

# The Role of Human Support in Student Engagement with AI Tutoring Platforms

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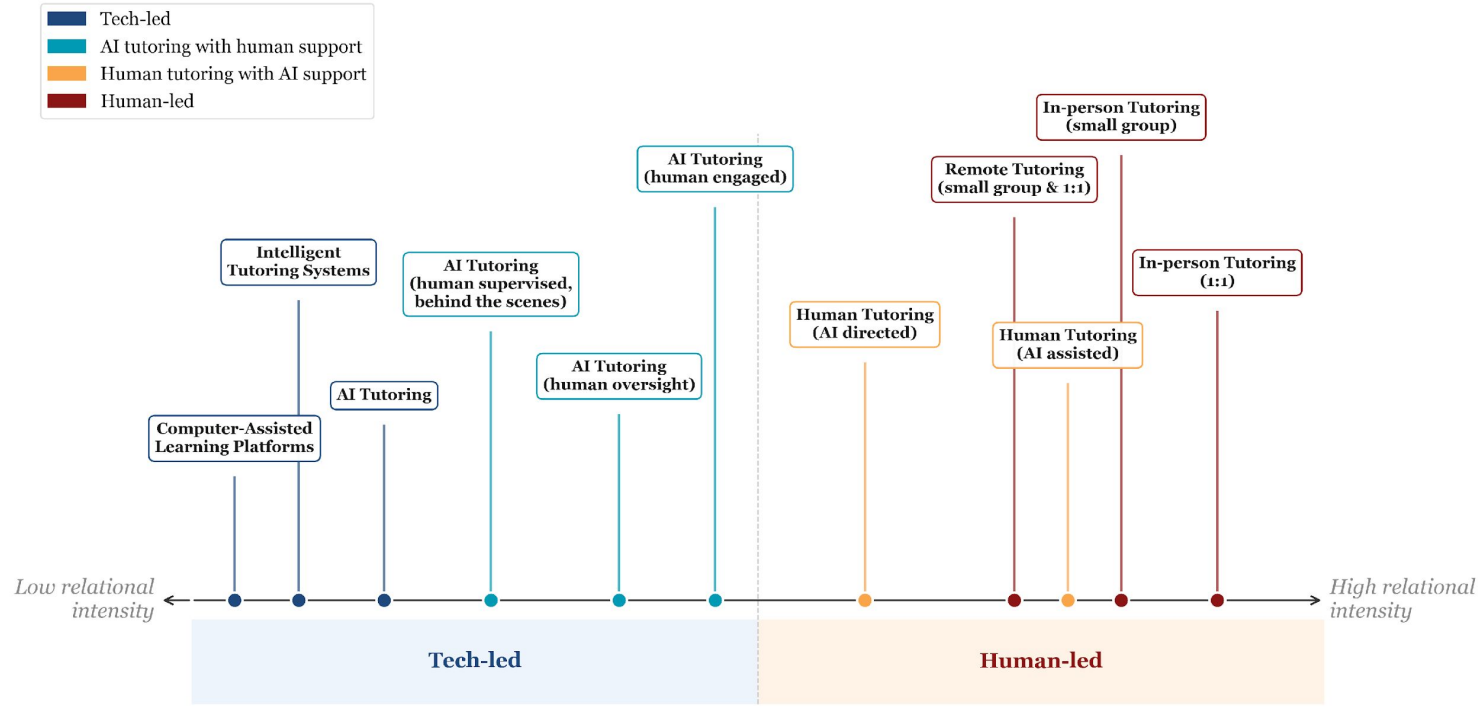
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# The promise and challenge of AI tutoring

- AI tutoring tools are becoming more common in K–12 classrooms, with emerging (but mixed) evidence of effectiveness
- One necessary precursor to effectiveness: students must actually use the platform consistently
- Online learning has historically struggled with low engagement — AI tutoring is no exception
- **We know humans can provide motivation and accountability. What's the best way to effectively deploy humans to support AI tutoring?**

