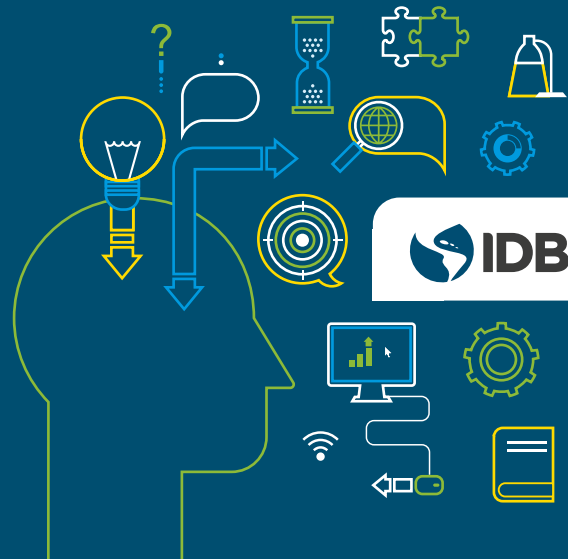


# How Can Behavioral Nudges Be Leveraged to Boost Student Effort and Achievement?

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Authors: Raphaëlle Aulagnon, Julian P. Cristia, Santiago Cueto, and Ofer Malamud.



Highlighting streaks of consecutive activity significantly increased students' engagement with an online math platform, particularly by encouraging frequent use by students who use the platform at least once.



Students whose streaks were highlighted showed measurable improvements in math achievement, demonstrating the potential of gamified behavioral interventions to enhance educational outcomes.



Nudges that involve highlighting streaks could be used more broadly in education and other areas to promote desirable behaviors.



## CONTEXT

Peru's education system, like many in Latin America, faced significant disruptions during the COVID-19 pandemic. The closure of schools in 2020 and 2021 exacerbated existing challenges in math education. To address learning losses, the Ministry of Education supported the use of a math learning platform (called "Conecta Ideas Peru") aligned with the national curriculum. This study investigated whether behavioral nudges, such as highlighting streaks of consecutive participation, could increase student effort and improve learning during the summer break.



## PROJECT

A randomized experiment was conducted in the summer of 2022 involving 60,000 Peruvian students from grades 4 to 6 who had used the math learning platform during the 2021 academic year. A control group received no messages, and one treatment group was sent generic reminders to complete a weekly set of 30 math exercises. A second group received, in addition to weekly notifications, a reminder if the exercises had not been completed or congratulations if they had been completed. The third treatment group received weekly notifications plus a message mentioning the number of weeks of continued use of the platform.

## RESULTS

### All interventions showed significant effects on platform use compared to the control group.

On the extensive margin (initial engagement), personalized reminders were most effective at encouraging students to connect to the platform at least once during the six-week period, increasing the likelihood by 3.8 percentage points compared to the control group. Highlighting streaks also showed a sizeable effect, increasing initial engagement by 2.8 percentage points, outperforming generic reminders, which increased initial engagement by 1.4 percentage points. On the intensive margin (sustained engagement), highlighting streaks showed larger effects than personalized reminders in terms of fraction of weeks connected conditional on connecting at least once (9.4 vs. 6.9 percentage points). The effects on this outcome were smaller for generic reminders (2.5 percentage points). This suggests that streaks are particularly effective at fostering repeated engagement over time. Measures combining both margins, such as the percentage of exercises attempted, showed similar effects for streaks and personalized reminders. Each increased use by over 100% relative to the control group's baseline levels. [Figure 1](#) shows the effects of the interventions on the extensive and intensive margins during the six weeks of the experiment.

#### Key Concept

### BEHAVIORAL NUDGES

Low-cost interventions that use insights from behavioral economics and psychology to influence individual decisions and actions.



In regard to learning outcomes, students whose streaks were highlighted demonstrated significant improvements in math achievement, with end-line test scores increasing by 0.13–0.17 standard deviations. The effect of personalized and generic reminders on learning was positive but smaller and often statistically insignificant. Further analysis revealed that students who used the platform during weeks covering specific topics (e.g., geometry,

probability) showed higher achievement on those topics in the endline test, emphasizing the role of targeted engagement in driving learning gains.

Overall, the findings indicate that behavioral nudges, particularly streak-based messaging, can effectively enhance both engagement and academic performance, offering a promising approach for scalable interventions in education.



