.384; p<0.05. The academic achievement of students have differences according to education method. According to these results, it was seen that the creative drama method had more effect on achievement compared with layered curriculum method.

The Results Related to Second Sub Problem

It is aimed to make comparison between the groups by determining retention of knowledge which is a important indicator of determining the sub problem of this research and effectiveness of learning process. The data obtained from pre-test, post-test and retention test results of the groups on which creative drama and layered curriculum methods were applied is given at Table 9.

Table 9. Science Achievement Test Average and Standard Deviation Values

GROUP	Pre-Test			Final-Test			Formative Test		
	N	$\overline{X}$	ss	N	$\overline{X}$	S	N	$\overline{X}$	ss
Creative Method	22	5.32	3.22	22	11.13	4.00	22	11.59	4.43
Layered curriculum Method	22	5.59	2.30	22	8.86	3.80	22	9.90	4.17

According to Table 9, it has been seen that average achievement score of the group on which creative drama method was used before the application was 5.32 and average achievement score of the group was 11.13. It has been seen that when it was applied for retention after the application, the average achievement score was 11.59. Same average scores of the group on which layered curriculum method was used respectively 5.59; 8.86 and 9.90. In accordance with that, there was an increase at achievement levels of the students on which both on which layered curriculum method was applied and on which creative drama method was used. Also the retention score values were closed to post-test scores. ANOVA results carried out with the aim of researching the effects of creative drama and layered curriculum methods applied to I. experiment and II. comparison groups on retention is given at Table 10.

Table 10. ANOVA Results of Science Achievement Test Pre-Test, Final-Test And Formative-Test Scores

Source of Variance	Sum of Squares	sd	Mean Square	F	p
Between-Subject (C.D/L.C)	1183.053 49.705	43	49.705	1.842	.182
Error	1133.348	42	26.984		
Intra-Subjects Measurement (pre-final, monitoring test)	1378.667 722.561	2	361.280	49.181	.000
Group* Measurement	39.045	2	19.523	2.658	.076*
Error	617.061	84	7.346		
Total	2561.72	131			

*p>.05

According to Table 10, it has been concluded that there was no meaningful difference between achievement score average of the groups on which two different methods were applied as before and after application. In other words, creative drama and layered curriculum method had same effects on increase of achievement test scores. F(2.84)= 2.658, p>.000. In accordance with that creative drama and layered curriculum methods are equal to each other in terms of increasing achievement scores. When main effect tests of the groups and measurement is examined, there was no meaningful difference between point average scores obtained from pre-test, post-test and retention test scores of the students on which creative drama and layered curriculum methods were applied . F(1.42) = 1.842; p>.001

The Findings Related to Third Sub Problem

To obtain results about this sub problem , post-test average of the students in experimental and comparison groups and post-test scores and pre-test scores according to Winsorized mean are shown in Table 11.

Table 11. Descriptive Statistics of Attitude Test Scores According to Groups

Group	N	$\overline{X}$	Winsorized mean
1	22	56.36	54.37
2	22	54.27	54.87

1. The class on which creative drama was applied
2. The class on which layered curriculum was applied

When Table 11 is examined, winsorized mean attitude scores is 54.87 for 2. Group and 54.37 for the 1. Group. It is seen that there was a difference between improved achievement scores of the groups. With the aim of detecting whether this difference is meaningful or not, Table 12 is to be examined.

Table 12. ANCOVA Results Winsorized Attitude Scale Scores According to Group

Source of Variance	Sum of squares	sd	Mean Square	F	P
Group	51.429	2	51.429	3.940	.054
Pre-attidute	183.250	1	183.250	14.038	.001
Group*pre-test	52.778	1	52.778	4.043	.051
Error	522.162	40	13.054		
Total	809.614	44			