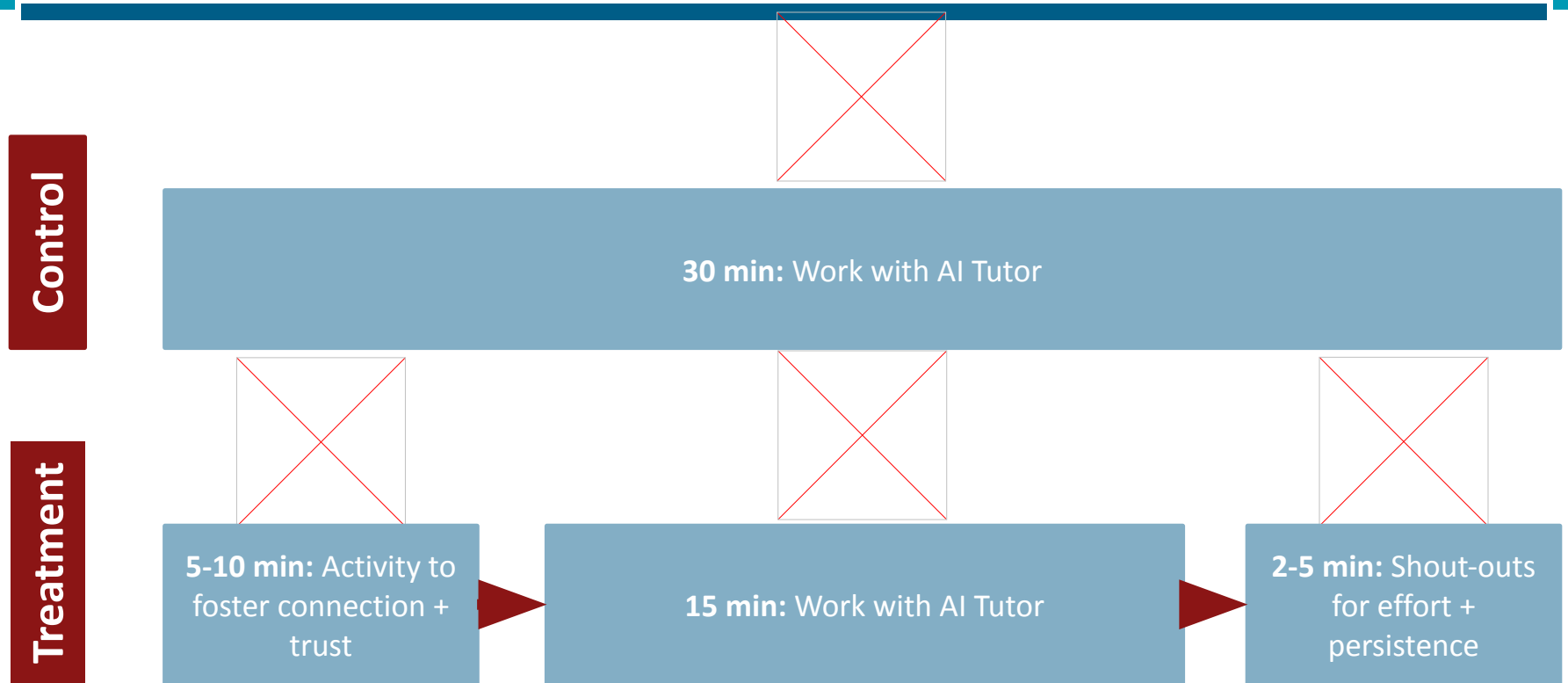
# Personalized instruction: On a spectrum of relational intensity



