

This bachelor thesis deals with students' misconceptions in kinematics graphing. The theoretical part describes the basic characteristics of didactic and conceptual tests. The processes of test development and standardization are summarised on a specific example of TUG-K test (Test of Understanding Graphs in Kinematics).

The new research included a translation of this TUG-K English test and its assignment to the students of Prague high schools and Faculty of Mathematics and Physics of Charles University in Prague; 171 students 16 – 19 years old participated as well as 41 undergraduates.

A study of certain test characteristics (item analysis) was performed. Principal statistical methods were used to interpret the obtained data. Results of this new research were compared with the results of J. R. Beichner, who authored the original version of the test used for research.

The test has been found to be less sensitive for university undergraduates than for high school students. Comparison of Czech and foreign students has revealed that Czech students achieved higher scores than the foreign ones. Typical misconceptions regarding student's work with graphs were confirmed. Eventually, a critical evaluation of the test was performed and certain alterations for the university undergraduates test case were proposed.