



IMPLEMENTATION OF CREATIVE DRAMA BASED ACTIVITIES IN INTRODUCTORY PHYSICS LABORATORY COURSE

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Abstract

The aim of this study is to examine the effectiveness of the lesson plan that is prepared for the purpose of enabling the first year pre-service physics teachers to be acquainted with one another and to learn the rules of the course called "Introductory Physics Laboratory-I" in an entertaining way without getting bored. For this purpose, the first session of Introductory Physics Laboratory-I course is implemented according to the lesson plan that is designed based on the method of creative drama by the researchers. In this research three data sources have been used. The first one is a test that consists of 11 short answer items and 6 multiple choice items. The second data source is an observation form. Moreover as a final source, a semi structural interview was conducted with four pre-service teachers. The test scores were graded out of 100 points by the researchers. Average grade point was calculated as 90,5. Therefore, it can be argued that implementation of creative drama techniques is successful. When the data obtained from the observation forms and semi structural interviews were interpreted, it was determined that the introduction session of Introductory Physics Laboratory-I course had a positive impact on pre-service physics teachers.

Keywords: Creative drama, physics education, science education, preservice physics teachers, introductory physics laboratory

INTRODUCTION

The importance of the use of laboratory in science education is emphasized in many studies (e.g., Hofstein and Lunetta, 1982; Freedman, 1997; Buluş Kırıkkaya and Tanrıverdi, 2009). However, the previous studies that are performed have revealed that the number of science teachers using the laboratory facilities is very limited during the process of education (Akdeniz, 1993; Ayas 1993; as cited in Özdemir and Azar, 2004). According to the study performed by Gürdal (1997) at thirty seven secondary educational institutions, 90% of the students wants the physics lessons to be taught in the laboratory environment (as cited in Uzal, Erdem, Önen and Gürdal, 2010). Most of the students making a transition from the secondary education to university has almost never or merely been in a laboratory environment; however, it has been clearly observed that they are

individuals who are concerned about the laboratory environment and eager to study in the laboratory. Therefore, students' first laboratory lesson experience and impressions are of great importance.

The newcomers in the university begin totally a different and a new period in their life after a tiring and stressing preparation process before taking the university entrance exam. On top of that, many students leave their families and their hometowns for the first time and have to live in a different city to seek their university education. The students who are no more emotionally supported by their families and close friends are supposed to orientate in the new environment as soon as possible (Karahan, Sardoğan, Özkamalı and Dicle, 2005). Orientation activities are carried out at some universities for the newcomers to orientate in the university environment. However, orientation programs are applied only by few top universities in metropolitans (Kutlu, 2004). In this study activities designed according to the creative drama methods support the orientation programs. Creative drama enables individuals to animate on any subject (an experience, an incident, an idea etc.) through using techniques (improvisation, role play etc.) based on their previous experiences (San, 1991). Aykaç and Ulubey (2008) studied the creative drama in terms of enabling the student to participate actively in the process of learning, make group work, perform affective learnings etc. and concluded that creative drama is a convenient method for the constructivist approach. According to Adıgüzel (2006), it is not possible to accept the given information without discussion in the creative drama studies. Considering from this aspect, it is seen that creative drama is a convenient method for the constructivist approach.

The aim of this study is to examine the effectiveness of the lesson plan prepared to enable the first grade students who enrolled in Gazi Faculty of Education, Department of Physics Education to get acquainted with one another and learn the rules of the lesson of Introductory Physics Laboratory I (IPL I) in an entertaining way without getting bored.

METHOD

The participants of this study are the first grade students who enrolled in Gazi Faculty of Education, Department of Physics Education during the fall term of the school year of 2009-2010. The total number of the participants is 35 of whom 11 students are male and 24 students are female.

