

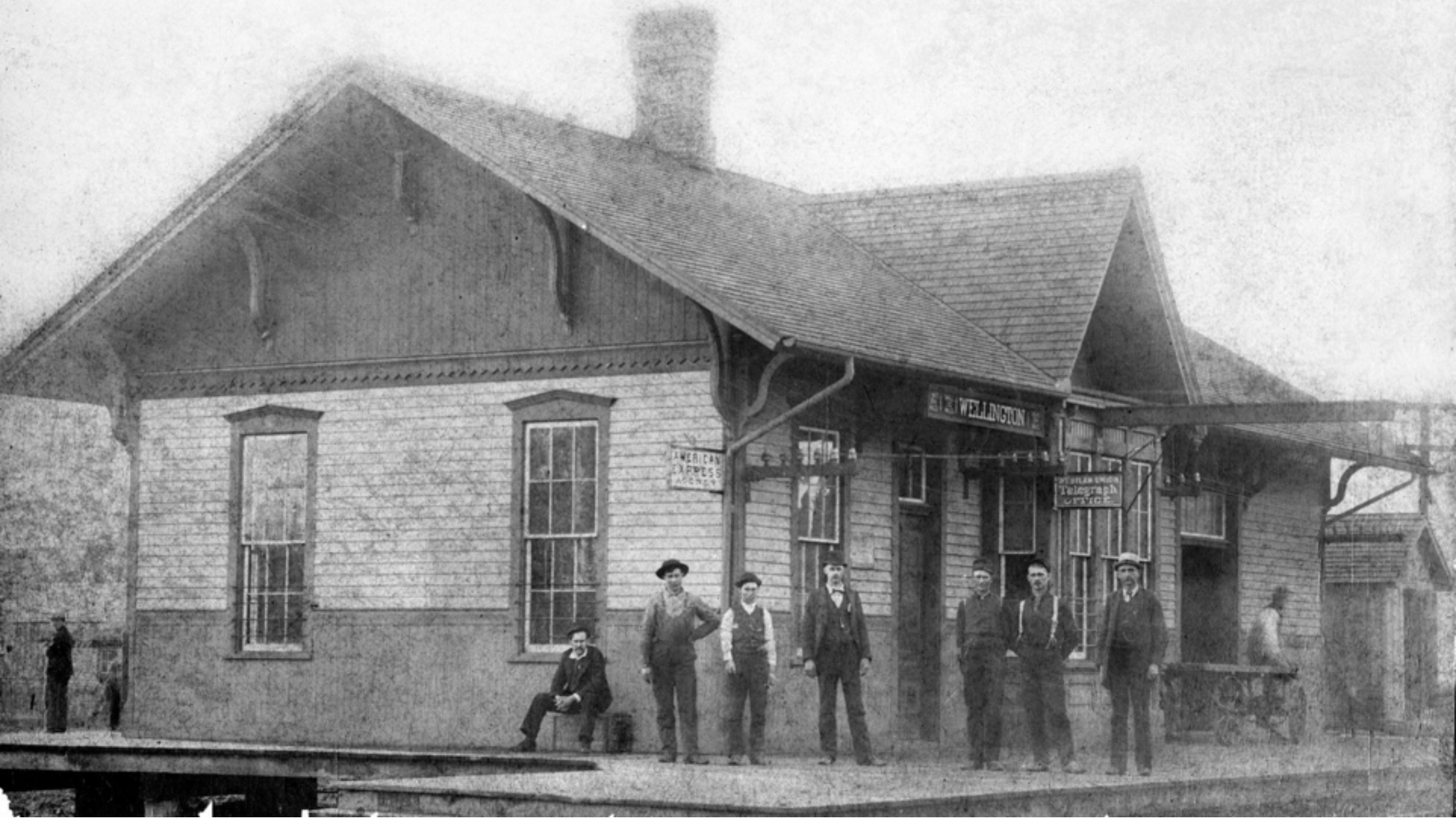
Clicking into Place Harnessing Learning Data for Practical Classroom Improvement