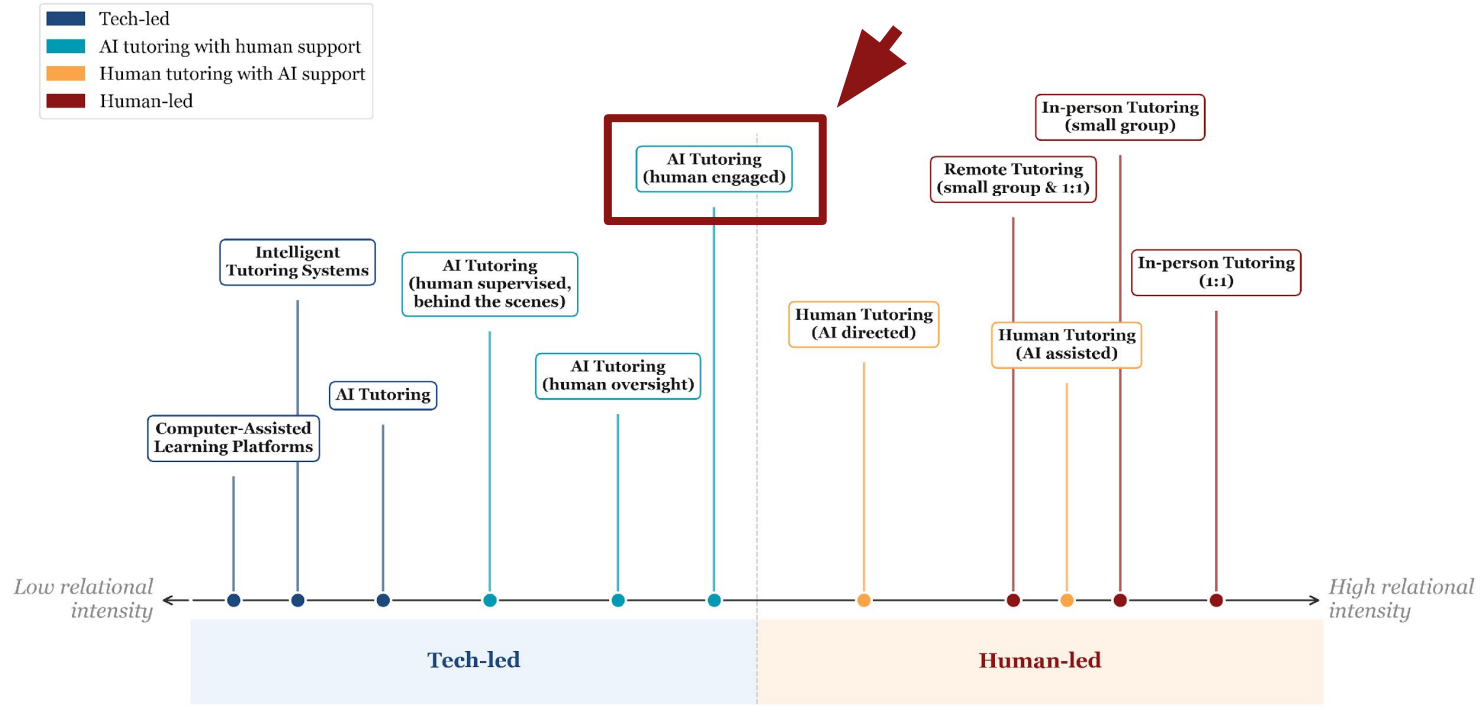
# Can a human tutor increase student usage and engagement with an AI platform?

- AI literacy tutor format
  - o 1 semester (in practice: 14-31 weeks)
  - o 30 minutes/session (goal: at least 30-min per week)
  - o 2 sessions/week
- AI-led tutoring with human engagement
  - o 1 training
    - Socioemotional support, motivation, and accountability
    - Science of reading foundations
    - Establishing classroom reading norms
    - Troubleshooting tech issues
  - o Session structure

# Session structure



# Personalized instruction: On a spectrum of relational intensity



## 2 randomized controlled trials

### Study A:

#### Program staff as after-school tutors

- 5 after-school program sites
- 1<sup>st</sup>-5<sup>th</sup> grade students
- Student-level randomization, stratified by site + grade
- N = 174 students (Control = 90; Treatment = 84)

### Study B:

#### Middle school students as in-school tutors

- 2 K-8 schools
- 1<sup>st</sup>-3<sup>rd</sup> grade students
- Student-level randomization, stratified by school + class
- N = 181 students (Control = 145; Treatment = 36)

# Research questions

## Preregistered research questions

- **Usage:** Does assignment to a human tutor increase the minutes spent on the AI platform?
- **Engagement:** Does assignment to a human tutor lead to reading more stories?

## Exploratory research questions

- **Achievement:** Do changes in usage/engagement translate to improved literacy test scores?

# Baseline student usage of the AI tutor was low

## Control Group

### Study A:

- Only **60.7%** of control students ever used the AI platform
- Average weekly use: **2.18 minutes**
- On weeks students did log in:
  - **13.8 min/week**

### Study B:

- Only **53%** of control students ever used the AI platform
- Average weekly use: **5.23 minutes**
- On weeks students did log in:
  - **School A: 3.2 min/week**
  - **School B: 18.3 min/week**

When students did use the AI tutor in a week, they were using it more meaningful amounts