In the process of preparing the lesson plan, laboratory rules were primarily specified. While the total number of the specified rules is 16; 3 of them are given as example below:

- 1- Students are required to bring the following materials when they attend the lesson of IPL I: White coat, graph paper, ruler, pencil, eraser, calculator, glue and scissors.
- 2- Students are required to study the subjects from different sources as well, since it is not sufficient for them to study the theoretic subjects regarding the experiment to be carried out from the experiment page (a guideline that contains short theoretical information about the experiment and stages of the experiment) before the lesson.
- 3- Mid-term is graded as follows: An oral examination by each student during the lesson. Besides, each student submits their personal experiment reports at the end of the lesson. Oral examination and report are

assessed by the instructor and points are scored on a 10 point scale. By the end of the semester, each score a student receives from the experiments are culminated. The obtained total point is that student's mid-term mark.

A lesson plan was prepared in a way to enable the students to acquire the specified 16 rules and creative drama was used as a method in the lesson plan. Three preparation activities aiming at enabling students to be acquainted with one another (learn their names, hometowns, hobbies etc.) and with the environment were primarily included in the lesson plan. And then animation activities were included in an attempt to enable the students to learn the specified 16 rules. Animation activities were designed in such a way to be performed by students in 4 separate groups. 4 different cards are distributed to each group. One of the cards is given as an example below.

CARD NO: 2	
A	1- Is it sufficient to study the theoretical subjects concerning the experiment from the experiment page before the lesson? Or, should the subjects also be studied from different sources?
	2- How many lessons the compulsory attendance should be?
B	3- Every student should carry out their experiment with the same group of friends every week.
	4- Students should be on time; the missed quizzes are graded zero.

The lesson plan follows three steps. Firstly, each group of students try to find relevant answers for the questions on their card number under the heading of "A". Secondly, each group prepares their animation activities according to the 4 items on their cards. Finally, they animate their improvisations according to the order of the card numbers. The lesson plan is designed to allow a short discussion part following each group's animation to analyze the rules mentioned in the performance. The assessment activity is included at the end of the plan. While the classroom discussion aims at assessing the process, the test application which is included as an assessment activity aims at determining the learning levels of the rules.

The pilot application was conducted, a day before the main study, with 33 first grade students in the Department of Science Education, attending the IPL I course. Assessing the suggestions of two instructors and a student, who were involved in the pilot application as observers, the necessary changes were made in the lesson plan. According to this lesson plan, the main application has been performed for three course hours period (150 minutes) with the participation of 35 students in the Department of Physics Education, during the first session of the lesson of IPL I.

Three kinds of data collection tools were used in the study. The first data collection tool is a test, consisting of 11 short answer items and 6 multiple choice items, which aims at assessing the learning extent of students regarding the laboratory rules. The test has done by all of the students. The second data collection tool is an observation form consisting of open-ended questions, which aims at determining the effects of the application on students. The observation form has been filled by two observers. While one of the observers is a research assistant in the Department of Physics Education, the other is a second grade student who is registered in the Department of Physics

Education and who had attended the lesson of IPL I in the previous year. The third data collection tool, on the other hand, is a semi-structured interview. The interview has performed with four students, who took part in the application.

FINDINGS

Findings of the Test Data

All of the students did the test, which aimed at assessing their learning levels regarding the laboratory rules, after the application. The test of each student was assessed on a 100 point scale. As a result of the assessment, the average of all the obtained points was calculated as 90,5. Moreover, 94,3% of the students obtained points above 70.

Findings of the Data of Observation Form

Some of the questions and answers included in the observation form prepared for the aim of determining the effectiveness of the application on students are summarized in Table 1. The observer A is a research assistant in the Department of Physics Education and the observer B is a second grade student, who is enrolled in the Department of Physics Education and who had enrolled in IPL I course in the previous year.

