Scientific Development Skill Levels of Primary School Students Enrolled in Combined and Independent Classes

Sibel SARAÇOĞLU¹, Uğur BÖYÜK², Nagihan TANIK³

¹ Prof.Dr., Erciyes University, Faculty of Education, Kayseri-TURKEY
² Assist. Prof.Dr., Erciyes University, Faculty of Education, Kayseri -TURKEY
³ Research Assist. Erciyes University, Faculty of Education, Kayseri -TURKEY

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SYNOPSIS

INTRODUCTION

Analytical development skills are a lifelong learning development that forms the basis of analytical thinking and is used for problem solving and knowledge formation through the principle of learning-by-doing. In other words, it is the development whereby methods of gathering information are learned (Hazır & Türkmen, 2008). Scientific development skills are crucial for students. An overview of the studies carried out in this area reveals that there are multiple factors that may affect the scientific development skills of students and that the level of influence of these factors on the scientific development skill varies.

PURPOSE OF THE STUDY

The main purpose of this study, which was carried out on the basis of this premise, is to determine the scientific development skills of grade 4 and 5 primary school students in combined and independent classes and to compare the levels of scientific development skills in terms of different variables.

METHODOLOGY

The study group comprises 4th and 5th grade primary school students from 6 different primary schools, which were randomly selected from among the primary schools under the jurisdiction of the Kayseri Provincial Directorate of Education during the second semester of the academic year of 2009-2010. The study sample comprises 250 students selected randomly from 6 primary schools. In three of these schools, grades 4 and 5 are combined; grades 4 and 5 are taught separately in the other three schools involved in the study.

After the measurement tool was administered to the study sample, it was determined that 20 of the students did not fill out the measurement tool completely, and their measurement results were excluded from the analysis. Thus, the statistical analyses were carried out based on data from 230 students. For this study, a scientific development skill test

Correspondence Author email: saracs@erciyes.edu.tr

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was used. This test was developed by Burns, Okey & Wise (1985), translated into Turkish by Geban, Aşkar & Özkan (1992) and adapted for grade one primary school students by Çakar (2008). The Cronbach’s Alpha confidence coefficient of the measurement tool that was applied within the sample region was found to be 0.73. So the Cronbach’s Alpha for this sample region yielded acceptable value because of it is higher than 0.70 (Şencan, 2005).

The scientific development test used in our study consists of two parts. The first part of the test that was prepared by the authors consists of questions determining the variables such as gender, grade, education level of parents, family income level, number of family members and possession of a computer and a study room while the second part consists of 24 multiple choice questions with four answer choices that aim to determine the levels of scientific skill levels. We first determined a lecturer contact in each program. Before the administration, one of the authors made teleconferences with these lecturers to inform them about the aims of the study, possible questions to be raised by participants, as well as the administration procedure. Before administration of the questionnaires, the lecturers stressed that participation was voluntary, guaranteed that participants’ personal information would be treated confidentially, and all data would be solely used for research purposes. Almost all of the lecturers distributed the questionnaires in their regular classrooms and allowed time for the clarification of participant queries and for volunteers to complete the questionnaires, which took approximately 20 minutes.

Findings of the study were obtained by an analysis of data 230 students by means of SPSS 16.0 software package. With these analyses, descriptive statistics (frequency, percentage, average, standard deviation) were calculated and properties of statistical distribution were demonstrated. For every question in the scientific development skills test used in the study, correct answers were given a score of 1, while incorrect answers were given a score of 0. With the analyses done based on this scoring, a t-test was used to determine whether or not a significant variation exists between the averages of properties with dual variables at the significance level of p<0.05, ANOVA (analysis of variance) was used for the analysis for the properties with more than two variables. Brown-Forsythe and Welch statistics were used with ANOVA to make comparisons, because the number of members in each sample was not equal. A Tukey test was used as a post-hoc test when necessary.

FINDINGS

As a result of the analysis, the success level in terms of scientific development skills of the students in the combined class (37.3 %) were found to be lower than those in the independent class (52.0%). An analysis of the t-test shows that there is a statistically significant difference between the scores of the students in the combined and independent classes (p=0.00).

Based on the results of the analysis, the following findings were obtained: there is no significant variance between the students’ grade and their scores for all groups (p=0.77 for combined classes, p=0.11 for independent classes, p=0.29 for all students); while the effect of possession of a computer at home is statistically significant for the independent classes (p=0.00), it was found to be insignificant for the combined classes (p=0.74). The variance between the levels of scientific development skills of those students that possess a study room at home and those who don’t is statistically significant for the students in the independent class and insignificant for those in the combined class (p=0.98 for students in the combined class and p=0.03 for students in the independent class); it was determined that the level of education of the fathers of the students in the combined class did not affect the scores of the scientific development skills test (p=0.98) but that the level of education of the fathers of the students in the independent class did affect the scores of the scientific development skills test (p=0.00). While there was no statistically significant difference between the education level of
the mothers of the students in the combined class and their scores (p=0.47), there was significant variance between the scientific development skills scores of the students in the independent class (p=0.00). The number of family members has a statistically significant effect on the scores of the independent class (p=0.00), while the variance between the scores in the combined class were insignificant (p=0.95). It was determined that there was a significant variance between the family income level and the scores of the scientific development skills test (p=0.00).

Considering the whole group of students in the study, because variables of education level, number of family members, income level, possession of a computer and a study room are the variables that affect the scientific development skills levels, it was concluded that the families should provide their children with a convenient study environment where their motivation to study would be higher.

**DISCUSSION and CONCLUSION**

The results of this study indicate that the scientific process skill level of the students is moderate and that the scientific process skills of the students need to be improved. The study results also demonstrated that the success level of the students in the combined classes is lower than those in the independent classes. This finding can be explained by the limitation due to failure to meet most of the targets in the primary education curriculum in the combined classes (Erdem, 2004). Also, the higher level of success in the independent classes can be explained by similarity of maturity and presence of students at the readiness level.

In our study we also researched whether or not variables such as gender, grade, education level of the patents, income level of the family, number of family members and possession of a computer and a study room influenced the scientific process skill scores of the students. According to the findings of the study, the research variables did not affect the scientific process skill scores of the students in the combined classes. Looking at the influence of these variables on the scientific process skill scores in the independent classes, it is seen that these variables influenced the scientific process skill scores of these students.

**SUGGESTIONS**

Based on the findings of the study, the variables analyzed in this study do not affect the scientific development skills scores of the students in the combined class. This led the authors to conclude that the inadequate scores concerning scientific development skills of the students in the combined class may be the result of variables other than the socio-economic and demographical properties of the students. Thus, further studies to determine the possible factors that may affect the scores of the students, as well as the effect of these factors on the scientific development skills of the students, should be carried out.

**REFERENCES**