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Celebration of Teaching and Learning Symposium
University of Southern Indiana
Wednesday, February 14, 2024

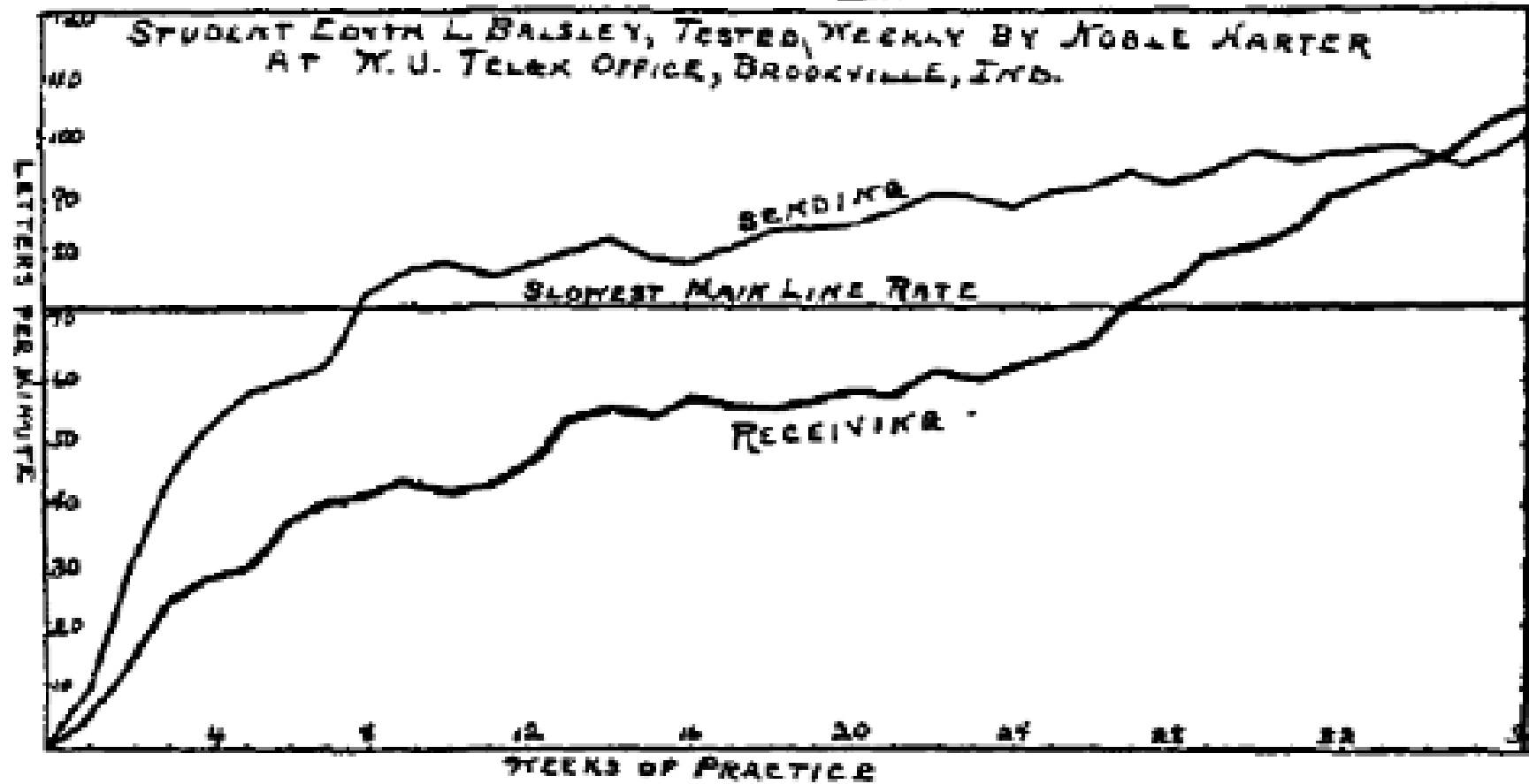


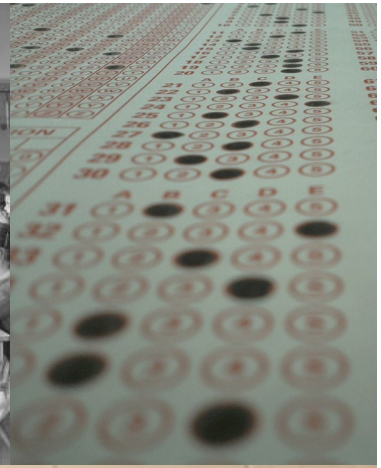
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TELEGRAPH OFFICE

FIG. IX.





