



BİLİMSEL SÜREÇ BECERİLERİ İLE BİLİMSEL YARATICILIK ARASINDAKİ İLİŞKİNİN BELİRLENMESİ

INVESTIGATING THE RELATIONSHIP BETWEEN SCIENCE PROCESS SKILLS AND SCIENTIFIC CREATIVITY

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Extended Abstract

Science process skills are the skills which each individual in the society must have to be a scientific literate. The individuals having these skills use these skills while solving the problems which they encountered in their daily lives. The process skills are divided into two groups such as fundamental and top level process skills. We can categorize these skills as creating questions, determining the problem, setting up hypothesis, determining the variables, designing the experiment, measurement, data collection, data presentation and assessment.

Creative thinking is very important for the individuals in recognizing the existing problems in their daily lives, in creating questions, and in determining the problem. When what creative thinking processes the individuals used while using the science process skills were investigated, it was seen that they consisted of the following steps:

- Determining the problem, wondering,
- Estimating and setting up hypothesis, trying to find solutions, comprehending the world around her/him,
- Designing the experiment,
- Testing the hypotheses, altering them, and resetting up hypotheses,
- Being able to solve the problem, and being sensitive against the problems,
- Being able to create new ideas as scientifically, technologically, and socially.

And as the creative thinking steps and scientific process steps were compared, it was seen that the science process skills (SPS) and scientific creativity (SC) coincided. Both of them appeared from the necessity to eliminate a problem. Then, hypotheses about how these problems could be eliminated were set up and experiments were done to test these hypotheses. At the end of the experiments, it was tested whether the problem eliminated or not by applying them.

Creativity takes a supplementary role in many science processes in the studies regarding science. It is used especially in introducing problems and hypotheses, and in designing the experiment for them. Therefore, in this study, it has been intended to determine the correlation between SPSs and SCs of the students at the end of the SPS training given to 7th grade students at elementary school. And the sub-problems defined for this purpose were expressed as follows:

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1. Is there any relationship between the SPS scores of the students which they got from work sheets and the scores of them which they got from SC scale?
2. Is there any relationship between the SPS scores of the students which they got from work sheets and the scores of them which they got from SPS scale?
3. Is there any relationship between the SC scores of the students which they got from work sheets and the scores of them which they got from SC scale?

For this purpose, in order to develop the SPSs, 28 work sheets containing SPSs for the chapter of “combination of force and motion - energy” in the 7th grade science course at elementary school were prepared. The work sheets were prepared in three forms such as close-ended, semi-open ended, and open ended. The chapter of “Combination of force and motion – energy” was instructed to students by these activities prepared to develop SPSs during 12 weeks. The application was performed in four parts. In the first part, SPSs were introduced by the daily life examples having science-content or not. At the second stage, the chapter was introduced by dividing into three parts, and in the first part of the chapter, training was performed by close ended work sheets i.e. the work sheets where everything was given to the students in details in order them to get to know the usage of SPSs. At the third stage, SPS training was given by the semi-open ended work sheets where some parts of them were incompleted in order to strengthen the SPSs. And at the fourth stage, in order the students to use SPSs on their own, the open ended work sheets where only problems were given had been handed over, and the students were expected to set up hypothesis directed to the situation in the given problem and to do experiments by using SPSs and to complete the work sheets as intended to this. The work sheets given in this last part were collected from the students, and evaluated by the SPS and SC assessment scales (rubrics) developed. At the end of the application, the effect of the training given for developing the SPSs on the students’ SPSs and SCs were examined, and existence of a correlation between SPSs and SCs of them were tried to set forth.

The subjects of the study consist of 20 7th grade students reading at an elementary school. At the end of the application, SPS and SC scales whose reliability and validity studies had been performed were applied to the students, and the work sheets which they filled out were evaluated by SPSEF and SCEF developed after reliability and validity studies had been performed in order to evaluate in terms of SPS and SC, and their SPS and SC scores were obtained. While evaluating the obtained data, the data were analysed by using the SPSS 11.0 package program. During the analysis of data, the existence of a correlation between them were examined by Pearson correlation coefficient. At the end of the study, it is found that there was a correlation between SPS and SC.