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RESEARCH BRIEF 2

Online Credit Recovery: Initial Findings for Algebra 1

Jordan Rickles | Peggy Clements | Iliana Brodziak de los Reyes | Emily Collins | Linda Lin | Jessica Heppen

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About this research brief

This research brief is the second in a series of briefs for the *Online Credit Recovery Study*. In the first brief, we provided an overview of the study and described the online learning model tested. In this brief, we highlight key findings about implementation and initial outcomes for Algebra 1 credit recovery classes.[1]

Study overview

The study compares an online learning model for credit recovery to the more typical teacher-directed credit recovery model. The online learning model implemented for the study included an online curriculum provided by a vendor and credentialed in-class teachers provided by the participating schools. The in-class teachers could provide individualized support and supplement the digital instruction.

To estimate the effectiveness of the online learning model, we compared the online classes to teacher-directed classes at each study school. We used a lottery process to determine whether each student enrolled in their school's teacher-directed class or a class that used the online learning model.

Key Findings for Algebra 1

- Two features of personalized instruction—individualized pacing and performance feedback—were more common in the online classes than in the teacher-directed classes, but two other instructional features were not significantly different in the two types of classes.
- Student use of the online program, in hours spent and content completed, fell below expectations.
- Student engagement and other instructional experiences were similar in the online and teacher-directed classes.
- Student performance on an algebra test was not significantly different in the online and teacher-directed classes.
- Student credit recovery rates were not significantly different in the online and teacher-directed classes.
- The findings contrast with a common public perception that students learn less in online courses and the courses are easy to pass.

This random assignment approach allows us to draw valid conclusions about how differences between the two types of classes affected student experiences and outcomes. All classes were in the Los Angeles Unified School District and took place in a standard high school classroom during the district's 5-week summer session.

The analyses for this brief focus on students who failed Algebra 1 during their first year of high school and retook the class during the summer before their second year of high school (see Figure 1).[2]

Figure 1. Number of Study Participants for the Algebra 1 Summer Classes

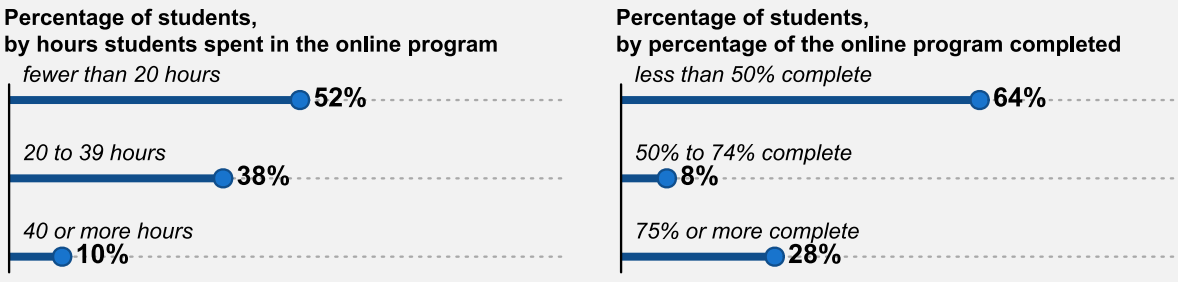
Note. The study took place during the 2019 summer term for Algebra 1.

For results on English 9 credit recovery, please see Brief 3 in this series. More information about the study's design and methods are available in Brief 1 and in a technical supplement.

Student use of the online program was lower than expected

A critical feature of the online learning model is that students use an online program to work through the course content at their own pace. Although there are no formal guidelines for time spent in the online program, the online course provider (Edgenuity) suggested that most students should spend at least 40 hours working through the material to complete the course during the 5-week summer session. However, only 10% of students assigned to an Algebra 1 online class spent at least 40 hours working in the online program (see Figure 2). Similarly, few students (28%) completed at least 75% of the online course content.

Figure 2. Number of Hours Students Spent in the Online Program and Percentage of Online Program Completed



Note. Based on 305 students assigned to an Algebra 1 online class. Approximately 88% of the students assigned to an online class accessed the online program at least once.

Two of four features of personalized instruction were more common in online classes than in teacher-directed classes

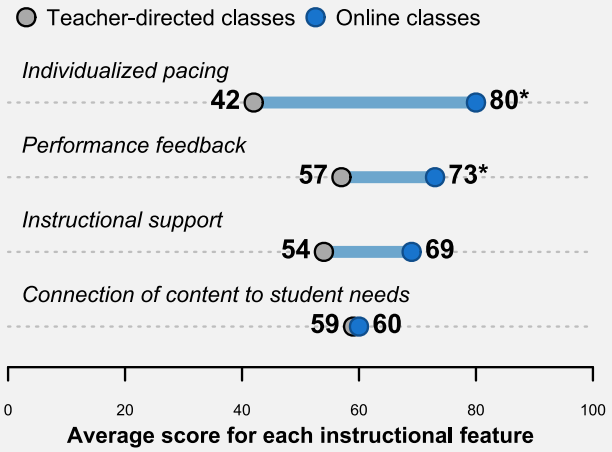
We expected the online classes, which combined the online program and in-class teacher support, would provide a more personalized instructional environment than the teacher-directed classes. To examine this hypothesis, we asked teachers a series of survey questions about four instructional features that can facilitate a personalized instructional environment: (1) individualized pacing, (2) opportunities to provide performance feedback, (3) instructional support, and (4) the connection of course content to student needs.

