

## We know that doing practice while reading, or learning by doing, increases learning gains for students (called the Doer Effect).

However, this practice is costly and time-consuming to create. To overcome this barrier, we developed automatically generated questions using artificial intelligence. We studied these questions by asking: are these automatically generated questions a viable option to scale learning by doing?

Here's what you need to know about the research:

- 1 By using artificial intelligence for automatic question generation, we can reduce the time and cost of developing formative practice questions, but it is critical that automatically generated (AG) questions have a level of quality on par with human-authored (HA) questions in order to be confident in their usage at scale.



Engagement with the AG question types was similar to HA types/ learn-by-doing methodology w

- 4 There was no evidence that students preferred HA over AG questions. Rather, this research revealed that the recognition or recall format of a question had the greatest impact on initial engagement, and that difficulty had an impact on persistence.



would only have the original textbook.