Latent growth and statistical literacy. Some evidence from Italy

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Abstract

The study of statistics, in degree programs not specifically designed, is one of the most difficult obstacles to overcome in the students' perspective. Italian students have a superficial knowledge of mathematics and they tend to assimilate the statistics to the mathematics so they develop prejudices towards statistics too. In the last time the PISA-OCSE surveys indicate a slight improvement in the understanding of mathematics at the level of high school, however, we are still far from the European average. The statistical literacy can be considered as latent construct measured through observed repeated variables linked to the passed exams . In detail, the analysis uses the scores generated from e-learning tool (MathXL) in 10 repeated occasions for each student conjointly to demographic and social aspects. The analysis of the statistical literacy growth carries on three cohortes of students in an Italian humanistic university for the academic years 2012-2013, 2013-2014 and 2014-2015 (respectively $n_{2012-2013} = 378$, $n_{2013-2014} = 402$ and $n_{2014-2015} = 450$)in students perspective. The statistical learning growth is investigated both through nonlinear latent growth modeling and latent state trait analysis. This choice comes from the rejection of linear trajectories previously tested and confirmed in the literature. The results for former two academic years highlight a nonlinear growth with an effect of voto di diploma. The same results have been confirmed by latent state trait analysis. For the last academic year, the results can be avaible after ending of the course on April 2015..

Keywords: latent growth model; latent state trait analysis; Gompertz curve.