Based on the teacher responses, we assigned classes a score between 0 and 100 for each feature. A score of 50 represents the average response across all credit recovery classes in the study.[3] A higher score for a class means that the instructional feature was more common than in other classes.

Two of the four instructional features were significantly more common, on average, in online classes than in the teacher-directed classes (see Figure 3).

Specifically, the individualized pacing score was 38 points higher in the average online class than in the average teacher-directed class (equivalent to about a one standard deviation difference), and the performance feedback score was 16 points higher (about a 0.4 standard deviation difference). The other two features, instructional support and connection of content to student needs, were not statistically different in the online and teacher-directed classes, on average.

Figure 3. Relative Prevalence of Instructional Features in the Online and Teacher-Directed Algebra 1 Classes



Note. Based on 14 online classes and 14 teacher-directed classes. The averages displayed for the online classes are the calculated means. The averages displayed for the teacher-directed classes depict the estimated average difference between online and teacher-directed classes.
* Average difference between the online and teacher-directed classes is statistically significant ($p < .05$).

Teachers of the online and teacher-directed classes used slightly different grading criteria

We also asked teachers how they calculated students' final grades to see if grading criteria differed in the two types of classes. Teachers of the online and teacher-directed classes placed similar emphasis on tests and quizzes, but differences existed in the emphasis teachers placed on class assignments (worth 15% versus 29%, respectively, of the final grade) and behavior-related criteria (worth 24% versus 10% of the final grade, respectively; not statistically different).

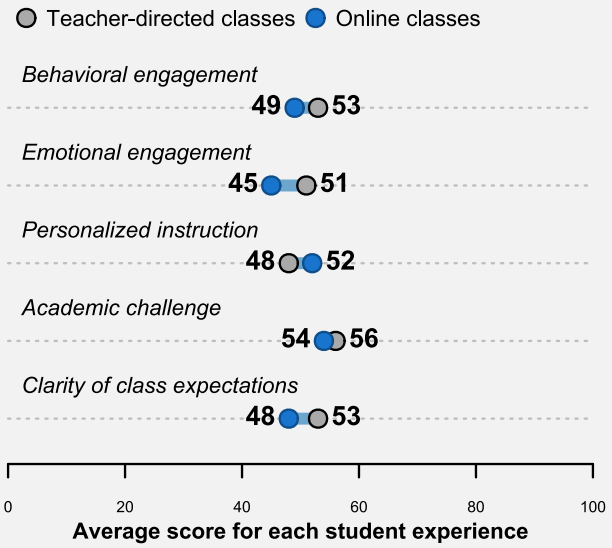
Students reported similar instructional experiences in the online and teacher-directed classes

We expected differences in the instructional features of online and teacher-directed classes to translate into differences in students' experiences in those classes. To examine student experiences in their credit recovery class, we asked them a series of survey questions toward the end of the term. These questions addressed their perceptions of (1) behavioral engagement, (2) emotional engagement, (3) personalized instruction, (4) academic challenge, and (5) the clarity of class expectations.

Based on the student responses, we assigned students a score between 0 and 100 for each experience, with an average score of 50 across all students in the study. A higher score means that the student thought the experience was more pronounced than did other students.

On average, students reported similar instructional experiences in the online and teacher-directed classes (see Figure 4).

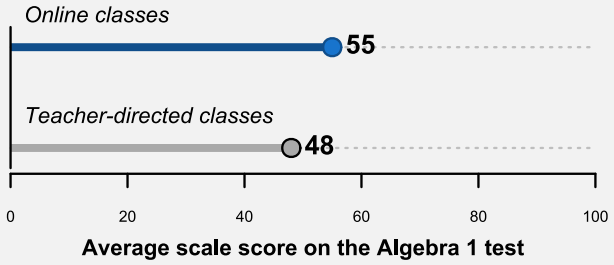
Figure 4. Relative Level of Student Experiences in the Online and Teacher-Directed Algebra 1 Classes



Note. Based on 305 students assigned to online classes and 308 students assigned to teacher-directed classes. The averages displayed for the online classes are the calculated means. The averages displayed for the teacher-directed classes depict the estimated average difference between online and teacher-directed classes. Average differences between the online and teacher-directed classes are not statistically significant.

