

Students' Interest in Physics – Study Results from Georgia

Marika KAPANADZE (1), Nino JAVAKHISHVILI (1), Lia DZAGANIA (1), Natela BAGATRISHVILI (2)

(1) Iliia State University, 3/5 Cholokashvili Av. 0162, Tbilisi, Georgia

(2) Iakob Gogebashvili Telavi State University, NI Kartuli Universiteti Str., 2200, Telavi, Georgia

Introduction

Students' interest in physics has been actively discussed during the last decades. Some researchers examined the relationship between motivation and attitudes of students towards physics [1]; other educators argued that students become more interested in learning physics, if they see the connection between physics and the real world. Market demand and prospective remuneration are also important for students' motivation and their choice of future professions. Many teachers stress the importance of co-curricular activities and laboratory work to enhance the interest of their students to physics [2].

Theoretical framework & research questions

The present study is a part of the international research project: ROSES (Relevance of Science Education – Second - www.miun.se/en/Research/researchgroups/roses/).

The research questions are formulated as follows:

1. What are the students' levels of interest in learning physics?
2. What physics topics are students interested in?
3. Are there any significant correlations between students' interests in physics and other factors defined in the ROSES study?
4. Are there any significant gender differences in interest in physics?

Methods and findings

The main aim of this paper is to identify students' interest in physics at the end of compulsory education and the beginning of upper secondary school in Georgia. Two stages of research are conducted. In the first stage of the study data were collected from 50 schools, which are members of the Science Teacher Network. In the second stage, a representative sample of 50 schools from the population of schools in Georgia (2,233 schools in all over the country) was surveyed.

The extensive tool developed within the framework of the ROSES project is a 4-point Likert-type questionnaire, consisting of 12 sections with a number of questions (items) in each section. There are 174 items in total and two open-ended questions.

Participants of the study are the students of 9th and 10th grade. For the first stage of the study data were collected from most of the regions in the country (8 regions from 11). In total, 1541 students participated in the survey. For the second stage, data are collected from all 11 regions of Georgia. In total about 2,500 students participated at this stage (the data collection is planned to be completed in March, 2024).

Results of the first stage

Exploratory factor analysis of 9 sections was conducted to define scales within sections. Overall, 18 scales (8 of these are interest scales) and 13 individual items were established. Correlation

analysis is conducted to detect notable links among the scales of interest. We found that the links between the scales were high or moderate, according to the effect size classification by Cohen. A particularly high correlation is observed between some scales, which means that students interested in Physics (scale 2) are also interested in environmental and sustainable issues – ecology, food and agriculture (scale 1), nature – animals, plants (scale 3), as well as science inventions and discoveries (scale 5).

We have also considered items from the interest in physics scale independently from each other. Frequency analysis shows that students are the most interested in *perception of light and colours, issues related with space, such as meteors, comets, black holes, etc.* and *the effect of electric shock on human body*; and students are the least interested in *detergents and soaps, musical instruments*. We calculated mean scores for 8 interest scales and compared them via ANOVA, which is statistically significant: $F(7,1520) = 303.099$; $p = .000$. *Phenomena, that scientists still cannot explain* and *factors affecting health and its care* attract the highest interest in participants. The lowest interest is observed for *eating disorders* and *skin care issues*. Interest in physics is slightly less than the overall interest score. Girls in Georgia show a higher interest in physics than boys.

Results of the second stage

The data collection for the second stage is planned to be completed in March, 2024. We will present comparison of these two stages at the conference. Our hypothesis is that the students, who participated in the first stage are more interested to study physics, then the students from the second stage. The teachers of the first stage students are motivated and open to educational innovations, and try to implement new learning and teaching approaches in classrooms.

Conclusion

Based on the findings of the present study some recommended/desired changes in physics Education in Georgia are already visible. Lack of interest in physics in girls is an important concern in most countries. A different picture is observed in Georgia, where girls show a higher interest in physics than boys. This is a very promising result from a gender equality perspective.

In general, the average score of interest in physics is not high. It means that changes in teaching approaches and curricular content are necessary for better involvement of Georgian students in the learning process. The authors of this paper also recommend changes in the teacher education programs at the universities, as the teacher qualification is crucial for the students' motivation and involvement in learning process.

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