

**The assessment of statistics learning by large-scale standardized tests:  
some evidences in the Italian primary and secondary education**

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Over the past decade there has been an increasing request for statistical literacy, statistical reasoning, and statistical thinking that need to be addressed if future adults have to become more informed citizens. In Italy the teaching of Statistics has been integrated into the mathematics curriculum as a fundamental topic at all grades and types of schools.

In this paper we present the results of student performances coming from national standardized tests. In the test for assessing mathematics competences, there are several items devoted to statistical learning. We consider the data coming from the national tests administered at the fifth, eighth and tenth grade of education by the National Institute for the Evaluation of the Educational System (INVALSI) to Italian students.

The main objective is to analyse if student outcomes have significantly changed in the last years. It is also interesting to study if the structure and domain context of the items have been improved to follow both the international standards and national curriculum. The results show that students perform well as regard to the statistical literacy but have some lacks on statistical thinking. These evidences allow to find suggestions for remarkable adjustments in teaching statistics.

Finally, the paper discusses some guidelines to encourage the integration between assessment and learning statistics at each school grade.

**Keywords:** ability evaluation, statistical literacy, student outcomes, teaching statistics