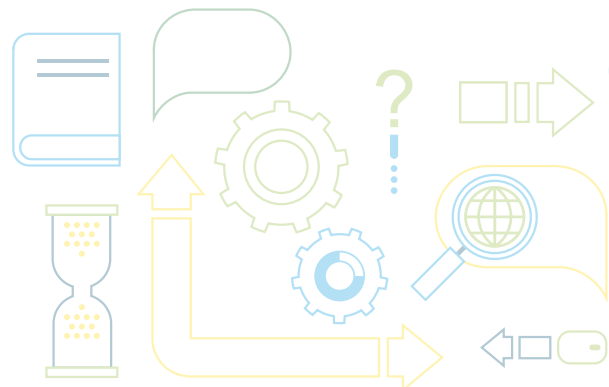
## POLICY IMPLICATIONS

### The findings have a variety of implications for policy design and implementation.

First, behavioral nudges can result in sustained engagement. In particular, highlighting streaks is a low-cost, scalable intervention to foster long-term engagement in educational activities. Policymakers could incorporate such strategies to enhance existing digital platforms.

Tailored communication strategies are likewise useful. While personalized reminders encourage initial participation, streak-based messages are effective in maintaining consistent use. Combining these approaches could maximize both initial uptake and sustained engagement.

As the success of streak interventions underscores the value of gamification in education, it is important to design and implement scalable gamification models. Expanding the model in this study to include other subjects or age groups could address learning gaps more broadly.



Interventions of this type, however, depend on integrated support for learning platforms. Gamified features, such as streak tracking, must be complemented with quality content, teacher training, and parental involvement to ensure that increased engagement translates into academic benefits.

