Does Public Investment in ICTs Improve Learning Performance? Evidence From Italy

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## Authors

Gui M.;Parma A.;Comi S.

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## Sample

Data comes from the merging of student SNV/INVALSI test scores from
the final exams of lower secondary schools with information from the “Technology
Observatory” of the Italian Ministry for Education. The sample is composed of 14-year-olds

# Abstract

This article provides a detailed and robust estimate of the impact of three different digital technologies (interactive whiteboards, wireless connections, and mobile devices) on Italian language and mathematics performance in lower secondary schools in Italy. Our analysis of longitudinal data from 2010 to 2014 shows that no significant effects emerge at a national level from increased stocks of any of the three technologies, confirming the existing literature. However, when controlling for geographical area, we show that all three technologies had a positive effect on mathematics results in the north of Italy, with a detrimental effect in the south. We find that the positive effect in the north was driven by low-attaining schools, while the negative impact in the south was driven by higher attaining schools. No effects were found on Italian language performance, except for a slightly positive impact in the lowest-achieving schools in all geographical areas. The significance of these results is discussed with regards to future public intervention and research in this field.

# Outcome

This paper estimated "the effect of the increase in schools’ stock of three specific technologies (IWBs, Wi-Fi connection, and mobile devices) on
learning outcomes in mathematics and Italian language, controlling for fixed
effects.
The results show that at a national level no significant impact emerges for
any of the three technologies considered. These results challenge the—often
implicit—assumption that the provision of ICT exerts an important influence on
school learning levels.
At first sight, it appears that policies aimed at the rapid introduction
of ICTs in schools are not avoiding the destiny of every tool in the history of
school technology, that is, of failing to fulfill the expectations they had fostered
(Cuban, 1986). This is all the more relevant in the light of experimental research
showing that other kinds of educational interventions (e.g., self-reported grades,
classroom discussion, self-questioning) show a greater impact on learning (see
Hattie, 2009). [...]
However, the second part of our study adds relevant detail that shows how
this general finding conceals different impacts in the different subgroups of our
sample. Indeed, an analysis by geographical areas shows that—as far as
mathematics is concerned—schools in northern Italy seem to benefit from the
increase of their technology stock, with no significant results emerging in the
center, and even a negative effect being visible in the south of Italy. In this way,
in poorer areas of the country, technology seems to be not only irrelevant but
even detrimental to learning outcomes.
(Gui et al., 2018, pp. 153-154)