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Students' interpretation of graphs in physics and mathematics

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Students are learning and using graphs in compulsory education in Republic of Serbia within physics and mathematics. Nevertheless, students have difficulties in using kinematics graphs and their misinterpretation is often [1]. Students' difficulties with graphs in physics are not necessary caused with the unsatisfying level of knowledge of graphs in mathematics [2]. Integration of physics is possible within every school subject, and the most obvious connections are in relation with mathematics [3] and chemistry [4]. Notwithstanding, students often do not recognize connection between these subjects and are not able to apply their knowledge of math graphics to physics. In order to assess the situation in Republic of Serbia, the research aiming to analyze students' interpretation of graphs in physics and mathematics was carried out.

Graphs are a part of the Physics 7th grade Curriculum while 7th grade Mathematics is dealing with dependent quantities. The research was conducted in an elementary school (Republic of Serbia). A suitable research sample was selected. Two classes of seventh grade students (13 years old) participated in the research, i.e., 57 students (26 boys and 31 girls). The test consisted of 10 tasks that were compiled by the researchers according to the subject Curriculum. Therefore, 5 tasks were based on the Motion (Physics) and another 5 on Direct and Inverse Proportion (Mathematics). This testing was realized through a standard paper and pen test that lasted for 45 minutes.

The result analysis showed that students had better accomplishments and understanding in math graphs. Also, the gender analysis showed that boys had better accomplishments in Physics than girls while girls had higher scores than boys when it comes to Mathematics. Based on the test results, it can be suggested that teaching graphs should be simultaneous in both subjects, Physics and Mathematics. Kinematics graphs, which are used in Physics, can be good examples when teaching and learning inverse proportion in Mathematics and the students can connect the formulas they learn in Physics with the appropriate formulas in Mathematics, that is, Direct and Inverse Proportion.

References

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Primary authors: Ms BLAJVAZ, Branislava, K. (Serbian Physical Society); Ms BOGOSAVLJEVIĆ, Dragana, B. (Serbian Mathematical Society)

Presenters: Ms BLAJVAZ, Branislava, K. (Serbian Physical Society); Ms BOGOSAVLJEVIĆ, Dragana, B. (Serbian Mathematical Society)

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