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How curriculum and classroom achievement predict teacher time on lecture- and inquiry-based mathematics activities.

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Summary: This study drew on data from a large, randomized trial of cognitive tutor algebra (CTA) in high-poverty settings to investigate how mathematics curricula and classroom achievement related to teacher reports of time spent on inquiry-based and lecture-based mathematics activities. We found that teachers using the CTA curriculum reported more time on inquiry-based activities and less time on teacher lecture activities overall compared to non-CTA teachers. However, both CTA and non-CTA teachers of the highest-achieving students spent more time on inquiry-based activities compared to teachers of lower-achieving students. Additionally, CTA teachers in classrooms with the most low-achieving and non-gifted students reported almost as much time on lecture-based activities as their non-CTA counterparts. Qualitative findings suggest that CTA teachers engaged in more traditional lecture-based activities and fewer inquiry-based activities when they thought their lower-achieving students could not tackle the reading open-ended activities in the curriculum without explicit demonstration and traditional practice problems. CTA thus appeared to increase inquiry-based activities in teachers' classrooms overall. However, lower-achieving students may have had needs unaddressed by the CTA curriculum. These findings thus imply that districts should think carefully about how to implement CTA and – potentially – other inquiry-based curricula in order to support teachers of students with the highest needs and least preparation.

Classification: C70 C60 D40 D30

Keywords: educational research; USA; mathematics curriculum; cognitive tutor algebra curriculum; evaluation; equity; minority education; teaching methods; inquiry-based activities; discovery learning; exploratory learning; peer achievement; educational diagnosis; teaching-learning processes; prognoses
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