Students in the online and teacher-directed classes had similar performance on an algebra test

Figure 5. Average Test Score for Students in the Online and Teacher-Directed Algebra 1 Classes



Note. Based on 305 students assigned to online classes and 308 students assigned to teacher-directed classes. The averages displayed for the online classes are the calculated means. The averages displayed for the teacher-directed classes depict the estimated average difference between online and teacher-directed classes. The average difference between the online and teacher-directed classes is not statistically significant.

To measure students' content knowledge at the end of the Algebra 1 credit recovery class, we administered an Algebra 1 test developed for the study.

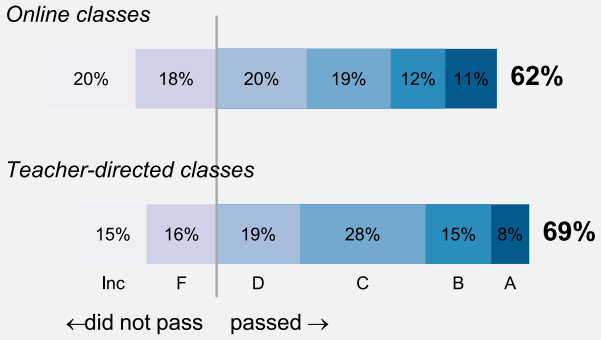
Based on the student test answers, we assigned students a scale score between 0 and 100, with an average score of 50 across all students in the study. A higher score indicates that the student performed better on the test than students with lower scores.

Students assigned to the online classes scored 7 points higher, on average, than students assigned to the teacher-directed classes (see Figure 5). This represents a modest difference in course content knowledge (a 0.18 standard deviation difference) but is not statistically significant.[4] In addition, in both the online and teacher-directed classes, students answered only about a third of the test questions correctly, on average.

Students in the online and teacher-directed classes had similar credit recovery rates

About two out of three students in the online and teacher-directed classes recovered the Algebra 1 course credit by receiving a grade of D or higher (see Figure 6). The credit recovery rate was a little lower for students assigned to the online classes (62% versus 69%), but this difference was not statistically significant.

Figure 6. Percentage of Students in the Online and Teacher-Directed Algebra 1 Classes, by Final Course Grade



Note. Based on 305 students assigned to online classes and 308 students assigned to teacher-directed classes. Students who did not receive a final course grade (e.g., dropped the course) are counted as not recovering credit and are represented in the graph as an incomplete (Inc).

Implications

The Algebra 1 findings do not paint a clear picture about the relative effectiveness of online credit recovery classes but do inform the discourse about online credit recovery and have implications for future research.

Although the teacher survey results hint at the idea that the online classes provided a more personalized instructional environment—in terms of course pacing and performance feedback—neither the remaining instructional features (instructional support and connection of content to student needs) nor students' self-reported experiences in the course bear out this finding. Furthermore, students in the online and teacher-directed classes demonstrated similar content knowledge and had similar credit recovery rates.

The findings are in contrast to a common public perception that students learn less in online courses and the courses are easy to pass. The findings suggest that an online Algebra 1 course, when implemented in school with a certified teacher, likely provides students with educational experiences similar to those they would get from a more typical teacher-directed credit recovery class.

Next steps

In this brief, we presented initial results for a comparison of online and teacher-directed Algebra 1 summer credit recovery classes. In future briefs, we will dig deeper to provide a richer understanding of how online credit recovery affects student educational outcomes. For example, we will address the following questions in future briefs:

- Are there certain types of students for whom online credit recovery may be particularly beneficial?
- Are there certain instructional conditions that help facilitate the effectiveness of online credit recovery?
- What is the impact of being assigned to online credit recovery on students' longer-term high school performance, including on-time graduation?

By addressing questions like these, we hope to add important details to the complicated credit recovery landscape.

Notes

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[2] Students classified with an English language development (ELD) level of 1, 2, or 3 (out of 5) were excluded from the study. Per district policy, students with an ELD level below 4 should not be enrolled in online courses. Students with an ELD level of 4 or 5 were allowed to participate in the study.

[3] Although this brief focuses on Algebra 1 credit recovery classes during the 2019 summer term, the study included Algebra 1 classes during the 2018–19 school year and English 9 classes during the 2018 and 2019 summer and the 2018–19 school year. Measures reported on the 0 to 100 scale are relative to all classes (or students) in the study and not just those classes (or students) in the Algebra 1 summer term.

[4] The finding about student performance on the algebra test is sensitive to how we handle missing test score data in the analysis (missing for 34% of the students). Across different approaches to handling missing data, the estimated average test score difference between students in the online and teacher-directed classes was consistently positive, but the magnitude and statistical significance of the difference varied across methods.

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1000 Thomas Jefferson Street NW
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