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THE USAGE AND IMPACT OF DIFFERENTIATION:

EVIDENCE FROM AN ONLINE EDTECH PLATFORM

ABSTRACT:

We study the impact of a digital differentiation tool on student learning outcomes across socioeconomic segments, taking into account teachers' usage and implementation of differentiation. Using a structural model incorporating a hidden Markov model and a two-stage process for teachers' differentiation decisions, we assess the tool's effectiveness in improving student performance and addressing educational disparities. Our findings suggest that while the differentiation tool has the potential to improve student learning outcomes, its actual effectiveness is hindered by limited usage among teachers, regardless of socioeconomic background. Furthermore, our analysis reveals that teachers from different socioeconomic segments exhibit varying preferences when implementing differentiation, with low-poverty school teachers prioritizing medium-achieving students to a greater extent. To enhance student learning outcomes and address educational disparities, we explore possible interventions in our counterfactual analyses. We find that while cost reduction encourages greater tool usage and benefits students, the effect is more pronounced in low-poverty schools, potentially exacerbating the existing gap between socioeconomic segments. We further identify targeted professional training that enhances the valuation of the differentiation tool in high-poverty schools as a potential strategy to mitigate the negative impact of cost reduction on education disparity and bridge the usage divide between socioeconomic segments. Our findings emphasize the need to consider not only product design but also the usage divide to maximize the effectiveness of differentiation tools and promote equitable education.