Clicks



trace data from digital learning platforms

Number of actions performed in site

Access of learning materials

Sequence of navigation events

Assignment submissions

Total time spent on tasks/pages

Number of web sessions

Web session duration

Number of links viewed

Number of messages/posts composed

Number of messages/posts read

Regularity of study bouts

Time between submission and deadline

...

- J. Quick, B. Motz, J. Israel, J. Kaetzel. 2020. What college students say, and what they do: Aligning self-regulated learning theory with behavioral logs. LAK'20
- B. Motz, J. Quick, N. Schroeder, J. Zook, M. Gunkel. 2019. The validity and utility of activity logs as a measure of student engagement. LAK'19
- M. Guthrie, Z. Chen. 2020. Adding duration-based quality labels to learning events for improved description of students' online learning behavior. EDM'19
- A. Cicchinelli, E. Veas, A. Pardo, V. Pammer-Schindler, A. Fessler, C. Barreiros, and S. Lindstädt. 2018. Finding traces of self-regulated learning in activity streams. LAK'18
- R. Conjin, C. Snijders, A. Kleingeld, and U. Matzat. 2017. Predicting student performance from LMS data: A comparison of 17 blended courses using Moodle LMS. IEEE Transactions on Learning Technologies, 10, 1, 17-29.
- F. Okubo, T. Yamashita, A. Shimada, and H. Ogata. 2017. A neural network approach for students' performance prediction. LAK'17
- J. W. You. 2016. Identifying significant indicators using LMS data to predict course achievement in online learning. The Internet and Higher Education, 29, 23-30.
- C. Brooks, C. Thompson, and S. Teasley. 2015. Who you are or what you do: Comparing the predictive power of demographics vs. activity patterns in massive open online courses (MOOCs). L@S'15
- S. Joksimović, D. Gašević, T. M. Loughin, V. Kovanović, and M. Hatala. 2015. Learning at distance: Effects of interaction traces on academic achievement. Computers & Education, 87, 204-217.
- T. Yu and I.-H. Jo. 2014. Educational technology approach toward learning analytics: Relationship between student online behavior and learning performance in higher education. LAK'15
- L. V. Morris, C. Finnegan and S.-S. Wu. 2005. Tracking student behavior, persistence, and achievement in online courses. The Internet and Higher Education, 8, 3, 221-231.

...

Engagement, Motivation, Time Management,
Metacognition, Belonging, Reflection



Student
Activity

— ***Ha!*** —

Student
Performance
and Grades



Instructional Design, Social Support, Goal Orientation,
Alignment with Values, Technology Access,

Can we use clicks
to improve student outcomes?

Heck yea.

$$\frac{\text{Assign. Submits} - \text{Assign. Due}}{\text{Assign. Due}} + \frac{\text{Active Time}}{\text{Assign. Due}}$$

↓
 score and sort 1st year students
 every other week

↓
 academic advisors send
 proactive message to bottom quartile

↑
+0.3 grade point in term GPAs
+18% persistence to next year

Student Population	Suggested Email Message
Flagged for First Time	Hi [First Name]: I got a report that you might not be spending enough time in Canvas or might have missed some deadlines on your Canvas assignments. Things can get stressful with courses, but I know you can be successful this semester! Can we meet this week or next so we can discuss further? Yeah, I'd like to check-in. [hyper-linked to appointment scheduling system]
Flagged for Second Time	Hi [First Name]: I wanted to check in again and make sure that everything is still going well with your courses. It can be easy to start getting behind on coursework, but I know you can be successful this semester. Let me know if you want to talk this week or next. Yeah, I want to meet. [hyper-linked to appointment scheduling system]
Students Flagged All Three Rounds	Hi [First Name]: I'm really concerned and want to check in with you. I know this has been a strange and stressful semester with mostly remote learning and you might feel disconnected from your classes and the campus. There's still time to take advantage of some options to be successful in your current courses or to consider some alternate options and protect your GPA. Can we talk this week or next? [hyper-linked to appointment scheduling system]

What can a teacher do?