According to ANCOVA results of Table 12, improved post-test scores of groups were meaningful at the level of .01 compared to pre-test scores (F(1.40) = 4.04; p>,05). The attitudes of the students do not show difference according to education method. According to these results, the effect of creative drama method applied to I. experimental group and layered curriculum method applied to II. comparison group, on attitudes of the students towards science and technology lesson was equal. It was concluded that both of experimental group hadn't any significant effect on the students attitude towards Science and Technology course. However, attitude scale of experimental groups had not any statistically significant increase towards to science and technology course, according to interviews, conversations with students and students'' diaries it was determined that there was an increase interest of students on attitude towards to the science and technology course. Below, Some of the attitudes towards science and technology courses, thoughts, ideas and opinions which were obtained from students 'diaries, interviews and assessments on a number of activities in the classroom are presented. Some of the views in the experimental group creative drama method is applied as follows:

- "I learned a lot of things in creative drama. I learned dynamometer and the gravity. I develop my manual dexterity. Group work was better. We had so much fun. I liked working with my friend, because my friend helps me if I can't do anything and I help him. We always got along well in this course, we have always been close. "
- "Now the lessons are more fun. Both we fun, and learn. I realized that everything we learn with drama was already in our life."
- "Lesson with creative drama is better because we are more active in lesson. Because we always did it by showing. Creative drama is better because I can understand better when I show it."
- "I was happy and I was excited. It was enjoyable because I like the unit of "Force and Motion". I was excited in some issues because I was learning new things. We have been

taught better. Some people learn better by drawing-typing but I understood better with playing, so, with creative drama, it was enjoyable for me."

- "It affected my learning. I understood better with animations in this course. My acting talent was developed, we all did animations, I perform Newton, I already love science, I love science more now. "

Some of the views in the experimental group layered curriculum methods is applied as follows;

- "We proceed level by level. Firstly we did easy tasks but then they become hard by the time. Activities were good. It is better to choose our own activity. Sometimes we did with group sometimes we did ourselves. "
- "Previously there were not much activity but in layered curriculum there was always activity. There were different activities. Everybody chose what they want and did it. It was much enjoyful, I didn't understand time passed during lesson."
- "The lessons were enjoyful. It was enjoyful to watch our activities of our friends and at the same time we learned new things. At the school or other places much things is learned by seeing. These visuals are still in our minds and are persistence. We learn much things because of doing ourselves and seeing."
- "I am much closer to the science now but I have already loved science. It was a little contribution to the development of my skills. For example, my painting skills improved. I didn't like much, I could not do it but I tried. It helps me to think more. My ability to write poetry is developed. I could never write any poetry before but now I think that I can write better. Fortunately, we've applied this method"
- "I am much closer to the science now. I pay attention to my speech when I was presenting. I thought more when I was working for tasks. I understood lessons better. I remember everything that I did because I did them myself."

The common feature of almost all of the comments received from students could be mentioned as; the lessons are more pleasure, enjoyable, easier to learn and learn in different ways (listening to the music, drama playing, painting, project designing etc.).

The Findings Related to Fourth Sub Problem

The problem stated as ''What are opinions of 6th Class students concerning to layered curriculum and creative drama method within ''Force and Motion'' unit?'' was tested with the analysis obtained from qualitative data collection tools. The thematic codes obtained in the direction of the findings obtained within the scope of research are stated below. These codes were constituted by the observation forms that researcher used within the processes, process assessments that students made at the end of each lesson, student diaries and semi-structured interviews that researcher made with the students constituted the analysis.

Table 13. Thematic Codes Obtained From Analysis of I. Experimental Group Data Collection Tools

Individual Acquisitions	**Acquisitions Towards Lesson**	**Environment Conditions**	**Process**	**Sense-opinions**	**Efficiency Choosing Criteria**	**Effect on Learning**
- The effective use of body language -İncrease in skill - The development of thought -The development of imagination - Memory development - Self-confidence -Expression - Self-recognition - Acting ability -Sense of Responsibility -Creativity	- Increased achievement -Knowledge Acquisition - Wanting drama activities to be continued - Loving the lesson more - Increase of interest -Being eager - Easy to understand	- Smallness of the class - Noise	- Idea development -Reviving a better understanding - Preparation warm up - Voluntary participate activities - Showing effort - Establishing relationship with life - Leadership - Learning by doing	- Being funny - Fine - Excitement - Enjoyment - Happiness - Curiosity - Getting surprised - Bored, - Being nervous - Being shy - Fear of making wrong - Strain -Enjoying	-Rapprochement in friendship relations - Coexistence - Group - Cooperation - Share -Compatibility - Productivity - Solidarity	- Facilitating understanding - Easy to learn - Willingness to learn - Learning style -Consolidation