Table 1. Examples of the questions and answers on the observation form

Question	Answer of the Observer A	Answer of the Observer B
How did the students participate in the preparation and warm-up activities?	At first they were puzzled, curious and trying to understand what was going to be done. However, the activities were performed seriously.	Since they knew neither one another nor the lesson content during the preparation and warm-up activities, the students behaved a bit reluctant in the first stages. But in the course of time, they became more interested in the activities.
How did the students participate in the animation activities?	During the animation activities, the students gave up their shyness, and participated in the activities willingly.	They were enthusiastic during the animation activities. They specified their duties in the activity in an enthusiastic and interested way; I observed the same interest and excitement while they were animating, as well.
How did the fact that the lesson was taught with creative drama activities influence the students?	The active participation of all the students shows that they enjoyed participating in their activities. However, the students who came to the class late were a bit bored.	I think that the fact that the lesson was taught with creative drama has influenced many of the students positively. I observed that they enjoyed and had great fun especially during the stage of "improvisation".

It is concluded from all of the answers that students generally behave in a timid way at the beginning of the preparation and warm-up activities, but get accustomed to the lesson tasks afterwards, show genuine interest in the animation activities. Students mostly enjoyed the animation activities. The lesson makes positive effects on students, most of them are able to communicate with one another. All these findings depict that the goals of the lesson are reached.

Findings of the Interview Data

Following the application, a semi-structured interview was conducted with 4 students. Some of the interview data are summarized in Table 2 for the purpose to determine the effects of the application on students.

Table 2. The Sample Interview Questions and Answers Given to the Questions

Question	Answer
Would you like to continue teaching the students that will come next year with creative drama activities? Why?	Three of the students A, B and C answered "yes" to the question. Their reasons why they would like to continue are that they have become better acquainted, socialized with their classmates and that visual and audio activities would be remembered more easily. Student D, on the other hand, answered "no" and explained that the creative drama activities are more suitable for students receiving education in social sciences departments.
Which one of the activities did you like most? Why?	Students A, B and C stated that they like the activities that include improvisations most and explained that they learn the rules in an entertaining way and they learn them through experience instead of saying "that's the rule". Student D, on the other hand, stated that he was there only because it was compulsory and did not like such activities. Additionally, he also stated that this department is not his preference and that he comes to the department unwillingly.
What were your thoughts about the lesson before you came?	Four students gave close answers with sentences like "I was thinking that we would get to know each other and then leave", "I had prejudice against university lessons, I was uncomfortable".
How did your thoughts about the lesson change after the application?	Students A, B and C stated that laboratory lessons would be enjoyable, teachers would behave warm and sincerely and there would not be rote-learning based instruction. Student D, on the other hand, stated that this lesson has no importance since he is already thinking of dropping out of the department.

Examining the answers, it was determined that students A, B and C have positive but student D has negative ideas about the activities in general. Besides, in parallel with the findings obtained from the observation form data, it was concluded that students mostly like animation activities. The lesson has influenced students positively and most of them are able to communicate with one another.

DISCUSSION

In this study, the effectiveness of the lesson plan, which was prepared for the purpose of enabling the first grade students who enrolled in the Department of Physics Education to get acquainted with one another and learn the rules of the lesson of IPL I in an enjoyable way without getting bored, was examined. The results of the study show that students have efficiently learned the laboratory rules. Additionally, it was observed that the data obtained from the observation form and interviews support one another, students generally behave timid at the beginning of the preparation and warm-up activities, they get over their shyness afterwards, they are enthusiastic during the animation activities, the lesson makes positive effects on students, most of them are able to communicate with one another, lesson acquisitions are obtained. The data obtained for one of the students who was interviewed (student D) shows that the student does not like the activities. The reason of this condition was determined to be the fact that the student had been

enrolled in the Department of Physics Education unwillingly and that he thinks of changing his department. In parallel with many studies (e.g., Başkan, 2006; Arieli, 2007; Sloman and Thompson, 2010), it was concluded in this study that creative drama activities have positive effects upon students.

CONCLUSION

The results obtained from the study are positive. However, there is a great gap in literature in terms of the studies aiming at using creative drama in the physics laboratory. Therefore, the studies in this direction could also be implemented in the same departments of different universities and as well as different departments that offer the lesson of physics laboratory (chemistry, biology, mathematics etc.). Besides, the activities that would introduce students to the laboratory materials and encourage using those materials effectively can be designed according to the creative drama techniques.

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