**Assignment due
reminders**

Positive
feedback

Motivation and
social norms



College today is nothing like
what you or I experienced

75.9 graded assignments with
due dates each term

5.06 each week

Missing assignments is the #1
risk factor for failure and
withdrawal



reminder



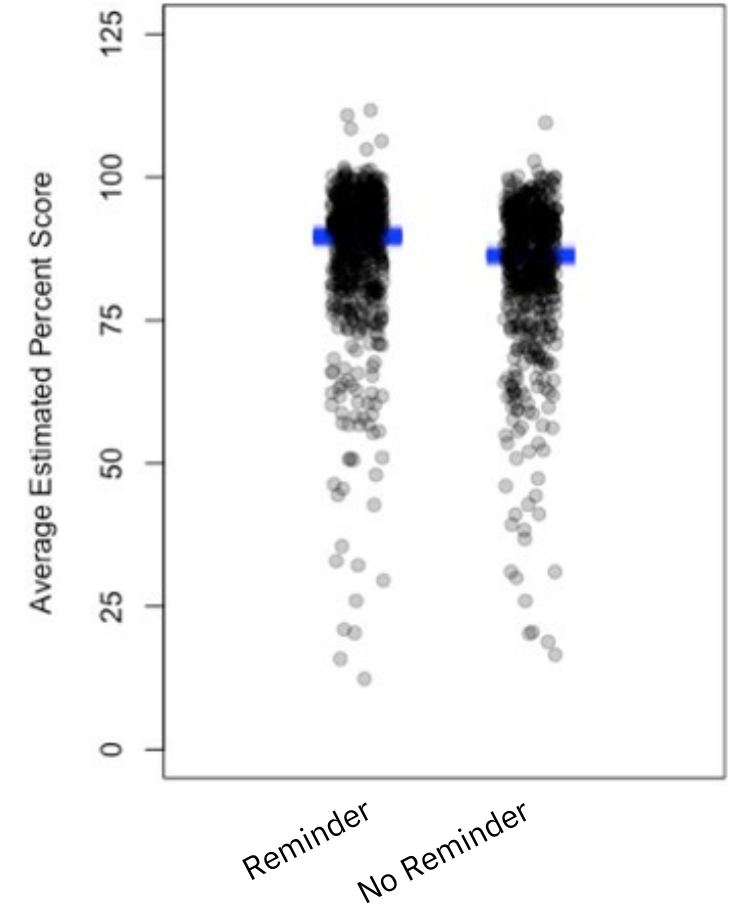
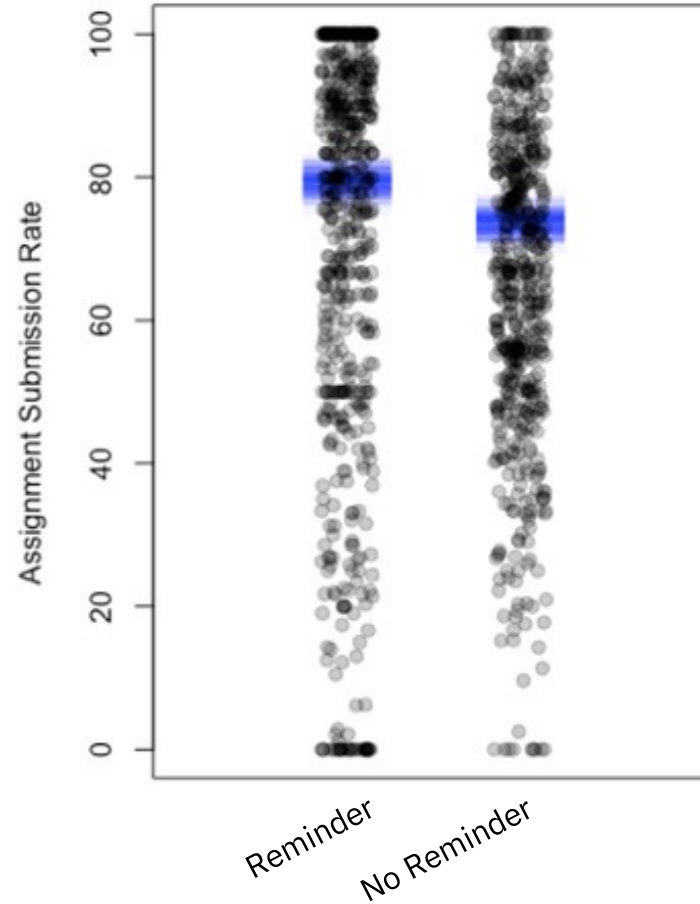
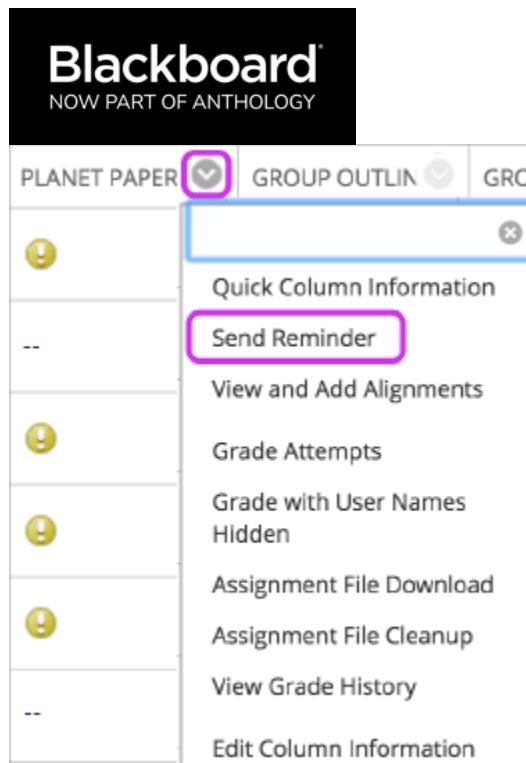
Bad outcomes