According to the thematic codes given in Table 13, I. experimental group students stated that they liked about creative drama method and the lessons were more joyful with this method and thanks to this method they learned more. They mentioned that by making a relation with lesson subjects and daily life within cooperation with friends, more permanent learning was provided. They also stated that sharing and cooperation was increased with group studies, more creative products were occurred and they lived a more efficient process, thanks to creative drama they know more about themselves, explored and developed their skills and their interests to the lesson were increased.

Elif stated creative drama as below in her diary.

"This method was so pleasant. I want this method to be used continuously and never finished. The characteristics of this method that I most liked about were giving the lesson with the plays and thanks to this method we learned so much information. My knowledge and skills were increased. I became creative and started to think about more. I learned so much thanks to creative drama. I had not self-confidence and started to feel self-confidence. I felt so nice feelings and I felt myself so excited."

Zeynep wrote the below in her diary concerning to continuance of creative drama.

"I better understand the lesson with creative drama. We made improvisations regarding to the subject. By this way, I remember the learned ones even one week passed. We made exercises with music. Creative drama is so joyful. It both entertains us and teaches us. It leaves permanent effects in our brain. It prevents getting bored from the lesson. Makes you entertain even in the lesson that you do not like most and provides participating the lesson. I wish it would have been used along the end of the school and even it would have started from sixth class to eighth class. Even we can take our lunch here. We have four hours lesson per week and I want these lessons being the last two lesson and taking long.''

Table 14. Thematic Codes Obtained From Analysis of II. Comparison group Data Collection Tools

Individual Acquisitions	Acquisitions Towards Lesson	Environment Conditions	Process	Sense-opinions	Efficiency Choosing Criteria	Effect on Learning
-Skills development -Thinking power -Showing effort -The development of imagination -Self-confidence -Self-recognition -Self-regarding -Personal development -Expression -Objective perspective -Self-assessment -Creativeness	-Achievement increase -Data recovery - Progress in the lesson -Interest increase to lesson -Continuity	- Noise -Number of Students - Cluster scheme	-Research -Individuality -Listen to each other -Making criticism -Group work Progress from easy to difficult -Scoring criteria -Exclusion -Responsibility -Assistance - Inability to evaluate the time	-Having Fun -Liking -Getting excited -Being pleasant -Fear -Happiness -Crusity -Joy -Being shy -Getting tired -Strain	-Individual /group work -Unity -Ease / difficulty -Materials -Learning style	-Data recovery -Work to increase request -Visual learning facilitation with -Easy to understand -Easy to learn -Persistence -Learning by doing

According to the thematic codes given in Table 14, II. comparison group students stated that they liked about layered curriculum method and the lessons were more joyful with this method and thanks to this method they learned more and the process was more efficient as they progress step by step from the easy one to the hard one during the activities. As they made individual decisions along the application and they were active within the process, the information was permanent and they also stated their complaints about the noise and the crowd of the class within the process.

It has been seen that the students paid attention on easiness-hardness degrees, whether the materials necessary in the activity were supplied or not and whether they liked about the activity or not. The researcher took the below notes on the observation form.

> *"The students take their skills and enjoyments while choosing their activities. Mustafa stated that he likes about drawing to his friends and therefore he will take visual tasks. Melike prefers participating to group studies. She does not like about group studies and she thinks that enough responsibility awareness does not develop on her friends. As she better understands by writing and express herself better, she chooses activities such as poems and compositions. ''*

Beyza explained her excitement during the presentation as below.

