The relationship between ICT and student literacy in mathematics, reading, and science across 44 countries: A multilevel analysis

# Details

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## Sample

305,414 15-year-old students from 11,075 schools across 44 countries, 5860 from Switzerland

## Implications For Educators About

School innovation

## Implications For Policy Makers About

Other

## Other PolicyMaker Implication

Opportunities of the use of technology in the classroom

# Abstract

This study conceptualized ICT as multi-level (country-, school-, and student-level) constructs and
examined their relationships with student mathematics, reading, and scientific literacy. Threelevel
hierarchical linear models (HLM) were employed to analyse the Programme for
International Student Assessment (PISA) 2015 data of 305,414 15-year-old students from 11,075
schools across 44 countries. The findings indicated that (i) national ICT skills had a more positive
effect on student academic performance than did national ICT access and use; (ii) students ICT
availability at school positively associated with student academic success, whereas student ICT
availability at home negatively associated with student academic success; (iii) student ICT academic
use negatively correlated with student performance, while ICT entertainment use positively
correlated with student performance; and (v) student attitudes toward ICT demonstrated
mixed effects on student academic success – specifically, student interest, competence, and autonomy
in using ICT had positive correlations, while student enjoyment of social interaction
around ICT had a negative correlation with student academic performance.

# Outcome

In this study, we examine the relationship between national-, school-, and student-level ICT factors and student mathematics, reading, and scientific literacy. The results indicated that ICT explained considerable variance in student academic performance (especially at the national- and school-levels); besides, different ICT factors showed diverse influential patterns on student learning outcomes.