Assignment
Deadline



Assignment Reminder

The due date is approaching for Planet Paper, 2/14, 5pm
Time from now: 3 hours



6% increase in submission rate
3.5% increase in course grades

Assignment due reminders

**Positive
feedback**

Motivation and social norms

We're sending reminders when students are about to miss an assignment deadline.

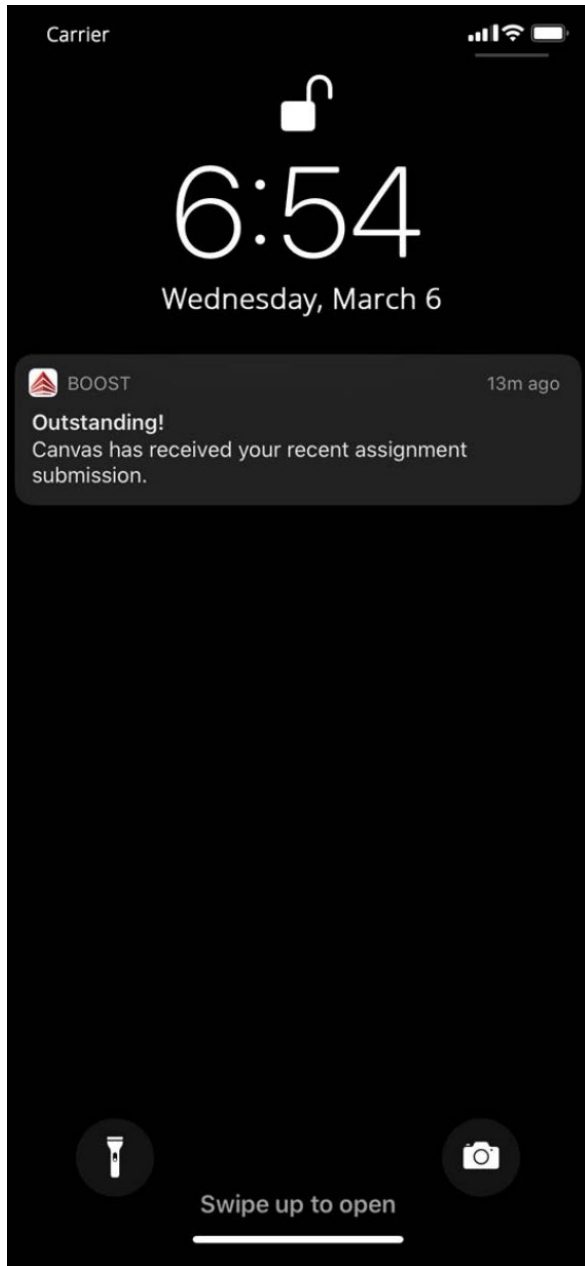
Why not also give positive feedback when students submit their assignments on time?