> *"I was so worried today. Because my duty that I chose was poem and I was going to read poem near my teacher and I started to read. I started to flattered while I was reading and I felt so shy while reading. Because I flattered and I flattered when somebody read something to me as I felt excited. The people may think that this child does not know reading but I do not want to get excited.''*

> *"There was a presentation today again and at the beginning I found it hard. Because I was excited and I faltered. Maybe I did not say some letters. But then, I overcame my excitement and I felt so happy.*

Validity and Reliability of the Study

In this study as both qualitative and quantitative methods were used, the threats that may affect the result of the reliability and validity of the study including how they were controlled by the researchers were mentioned respectively for both quantitative and qualitative part. Since there was no control group and the study was conducted by one experimental and a comparison group, the

threats that may affect the internal validity were considered more seriously. At the beginning subject characteristics were defined in detail and tried to be controlled as independent variables (Science achievement pre-tests, average scores of the students from 5th grade science lessons, family properties and learning styles of the students). Also study groups were assigned randomly to the teaching methods. Besides during the preparation and the application of data collection tools, the threats were tried to be controlled. For example, during the application of the tests, students completed all the test in a comfortable environment and for them not to be bored, the tests were given at different days. Morever, the mortality threat was controlled by informing students' about the application of the tests and announcing the test administrations a few times before application. By this way, all of the students came to the classroom during test applications.

Fraenkel, Wallen and Hyun, (2000) suggested that the matching only pretest posttest group design provides control in somehow on subject characteristics, mortality, instrument decay, testing, history, maturation, and regression threats but it has a generally weak control on location, data collector characteristics, data collector bias, attitudinal and implementation threats. Since control group without any special application was not included in this study, the researcher tried to take more caution against these threats especially for internal validity. Implementation threat was controlled in this study by assigning the same teacher to all groups in each school. During the analysis of data collection instruments, the same situations were considers and the analysis were carried out in calm and relaxed environments and all the analysis were carried out seperately by the researchers and the results were compared. For internal validity, also the research questions were designed to support each other and the analysis and results were presented by mixing the results of qualitative and quantitative parts of the study. In fact, one of the researcher of the study to become the classroom teacher of both group can be considered to increase the internal validity of the study (Fraenkel, Wallen, & Hyun, 2012). By this way, the risks might have been reduced which may arise because of changing the classroom teacher or using a different teaching methods in the classroom (Hawthorne effect). In this study the researcher was the teacher of both experimental and comparison group and being aware of the threats, she tried to be the usual teacher of her classroom by taking her voice or her behaviours into consideration. Also the effect of Henry was reduced with the absence of a control group to the design of the study. This study include an experimental and a comparison group otherwise threat might arise since experimental groups may perform better because of the novelty of the treatment rather than because of specific nature of the treatment or control group students might become resentful and hence perform more poorly than the treatment. Since this study had two experimental group, these effects were controlled by the nature of the research design. Related to external validity of the research, all information related to research design, study group, data collection instruments, data analysis and interpretation tried to be explained in detail. Also the researchers of the study and all raw data of the study might easily be reached which is also important for external validity of the study. In addition, in order to ensure the validity and reliability in qualitative dimension of the research, the features of the research which are "credibility, transferability, consistency and availability of confirmation" (Yıldırım, & Şimşek, 2008, p.265) has been noted. On the credibility, it has been benefited from observation forms, semi-structured interviews (SSI), students' diaries and the process evaluation for data diversification. Describing the data detailed, it is provided the transferability by making direct quotations at descriptions.

In the process of the analysis, collection and reporting of data, by processing similarly the questions directed to the students in the interviews with fidelity on the both groups, observation data and interviews recorded by video, so consistency is ensured. In addition, in the scope of consistency, using various data tools, data were collected at different period of time which are named as pre-application, application process, post application. The observation forms were regularly in the lessons filled by the researcher. Furthermore, because, the students were accustomed to video camera and different teaching methods like creative drama and the practice teacher was the class teacher, during the study, it could be said that the Hawthorne effect was checked. To check this effect, students was not told to be participated in a experimental process. Otherwise, the curriculum activities were

applied parallel on both of the classes and the curriculum was followed. At the break times and at the end of the lessons, opinions and feelings concerning to the lesson was taken. Interviews were done with the volunteer students after the application. These data were save on the computer and analyzed by using content analysis technique. The results were supported with data obtained during the application process, and the availability of confirmation was provided by making no interpretation and direct quote.