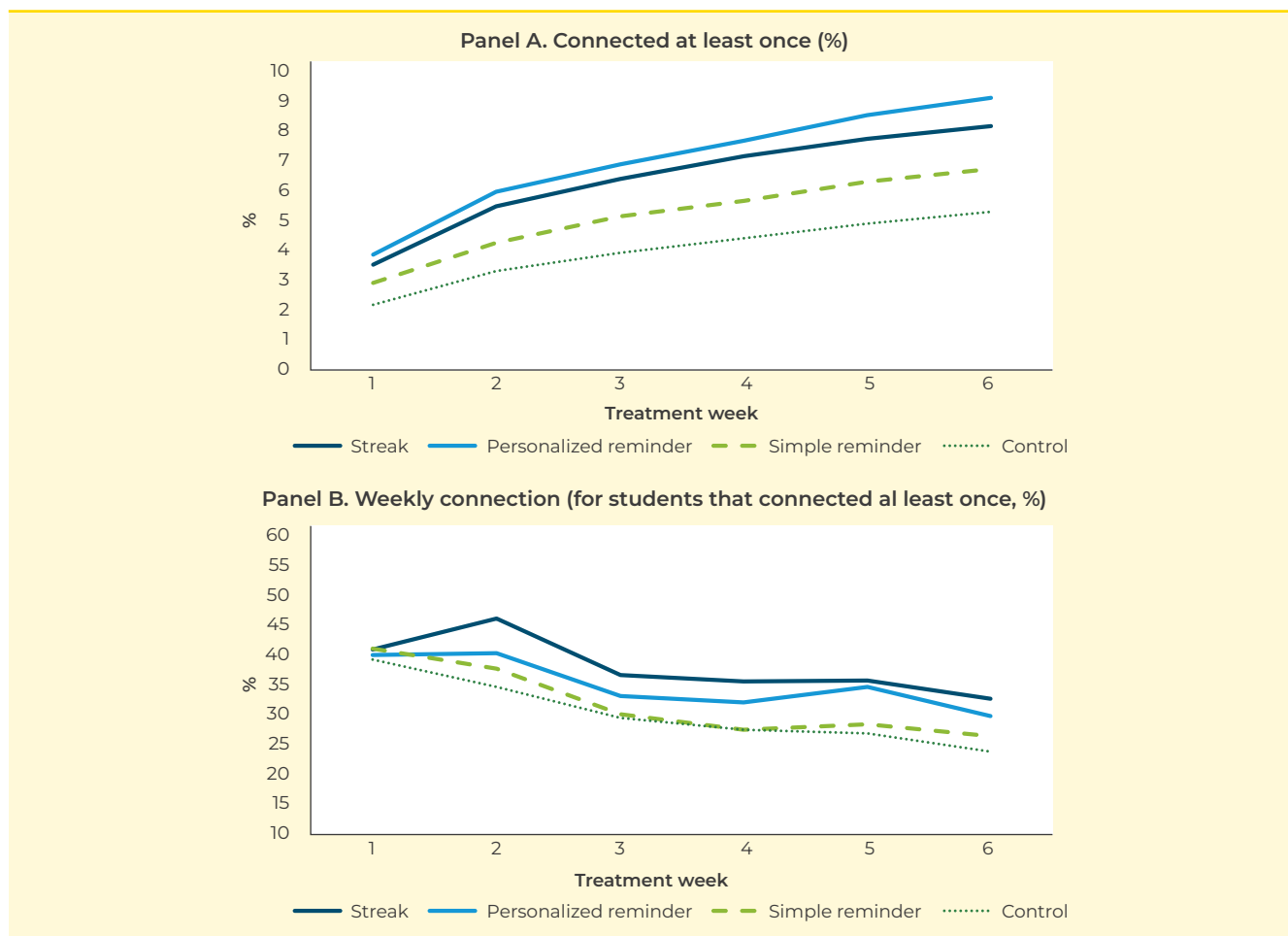
#### Key Concept

### STREAKS



Consecutive behaviors tracked and highlighted to encourage sustained effort, often linked to psychological motivations like loss aversion and consistency.

**FIGURE 1. Effects on Platform Use per Treatment Week**



Notes: Panel A presents the fraction of students who connected at least once since the start of the experiment by treatment week for each treatment arm. Panel B displays the fraction of students who connected to the platform in a particular week including only students who connected at least once during the six-week treatment period for each treatment arm.

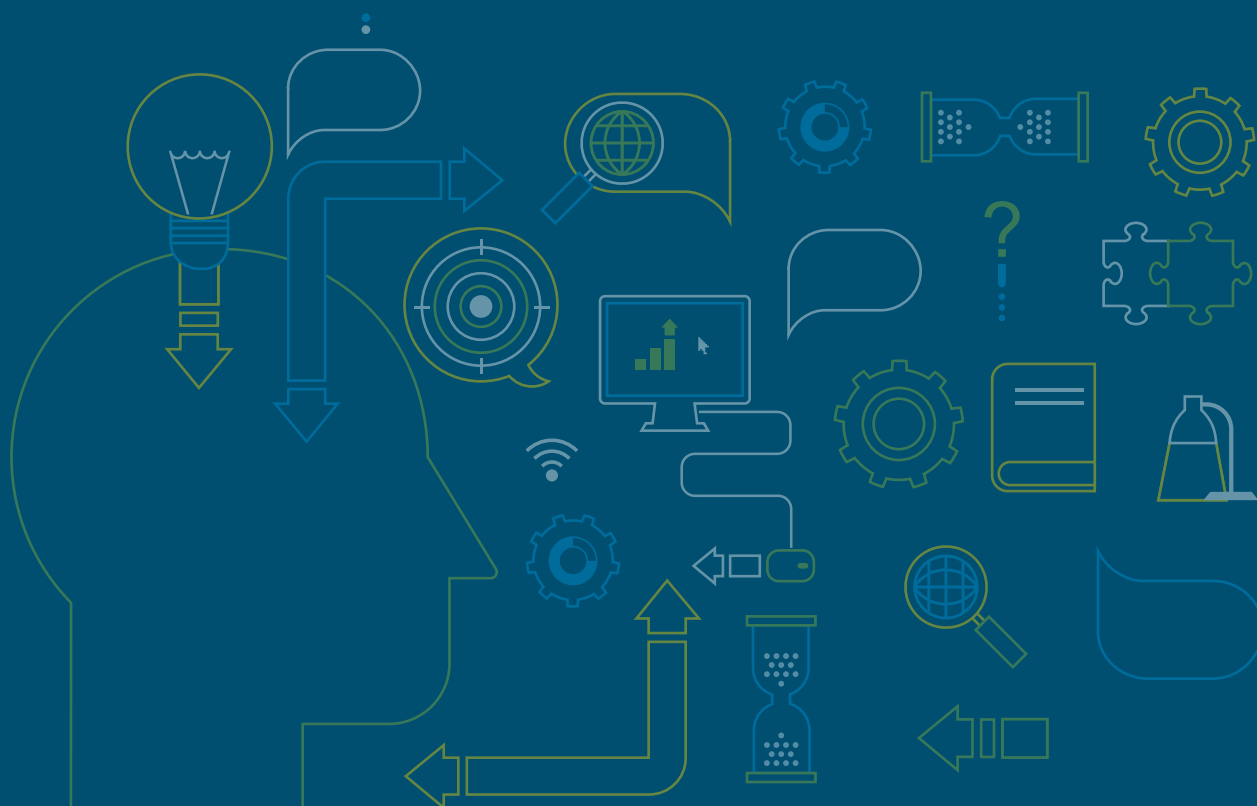
### FULL STUDY

Aulagnon, Raphaëlle, Julian P. Cristia, Santiago Cueto, and Ofer Malamud. 2024. "Streaking to Success: The Effects of Highlighting Streaks on Student Effort and Achievement." IDB Working Paper No. 1566. Washington, DC: Inter-American Development Bank. <https://doi.org/10.18235/0012912>.



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