Important distinction:

- 👎 Praise directed at the person (“Good boy” or “Good girl”)
- 👍 Praise directed at the task (“Good work” or “Good job”)

Generic praise can be effective when it's difficult to evaluate your own performance

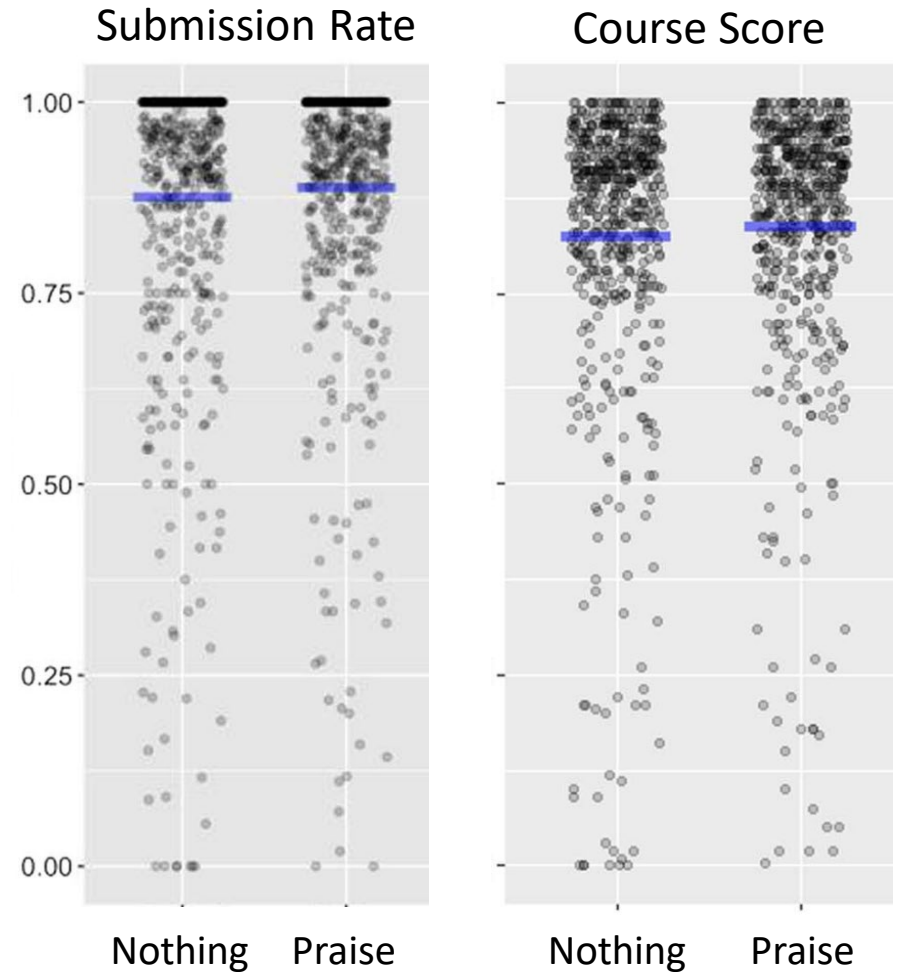
Ilgen, D. R., Fisher, C. D., & Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *Journal of Applied Psychology*, 64(4), 349–371.