The formula recommended by Miles and Huberman (1994) was used at the calculation of creditability of the codings done by the researcher who is expert on science and another researcher with the aim of calculation qualitative data analysis creditability in the research and creditability of the research in the group on which creative drama method was applied as calculated as 88.6% and creditability of the research in the group on which layered curriculum method was applied as calculated as 90.1%. Within this direction, the interrater reliability coefficient average between the coders were calculated as 89.4% using the formula "Interrater reliability = (Consensus / Consensus + Dissensus) x 100".

Discussion, Conclusion and Suggestions

The achievement levels of the students were increased at both of the applied methods. But according to test results, the final test achievement scores were founded as meaningful in the support of I. experimental group. In accordance that, it was concluded that creative drama method applied on I. experimental group was more efficient on achievement increase compared to layered curriculum method applied on II. comparison group.

Both of these methods applied in the research was student oriented. The students in both of the groups stating that they learned the subjects within the process of the application easier and the things that they learned via this method were more permanent stated that they learned by doing-living. Although the reason of why creative drama method is more effective in increasing the achievement compared to layered curriculum method as below. The responsibility conscious of the students participated to the application from 6/A and 6/B branches had not been developed so much as their teachers at I. stage continuously changed. While it is required that the students had to regularly carry out and present tasks that they took at layered curriculum method, some of the students did not carry out their tasks on time as stated on the quotation part. Even though they were warned by the teacher, they continued these behaviours for a few times. This situation may negatively affect other students at the operation of the application. So may activities were given in accordance with different learning styles of the students with the aim of having a general information on the unit at C layer. The students were requested to choose total twelve tasks as being two compulsory tasks at this step. As the task numbers are high, this may forced the students and may negatively affect them.

In the classes that the lesson was taught with creative drama and layered curriculum method, it has been seen that there was no significant difference between total score average of the students gained from retention test. Both of the methods were effective on permanent learning of the students and there was no difference between retention of the learned information. The results of this research is, coincide with the result of layered curriculum program providing the retention which located the at end of the "Effect Of using a layered curriculum format of ınstruction ın a high school environmental science energy Unit" research by LaSovage (2006) and coincide with the results of Ødegaard and Kyle (2000) which investigates how to use the drama in order to enhance learning in science education; develop retention, reflection and creativity are important in students' life. As a result, the abilities of reflection, creativity and permanent learning was considerably increased.

Whereas there is a no statistical increase on the attitude scales applied to I. experiment and II. Comparison groups, the interest of the students to science and technology lesson with creative drama method and layered curriculum method is an increased. The reason of why there was no statistically meaningful difference on attitude scales before application even though these changes were observed with the students can be explained as like this: the attitudes of the students to science

and technology lesson being high before the application, sampling number of the scale being less, sampling being constituted from three categories and its application duration. It is thought that more creditable results may be obtained if the number of the students were higher, it was applied for a longer period instead of 4 weeks and if the scale was 5 likert type scale. While the results of this research coincide with the result of layered curriculum program having no statistically significant difference on attitude towards science and technology course as found in Demirel et al.(2006) and Yılmaz (2010), do not coincide with the creative drama method results of studies prepared by Üstündağ (1997), Karadağ (2005) ve Başkan (2006), contributing to attitude towards science and technology course of students.

In accordance with the data obtained from science diaries and interviews done with the students, it has been seen that the students realized their skills within individual acquisitions and developed their abilities. The students whose acting ability were developed during the improvisations done in the classroom creative drama was applied started to use their body language more effectively and better articulate. The results of this research is coincide with the result of creative drama method having important role for students to express themselves at the end of the research by Heinig (1981) and coincide with the results of creative drama gaining students to self-confidence which located at the of the research by Muller (1997). In the same way, it is seen that self-confidence of the students is increased due to presentation of the students concerning to done activities that was applied in the class layered curriculum method was applied and they stated that they cared about themselves more. Thanks to presentations, it is seen that the students used their body languages better and articulated themselves better. As the methods applied on both of the groups make process more active within the process, it made contributed to the individual development of the students by providing an increase on self-confidence of the students.

