

Abstract: Quantitative and Qualitative Influences on Mathematical and Linguistic Performance. Patrick Meier. Dissertation.

The starting point is a marked increase in the number of mathematics and German lessons in the 2015 and 2017 semester tables in primary schools in the canton of Nidwalden. Performance tests were used to identify the immediate effects of this quantitative increase on the professional services. It examines the questions of how and to what extent benefits can be achieved by increasing the hourly table hour, by using learning surveys and other influencing factors. The theoretical superstructure is searched in the quality dimension and by five theoretical models under the control context. The present study builds on theoretical models such as the structure-coupling problem (Rolff, 2013), the educational production model (Scheerens, 1990), the model of quality and quality assurance (Ditton, 2000), the supply usage model (Helmke, 2004). 2007) and the model of teaching-learning time (Carroll, 1963).

The data were based on the results of the surveys conducted in 2015, 2016 and 2017 at the primary schools in the canton of Nidwalden (Switzerland). In the first year of implementation (2015), no mathematical and linguistic lessons were awarded. These were added in the following years, first at the intermediate level II (2016) and then a year later at the intermediate level I and the lower level. The overall study involved more than 3,200 second-, fourth- and sixth-grade students.

The scientific material from the performance tests consists of dichotomous basic data, which were processed by a one-parameter model (1 PL, Rasch model) depending on an item difficulty parameter. For the further evaluation of the performance measurement data, simple variance analyzes were carried out by t-test as well as multi-level regression analyzes. For the model estimates of the hourly increase in performance, only the multi-level regression was considered due to the complex nature of the model. The data of the deepening mathematics could be examined by means of interdependence analysis.

A trend has been confirmed that more instruction time at primary school also leads to better performance. Furthermore, it could be clarified that for mathematics a model of the parameters "gender", "migration" and "overtime" seems significant. The parameter "multi-hours" influences both mathematical and linguistic performance by about two percent each. For an estimated mathematical term of 510.78 points, 10.86 points ($p < .005$) are explained by multiple lessons. For the test area German, the model had to be supplemented with the grade affiliation. Thus, with an estimated term in German of 498.02 points around 8.29 points ($p < .014$) are justified by multiple lessons. The supplemented step refinement shows in a model that a multiple lesson in the lower level (test 2nd class) results in an added value of around 36.28 points ($p < .000$). This leads to the realization that additional hours in the subject of German are accompanied by greater achievements, especially in the lower classes.

The increased time factor is an important lever to better performance in general. The anticipated performance advantage of boys in mathematics and girls in German could not be reduced despite more hours. Although both groups benefited from additional hours, there was no reduction in the difference. The same findings were made by the German-speaking students compared to foreign-language learners: Both population subgroups increased their performance and generally achieved better results, but there was no reduction in the difference or approximation of benefits.