← 6x

You did it!
Great job!
Excellent work!
Way to go!
Booyah!
High-five!
Outstanding!
Keep it up!
Well done!
Terrific!
Looking good!
Fantastic!
You're doing great!
You're on the ball!
Thumbs up!
Fist bump!
Top-notch work!
Nailed it!
Nice job!
Awesome!

Motz, B., Canning, E., Green, D., Mallon, M., & Quick, J. (2021). The influence of automated praise on behavior and performance. *Technology, Mind, and Behavior*, 2(3).



+5% students with submission rates above 75%

+3% students with final scores above 60%

Assignment due
reminders

Positive feedback

**Motivation and
social norms**

* with Julie Eyink!

You **should** never hesitate to drop me a note. You **should** consider getting involved in Psychology research. You **should** be taking notes in the eText. You **should** probably be wrapping up Lesson 1.2 before you go to sleep tonight. You **should** use the study guide to help you review topics. You **should** schedule your Unit 2 quiz in Examy right now. You **should** be doing Lesson 3.1. You **should** probably check out the Unit 3 reflection assignment. In the meantime you **should** be working on Lesson 3.4. You **should** also take a moment to think about your grade standing in P101 so far. If you haven't finished your experiment participation requirement, you **should** sign-up for some studies and get closer to earning those 4 credits. If you haven't already scheduled your Unit 4 quiz in Examy, you **should** totally do it. If there's anything that doesn't seem to be working right, you **should** contact Misti Bennett, the subject pool coordinator. And you **should** also be thinking about what you'll submit for the Unit 4 reflection assignment. Now that we're squarely in the second-half of the semester (just six weeks left!), you **should** make sure you've got all 4 credits. Right now you **should** be working on Lesson 5.2, a deep dive into the current state of what we know about memory. Set aside some extra time to work through this lesson carefully -- this is some hardcore stuff. If you haven't already, you **should** dive in to Lesson 6.1 (and maybe even schedule your Unit 6 quiz in Examy!). If you haven't already, please schedule your Unit 6 Quiz in Examy! For the Unit 6 reflection assignment, you **should** basically write a short experiment proposal. Right now you **should** be working on Lesson 7.1...

Injunctive Norm

What is commonly approved

- + behaviors aimed at gaining social approval

Performance Goals

Demonstrating competence

Jacobson, R. P., Mortensen, C. R., & Cialdini, R. B. (2011). Bodies obliged and unbound: Differentiated response tendencies for injunctive and descriptive norms. *Journal of Personality and Social Psychology, 100*(3), 433-448.

Descriptive Norm

What is commonly done

- + behaviors that are personally-desirable and advantageous

Learning Goals

Developing competence

Harackiewicz, J. M., & Elliot, A. J. (1993). Achievement goals and intrinsic motivation. *Journal of Personality and Social Psychology, 65*(5), 904-915.

Injunctive Norm Message

Dear «Kevin»,

I wanted to send you an update about your work in P101.

During the last unit (Unit «2»), you did the lesson activities «38» times prior to the quiz, but **«it's recommended that students should've done them»** about «72» times (roughly 3 times per activity) during the same time frame.

You can do the lesson activities as many times as you want, and we'll only record your highest score prior to the deadline. You can also work on the lesson activities after the deadline for studying. By doing these activities more frequently, you'll become more familiar with the P101 concepts, and you'll do better on future quizzes. If you're interested to talk more about this, or other ways to improve in P101, I'd be happy to meet with you. Just let me know.