In the layered curriculum method, the students paid attention on learning styles, being in accordance with their skills and pleasures, easiness of the homework and accessibility of the materials to be used at the stage of the application while choosing these activities. The criticisms done after the presentation stage by the classroom were founded as constructive but the students' being so positive in assessment of the students at the beginning of the application was drawn attention of the researcher. The students stated that they found nor missing part in so many studies even thought there was so missing parts. The standard of all these activities may be found as high by the students as the students had not used these kinds of activities so much. As attentive and comprehensive homework were done in future, the students assessed presented activities more realistic and objective.

The classroom environment was arranged in accordance with the applied methods in I. experimental and II. comparison groups. In the classroom layered curriculum program was applied, cluster arrangement was used with the aim of the students carrying out the activities easily and facilitating the group studies. The students who had not given lesson with this arrangement stated that they were satisfied about the classroom order. The students who complained about the noise occurred during arrangement of classroom order stated that the processes would be faster if the classroom size was smaller. In the classroom creative drama method was applied, the students continuously stated that the classroom was small. The smallness of the classroom affected the activity during the activities. Because of the nature of both teaching method used in this study, group studies were given more importance during the application. Noise occurred during these studies. Some students complained about this situation. The effects of these kind of situations which were the mostly the results of using different teaching methods in the classroom might be reduced to minimum by decreasing the number of students in the classrooms, the use of classroom which are big and suitable for any kind of design for sitting, the use of different method in different lessons so that students become familiar with them, to educate teachers in terms of being open to new situations, giving clear instructions, having strong classroom management and giving opportunities for students to express themselves.

Some of the students stated that they feel fear in terms of not being able to learn science and technology lesson with creative method but when the application continued, they got accustomed to the method and their willing to learning was increased with this method. Similarly; some students stated that they feel fear, find difficult to do selected activities in the classroom applied layered curriculum method. It has seen that some students exited during the presentation, but, when the application continued, they controlled their excitement, expressed themselves better. The results of this research is coincide with the result of students expressing positive opinions about creative drama and layered curriculum method located in Kırmızı Susar (2007), Demirel et al., (2006) and Yılmaz (2010).

In this study, creative drama and layered curriculum methods was used as independently a direct instructional approach. The researches could be carry out that supports these methods with different learning approaches such as multiple intelligences theory, problem-based learning, such as inquiry-based learning. The views of student and teachers about realization stage of the teaching level and creative drama or layered curriculum methods, could be determined via these two methods. The existing primary school managers and teachers of science and technology could be investigated how they are equipped about these two method. Guidebooks could be prepared for teachers about creative drama and layered curriculum method to be used in education

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Appendix 1.

Creative Drama Lesson Plan

Lesson: Science and Technology

Class: 6/A

Unit: Force and Motion

Subject: Speed in our Life

Duration: 40+40

Students Acquisitions:

1. The students as relevant to a substance moving a constant speed during a line;

1.3. Expresses and uses speed units (BSB-24).

1.6. Realizes that dynamic objects have motion energy (BSB-1,3,8).

Creative Drama Acquisitions:

- Ability to communicate with a group.
- Being able concentrate his/her attention on person, object, status, etc.
- Being able to make a relation with individual features and sense studies.
- Being able to interpret the relation with creative drama play.
- Expressing the features of playing role.
- Putting oneself in another's place.
- Commitment to using creative drama on solving daily problems.
- Being able to criticize creative drama education program in terms targets, content, operation and assessment.