# Take-up differed by student characteristics

Control Group

	Study A		Study B	
	Used	Did not use	Used	Did not use
English learners	13%	15%	35%	32%
Economically disadvantaged	86%	97%	89%	82%
Students with disabilities	9%	21%	11%	35%
BOY literacy score	0.38-sd	-0.35-sd	0.28-sd	0.09-sd

# Human tutors increase student usage of the AI tutor platform

	Usage: Ever used	Usage: Avg mins per week
<b>Study A</b>		
Treatment Effect	0.075 (0.065)	0.995+ (0.578)
Observations	174	174
Control mean	0.607	2.179
<b>Study B</b>		
Treatment Effect	-0.013 (0.084)	4.424* (1.879)
Observations	181	181
Control mean	0.533	5.233

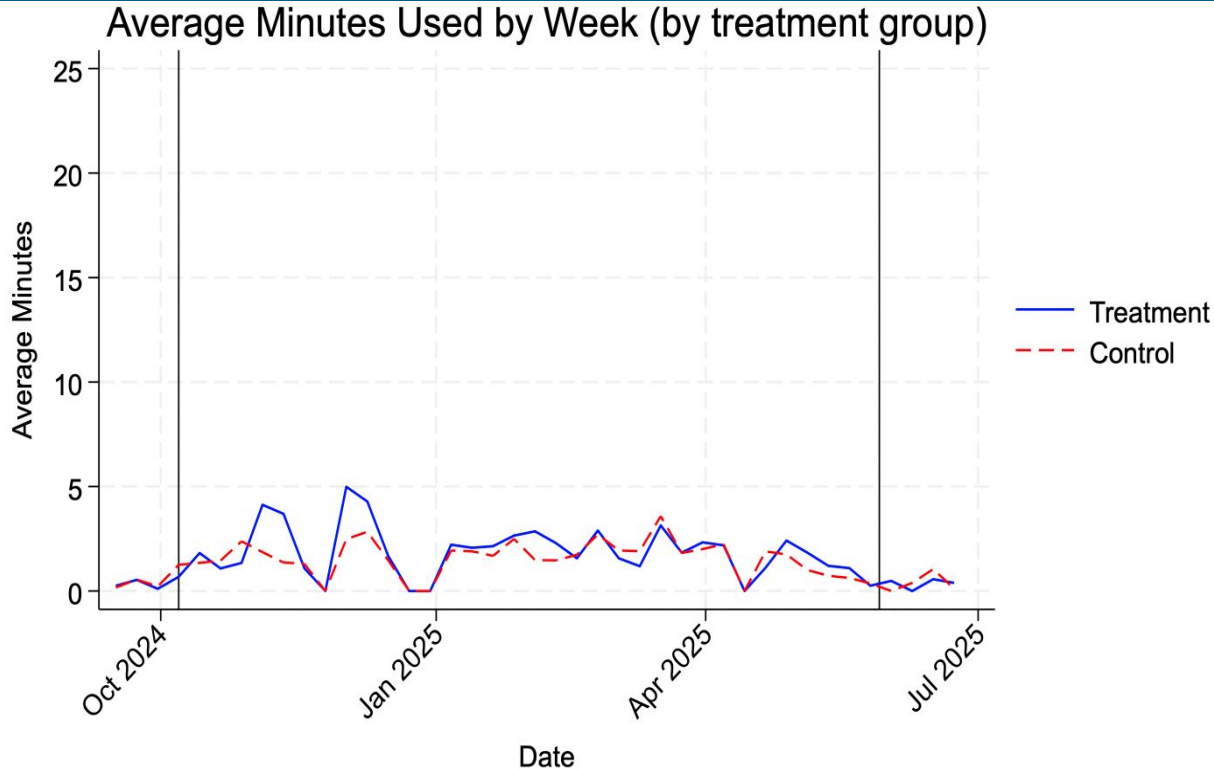
46% increase

~22 additional min  
over the year

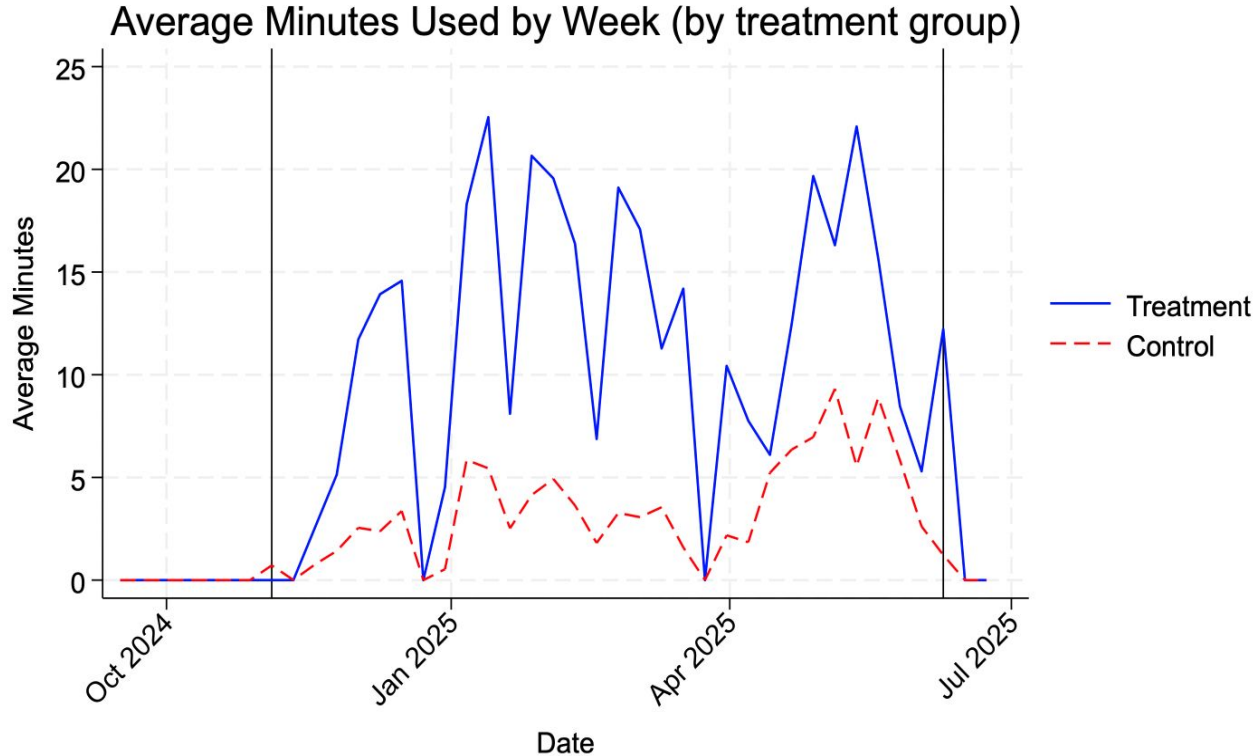
85% increase

~98 additional min  
over the year

# Study A: Program staff as after-school tutors



# Study B: Middle school students as in-school tutors



# Human tutors drive greater engagement with content, beyond just time spent on the platform

Engagement: Avg stories per week	
<b>Study A</b>	
Treatment Effect	0.201* (0.093)
Observations	174
Control mean	0.280
<b>Study B</b>	
Treatment Effect	0.916* (0.373)
Observations	181
Control mean	1.138

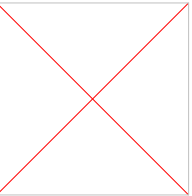
72% increase  
~4.5 more stories  
over the year

80% increase  
~1.5 additional  
stories/week

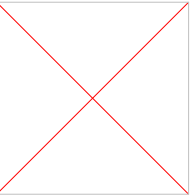
# The modest increase in engagement did not translate to end-of-year academic gains

	Achievement: Avg EOY reading score (std)
<b>Study A</b>	
Treatment Effect	-0.052 (0.086)
Observations	166
Control mean	0.150
<b>Study B</b>	
Treatment Effect	-0.129 (0.143)
Observations	161
Control mean	0.100

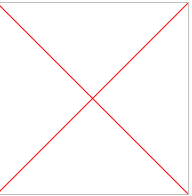
# Key Takeaways



**Availability of AI tutoring platform does not necessarily mean students are using it:** We can't expect to see learning gains if students aren't meaningfully engaging and getting the necessary dosage. Struggling students may be less likely to take up the resource.



**Implementation conditions matter:** Site and classroom-level variation mattered a lot for how much students used the AI tutor



**Hybrid human-AI tutoring shows promise:** The human component should have decreased the amount of time students spent using the AI tutor; however, we saw the opposite. Human support can provide the necessary accountability and motivation students need to work with an AI tutor.

# Thank you! Questions?

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