The new unit of P101, Unit «3», is all about «Neuroscience». In this unit, **«we'll go on an introductory odyssey into the brain, exploring everything from the history and philosophy of neuroscience, to neurophysiology and neuroanatomy, and right up to neuroscience research methods and genetics.»** Please remember to schedule your Unit «3» quiz in ProctorU as soon as possible.

Sincerely,
Ben

Descriptive Norm Message

Dear «Jack»,

I wanted to send you an update about your work in P101.

During the last unit (Unit «2»), you did the lesson activities «38» times prior to the quiz, but **«the other students in your class did them an average of»** about «72» times (roughly 3 times per activity) during the same time frame.

You can do the lesson activities as many times as you want, and we'll only record your highest score prior to the deadline. You can also work on the lesson activities after the deadline for studying. By doing these activities more frequently, you'll become more familiar with the P101 concepts, and you'll do better on future quizzes. If you're interested to talk more about this, or other ways to improve in P101, I'd be happy to meet with you. Just let me know.

The new unit of P101, Unit «3», is all about «Neuroscience». In this unit, **«we'll go on an introductory odyssey into the brain, exploring everything from the history and philosophy of neuroscience, to neurophysiology and neuroanatomy, and right up to neuroscience research methods and genetics.»** Please remember to schedule your Unit «3» quiz in ProctorU as soon as possible.

Sincerely,
Ben

Control Message

Dear «Martin»,

I wanted to send you an update about P101.

The new unit of P101, Unit «3», is all about «Neuroscience». In this unit, **«we'll go on an introductory odyssey into the brain, exploring everything from the history and philosophy of neuroscience, to neurophysiology and neuroanatomy, and right up to neuroscience research methods and genetics.»** Please remember to schedule your Unit «3» quiz in ProctorU as soon as possible.

Sincerely,

Ben

(also a No Email
condition)

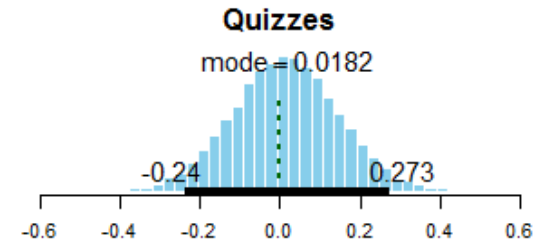
Subject for all emails:
P101 and the Lesson Activities

Three online P101 sections, 751 students

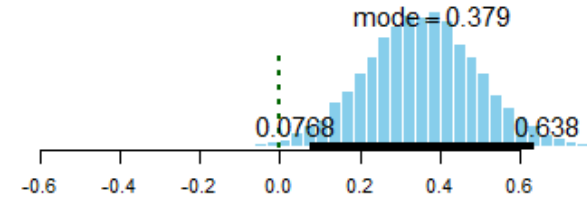
Which normative message is better for student learning?

Eyink, J. R., Motz, B. A., Heltzel, G., & Liddell, T. M. (2020). Self-regulated studying behavior, and the social norms that influence it. *Journal of Applied Social Psychology, 50*(1), 10-21.

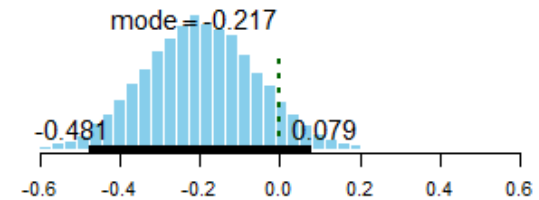
Injunctive



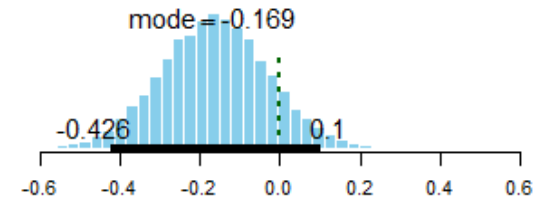
Descriptive



Control



No Email



Deviation from Mean
Change over Unit 2 Quiz Score

What are your students doing?
How are they studying?
How are they engaging with materials?



- Use “clicks” to identify students who might benefit from support
feedback
clarity about norms

Thank you.

bmotz@indiana.edu

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