Key Aspects: Speed, motion energy

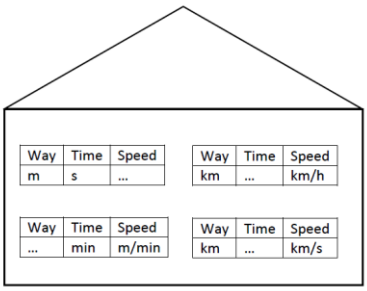
Learning – Teaching Method and Techniques: Creative Drama, playing role, question-answer, problem solving, cooperative learning

1. Warm up and Relaxation Studies:

1. The students walk with instructions of the teachers. ''Walk freely. Think about the streets and moving creatures. Look from the window. What you see? Is there creatures moving slowly, can you see? What about the ones moving fast? Now a snail. Do you know the speed of the snail? Please move as a snail 0,05 km/h. You go out from the house and you are going to the school while you are talking with your friends. The speed of a walking person is 5 km/h. You are in a bicycle competition. You are fast pedaling. Your speed is approximately 50 km/h. You are connected to a sail that is sailing in deep waters. Have you ever heard about this fish? You are swimming in the water fast and your speed is 110km/h. You are an eagle flying in the sky. You opened your wings freely and flying. Your speed is 320 km/h. You are a space shuttle. The researches will be sent to the space for new inventions. The spce shuttle is ready and the last 3 seconds. 3, 2, 1. Your speed is 30.000 km/h. You are a light. You are alight that expanding from the sun to our world. Your speed is 1.080.000.000 km/h. You are so fast that you are able to complete this way in 8 minutes''.

2. Rol Playing - Improvisation:

2. Unit houses are distributed to the students. The one who will first fill the gaps will be elected as the winner.



3. A huddle is gone into. Stories are read to the students: ''The old fishermen was not aware of that he moved far away from the shore while catching fish with his boat. The rain started, a sudden wind was broken out and his boat was capsized. Three opinions were come into his mind to survive from there. The first one was making kite and flying it to be able to make these ships' seeing him. The other one was putting a letter into a bottle and leaving it into the sea and waiting for someone seeing this letter. The other one was making a raft and setting it on the sail''. The relevant question is asked: How this energy necessary for this old fisherman putting these solutions into action could be founded? After receiving the answers, the students constituting quad groups are requested and their animating these by making samplings for motion energy from daily life is requested.

3. Assessment:

4 different groups are constituted. Within the subjects that each group learn today and yesterday, constituting a booklet under the tile of ''The Speed in Our Life'' is requested.

Feelings and opinions of the students are taken by asking them what they feel during the lesson is given with creative drama and what they understand. Then the subject is reinforced by asking the students below mentioned questions.

- What can be speed units?
- What kind of information we need to be able to calculate the speed?
- It was requested that they constitute their own speed list as an homework by researching the speeds of the livings that they will observe around them.

Appendix 2.

Activities of Layered curriculum Program

- Activity Plan of C Layer

The teacher making an introduction to the unit, introducing the main aspects to be learned in the unit and students' taking notes are requested.

1. Reading the explanations at the end of the course book unit and answering assessment questions at the end of the unit.

2. Doing the activities in the workbook and analyzing these in the classroom.

3. Bringing the pictures concerning to the aspects such as speed, force, motion and weight to the classroom after examining the course book.

4. Making resource scanning concerning to force and motion and preparing a brochure within the frame of the information in the course book.

5. By observing the creatures moving around us, searching about their speed and constituting a speed list for these.

6. Searching speed, way and time units and detecting which units are used at which situations.

7. Writing five problems explaining the relation of speed, way and time and solving the problems.

8. Constituting and animating a story that includes the relation of speed, way and time.

9. Designing a play that will be used for explain component force.

10. Preparing a puzzle by starting our from speed and motion energy.

11. Giving 5 examples for balanced and unbalanced forces taking place in the newspaper or journal published currently.

12. Writing a poem regarding to the speed in your life.

13. Detecting 3 problems relevant to speed. Interpreting these problems by drawing speed-time graphics.

14. By finding a event that will be an example for balanced and unbalanced forces, animate these events.

15. By getting benefit from the story under the name of ''Yellow Ox'' in your book, constitute a story including force directions and types.

