Examination of The Factors Influencing The Scientific Process Skills of The Students in The Elementary Education Department

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Extended Summary

Introduction
Today, many developed countries are designing contemporary, efficient, and applicable curricula and working for a higher quality education (Cerrah and Ayas, 2003). Scientific process skills make a great contribution to improving and sustaining quality of education. Because, the existence of scientific thinking depends on scientific process skills (Ango, 2002; Feyzioğlu, Demirdağ, Akyıldız and Altun, 2012; Padilla, 1990). In education, acquiring the knowledge to perform scientific activities is just as important as scientific process skills (Gupta and Cohan 2002). Therefore, laboratory applications and courses involving similar activities should be provided to students to facilitate acquisition of scientific process skills. For this reason, experiments in the learning process and applied activities are necessary for gaining scientific process skills.

This study aims to find an answer to the question: “What are the scientific process skills of first grader students at Department of Primary Education, and which factors affect these skills?”

Method
This study is a survey research aiming to find out the factors (university entrance scores, experiments and similar activities in high school education, places they grew up, book reading frequency, departments etc.) affecting the scientific process skills of first graders at the Department of Primary Education (Science, Mathematics, Classroom and Social Sciences Teaching). Target population of the study is constituted by first graders studying in the Department of Primary Education (Science, Mathematics, Classroom and Social Sciences Teaching) at various Faculties of

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The research sample was composed of 224 first graders students from Atatürk University, Kazım Karabekir Faculty of Education, Primary Education; 60 from Department of Science Teaching, 60 from Department of Mathematics Teaching, 52 from Department of Classroom Teaching and 52 from Department of Social Sciences Teaching.

Science Process Skill Test (SPST) and Student Identification Form (SIF) were used as data collection tools in the study. SPSS 20.0 packaged software was used for data analysis (URL-1). The results are presented in descriptive statistics, mean and standard deviation formats. From among predictive statistics analyses, one-way analysis of variance, simple linear correlation and simple regression analysis were applied.

**Results**

According to data from SPST, mathematics, classroom, science, and social teaching rank from high average to low average by primary education's departments. The score difference between the departments is also statistically significant ($p<0.05$). Moreover, there is a homogenous distribution of SPST scores by department. There is a moderately positive relation between SPST and the number of experiments in high school. SPST results regarding the book reading frequency of students tell that the ranking is classified into those always reading books, occasional readers and non-readers. Regarding secondary education experiments of students, SPST results rank from highest score to lowest as students conducting experiments with their teachers, students conducting experiments themselves and students presented experiments by their teachers. This statistically significant difference is also found in the sub-sections of the test. No relation was found between their scientific process skills and the students graduated from the types of high school, yearly income levels of families, and their home.

**Discussion and Conclusion**

In line with SPST results, the statistically significant difference between students conducting experiments and activities with their teachers, students conducting experiments themselves and demonstration experiments by their teachers shows that laboratory applications are highly important in improving scientific process skills (Bilen and Aydoğan, 2012; Geçkin, 2006; Hofstein and Mamlok-Naaman, 2007; Koray, Bahadır and Özdemir, 2004). According to the study, majority of the students conduct experiments or activities only once or twice a year. Data gathered from studies in our country also point to the fact that students mostly take courses on theoretical basis, and conduct little or no experiments and activities (Bulunuz, 2011; Diken, Çakır and Yetişir, 2009; Kaya and Gürbüz, 2002).

In this sample, the fact that families of the students choosing primary education departments of Education Faculties are in middle class. Because there is no clear differentiation in terms of educational opportunities and environments provided by their families, success of the students can be attributed to differences in their individual talents. For this reason, their scientific process skills are similar.
In conclusion, teaching basic subjects in depth should be preferred over teaching lots of subjects in the curriculum, and more emphasis should be put on teaching how scientific process and methods are applied. This will help the students in understanding the nature of science, how knowledge is acquired, perceiving the fact that what our knowledge depends on known facts and can change depending on new evidence, learning the basic scientific concepts, theories and hypotheses, and understanding the difference between scientific evidence and personal opinion. Improving thinking and analyzing skills of pupils depends on providing not only a high quality scientific education, but also scientific process skills. Moreover, we think that just like mathematics, physics, chemistry, biology tests in university entrance exams, new tests should be developed to measure scientific process skills. In-service training can be provided to raise awareness of teachers about this issue. More laboratory activities can be performed in schools. Students can be given conscious and efficient book reading courses and different activities and strategies can be developed to get them to adopt reading as a habit. We believe that it will be useful if OSYM (Student Selection and Placement Center) shares all central exam results with researchers for advanced analyses.

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