

Technological change and social inequality in online education at home: New empirical evidence from OECD countries

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In recent decades, technological advancement has diffused across countries worldwide at different paces and magnitudes (Thamprasert, 2020). Many students now have more access to computers and online education has become an important part of education (González-Betancora, López-Puigb and Cardenal, 2021). However, empirical evidence has shown that the use of the Internet for online education outside school is socially stratified (Becker, 2022). In spite of the growing body of research on both technological changes (Kristal, 2020) and the digital divide (Van Dijk, 2020), little is known about whether technological advancement benefits students from all social strata equally. Does the technological advancement that should provide better access to computers and the Internet equalize inequality in online education use at home? Does this depend on the level of use (high vs. low frequency use)? The current study makes a contribution to the literature by providing empirical evidence regarding the role of technological change in shaping social inequality in the use of the Internet for educational purposes at home in 26 OECD countries.

We used a harmonized dataset from the PISA 2009, 2012, 2015 and 2018 waves that included 585,201 students from 26 OECD countries, including European countries, to explore our questions empirically. Using multilevel linear models with cross-level interactions and country fixed effects, we tracked the spread of the Internet across the populations in these countries over almost a decade. We explored how this technological

advancement as a macro level factor changed the social inequality in online education at home in groups of students with different levels of educational resources at home. As a measure of social inequality, we compared the differences in online education use for students with more and fewer educational resources at home, because these resources are considered important cultural capital in the knowledge society.

Our findings show that Internet diffusion both compensates for and increases social inequality in online education use, depending on the level of use. Specifically, Internet diffusion in a country reduces inequality in the basic use of online education at home, but it increases inequality at the highest level of use. Students with more educational resources at home are better positioned than those with limited resources to use the new technological learning opportunities. Thus, they spend more time using the Internet for schoolwork as opposed to other purposes. In order to equalize educational opportunities, policymakers should provide better educational resources at home for disadvantaged students.

References

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