16. Writing a summary verse by using the ascepts found as important as relevant to force and motion unit and making a song by this verse.

17. Finding 3 events from daily life that shows direction of the forces and component force and drawing it as a caricature on the cartoon.

18. Scamming gravity from resources and preparing a power poiğnt presentation.

19. Preparing a banner after searching gravity.

20. Establishing machinery proving the gravity and showing direction of the gravity.

21. Preparing a poster showing the relation of the force of mass gravity with other sky objects.

22. Searching the masses of different planets and their gravity applied on the objects and calculating their weights on these planets.

23. By searching the concepts of weight and mass, constitute a table expressing this with different examples.

24. Making caricature expressing the gravity and harnesses in the absence of gravity.

25. Preparing a poster regarding to mass gravity.

26. Constituting an acrostic concerning to component gravity.

27. Searching about the life of Isaac Newton and making a relation with the unit and preparing a poster.

28. Designing an experiment providing the hypothesis of ''Moving objects has an energy or not?''.

29. Preparing the concept map of the concepts relevant to force and motion unit.

30. You are a squirrel living in the space. Writing a postcard with these squirrels. The content of the postcard should be the advantages and disadvantages that gravity provides in the space.

- B Layer Activity Plan

1.You are a famous scientist. You are requested to write a composition constituted from at least 300 words about mass gravity. While writing the composition, it is expected that you compare the other sky objects with the world and pay attention including mass and weight relations. **Please use composition writing directive.**
2.You are an astronaut who is devoted his/her life to the science. You are willing to research the effect of gravity. You are preparing for going to Moon from World. You have taken 1 kg bottle with you for this research and you are ready for the trip. You are keeping the records of your observation on mass and weight of the bottle and net force affecting the bottle. You are also keeping the records of the information concerning to gravity affecting the bottle. While keeping the weight of the bottle, what kind of a tool you have used and what kind of changes you have observed on the tools that you have used within this process. You support all your observations with drawings and notes during this journey. A reporter from a famous science journal requests you to make an interview with you for sharing this process after the journey. **Please use directive preparation directive.**
3.Constitue a concept map relevant to force and motion unit. Detect the main concepts that you will use in concept map. Use speed, force and motion concepts in your concept map and state the connections showing the relations with each other. **Please use concept preparation map directive.**
4. You are a science and technology teacher. The unit that you will tell your students is force and motion. You want to prepare an instructive, entertaining and thought-provoking booklet that will provide the students' gaining general information about the unit. Prepare a booklet by getting benefit from different resources and stating your bibliography. **Please use booklet preparation directive.**
5.You are the first person who explore the gravity and makes studies in this field. You need a dynamometer with the aim of your studies being more creditable. Design you dynamometer. **Please use model preparation directive.**
6.A science fest is organized in your region. Short film scenario contest will be organized in this festival. The subject of the contest is ''Motion Energy'' You are requested to write a 500 words scenario and giving place the aspects such as strength, speed, direction of force-direction, speed in this scenario. **Please use scenario preparation directive.**

- A Layer Activity Plan

1.Imagine a place where gravity is not available. Write a composition on what differences may be between the World and this planet. Please pay attention on the aspects such as weight, gravity and mass including which writing composition. Also please take the daily life events into consideration while writing. **Please use composition writing directive.**
2. You are requested to prepare a discussion activity concerning to weight change in different planets. Please think about mass and gravity power of the planets in this discussion. Discuss why weights of the objects are different in different planets. **Please use discussion preparation directive.**
3.You are requested to prepare a documentary for primary school students from a television channel. The subject of the document is component powers. The documentary should include way and direction, balanced, unbalanced powers. **Please use documentary preparation directive.**
4.You are requested to publish a newspaper report concerning to weight and mass concepts. The newspaper advertisement should be prepared as a full page. Your aim in terms of giving a newspaper advertisement is to provide its being used right by taking attention on wrong use of weight and mass in daily life. **Please use newspaper advertisement preparation directive.**