U-Pace Instruction: Replication of Greater Academic Success and Greater Learning across Disciplines and at Adopting Universities

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U-Pace Instruction Was Designed to Foster Students Sense of Control Over Learning

Research has shown that individuals who perceive control

- achieve more and experience better psychological outcomes
- students who feel a deepened sense of control over their learning may show increased persistence in the face of academic challenges.

- The mastery requirement focuses students on learning small, manageable amounts of material at one time; and consecutively mastering each content module strengthens the link between effort and positive outcome, building a sense of control over learning.
- The self-paced format of U-Pace allows students to determine when, and at what rate (within a semester), they engage the material.
- Amplified assistance messages facilitate students’ perceived control over learning by communicating an unwavering belief in students’ ability to succeed even if unsuccessful at the moment.
U-Pace’s Components Combine to Produce Greater Student Learning
RCT in Psychology (n=960)

Two Instructors each taught all 4 instructional conditions:

- **U-Pace instruction** – integrates Amplified Assistance + Mastery-based learning online
- **Amplified Assistance component only** (AA)
- **Mastery-based Learning component only** (MB)
- **Conventional instruction** (F2F)

- Instructors were trained in each instructional approach and followed an implementation manual
- Fidelity to instructional condition was carefully monitored throughout the semester
- Course content and textbook were held constant

![Bar chart showing students' performance on proctored cumulative exam by instructional method and disadvantaged status](chart.png)
Methods for Assessment of Learning

**Student Learning:** Assessed at the conclusion of the course using cumulative, multiple-choice exam measuring deep understanding of core concepts.

- Exams, constructed with Bloom’s Revised Taxonomy, required students to apply or integrate concepts rather than recall facts.

- Randomly selected students (> 50% from each condition) took the cumulative exam in a proctored classroom and were motivated to perform their best.

- Students’ scores on the cumulative exam did not count toward their final course grades.
U-Pace Produced Greater Learning
(Other Instructional Conditions did not differ from One Another)

• **U-Pace students scored approximately 6 percentage points higher** on the proctored cumulative exam than students in Amplified Assistance only, Mastery-based Learning only, or conventional instruction.

• There were no differences between U-Pace students and students in Amplified Assistance only, Mastery-based Learning only, or conventional instruction that could explain the greater learning.

• **U-Pace disadvantaged students** (lighter green bar) significantly outperformed the not disadvantaged students from the other instructional conditions.

• Disadvantaged students:
  - eligible for Pell grants or racial/ethnic minority students showing gaps in graduation
  - stratified during random assignment

![Graph showing Students' Performance on Proctored Cumulative Exam by Instructional Method and Disadvantaged Status]
U-Pace’s Greater Learning Replicated in a Second Discipline (Sociology)

Similar to the findings in the psychology RCT, the U-Pace sociology students significantly outperformed the conventionally taught sociology students by approximately 10 percentage points on a cumulative exam measuring deep understanding of core concepts.

- The exam was constructed with Bloom’s Revised Taxonomy and required students to apply or integrate concepts rather than recall facts.

- Randomly selected students (> 50% from each condition) took the cumulative exam in a proctored classroom and were motivated to perform their best.
Similar to the findings in the psychology RCT, a significantly greater percentage of U-Pace sociology students earned a final course grade of A or B compared to the conventionally taught sociology students.

- Two instructors each taught both instructional conditions.
- Instructors were trained in each instructional approach, followed an implementation manual, and fidelity was carefully monitored.
- All grades were objectively determined.
- Course content and textbook were held constant.

There were no differences between the U-Pace and conventionally taught students that could explain the greater academic success produced by U-Pace instruction.
Both U-Pace low-income and not low-income students did significantly better than the conventionally taught not low-income students at the adopting university.

- Low income defined as eligible for Pell grants.
- All grades were objectively determined.
- The instructor was trained in each instructional approach, and followed an implementation manual.
- Fidelity to instructional condition was carefully monitored throughout the semester.

No differences were found between groups that could explain the greater academic success produced by U-Pace instruction.
Conclusions

- U-Pace instruction **consistently produced greater academic success and greater learning** than conventional instruction.

- Preliminary evidence from adopting universities **supports the scalability of U-Pace instruction.**
  - U-Pace instruction can be implemented in virtually all institutions.
  - U-Pace requires only a learning management system to monitor student behavior (number of quiz attempts and scores).

- The **replication of student outcomes across disciplines and universities, and the convergence of findings**—institutional records indicating greater academic success for all students, and performance measures demonstrating greater learning—**strongly suggests that U-Pace instruction holds promise for higher education.**
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