

## **COMPUTERS IN THE CLASSROOM: New evidence that they need to be used carefully to improve results**

The use of technology in schools has to be managed carefully for it to have a positive effect on pupils' academic achievement, according to research by **Ludger Woessmann** and colleagues, to be presented at the annual congress of the European Economic Association in Mannheim in August 2015. Their study finds that if computers are used to look up ideas and information, pupils' outcomes improve; but using computers to practise skills reduces pupil achievement.

Woessmann, who is director of the Ifo Center for the Economics of Education, explains that using computers in the classroom does not lead to an improvement in the average performance of pupils in maths and science. But the average result masks the fact that the use of computers has opposing effects in different areas. The study covers the maths and science achievement of over 400,000 students in fourth and eighth grade from over 50 countries on the TIMSS international student achievement test.

'The overall 'null effect' is sobering, but frequently proven', notes Woessmann. 'What is new about our results is that this null effect arises from a combination of positive and negative partial effects,' he explains. 'If computers were to be used more to search for information and less for practicing skills, computers could be used far more effectively in classrooms and with better results.'

'Many proponents hope that computer-assisted instruction will constitute a technological breakthrough that will fundamentally revolutionise education', says Woessmann. 'Our findings show that a qualitative improvement in teaching will only occur if we focus on using computers for specific activities where this makes sense and creates real added value.'

However, 'its potential effects on the ability to use computers are not investigated,' notes Oliver Falck, Director of the Ifo Center for Industrial Organisation and New Technologies. 'Our results are based on how student achievement in traditional school subjects is affected.'

These results are important because a lot of money is being invested in equipping schools with computers and internet access. Proponents hope that computer-assisted teaching methods that replace traditional, lecture-style teaching will lead to significant improvements in student achievement.

A possible interpretation of the new findings is that using computers for practicing skills takes up time that could be more effectively spent on traditional teaching methods. By contrast, teaching time appears to be used relatively productively if computers are used to search for information and ideas.

To obtain their empirical results, the authors used modern microeconomic methods that allow going beyond mere correlations and getting closer to the estimation of causal effects. The effects are stronger for children from socio-economically advantaged backgrounds and are mostly restricted to developed countries.

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'Virtually No Effect? Different Uses of Classroom Computers and their Effect on Student Achievement'

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CESifo Working Paper No. 5266

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