Evaluation of Prodigy: Key Findings

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The Center for Research and Reform in Education (CRRE) at the Johns Hopkins University conducted a mixed-methods evaluation of Prodigy in a mid-sized, suburban school district in the southern United States. The purpose of the study was to explore implementation of Prodigy and the student and teacher impacts associated with implementation. This brief provides an overview of findings from the evaluation. For more details, please reference the full technical report.

METHOD

The study employed a correlational mixed-methods evaluation design with a case-study approach for presentation of qualitative findings. The rationale was to (a) collect evidence that can help explain outcomes such as teacher and student attitudes, experiences, and implementation fidelity at different schools; (b) have outcomes other than student achievement for both descriptive and comparative analyses; and (c) gain firsthand impressions of the program implementation and application context. For the latter purposes, data collection involved site visits to two elementary schools in the district for one day each.

Participants

- 7 schools with 577 K-5 students
  - Predominately Hispanic (~50%) and white (~28%)
  - Two-thirds of students are economically disadvantaged
  - Between 61-83% of students met grade-level standards in all subjects in state testing in 2018 (well above state average)
- 10 teachers or teaching specialists
- 2 principals and one district administrator

Measures

- Classroom observations
- Teacher focus groups
- Student focus groups
- Interviews with school and district administrators
- Achievement data from the state mathematics exam (State of Texas Assessment of Academic Readiness; STAAR)

RESULTS

Administrators and teachers hold very positive perceptions of Prodigy, want to use the program in the future, and would recommend it to their peers.

Teachers, principals, and teaching specialists were emphatic regarding student enjoyment of the program and their engagement in mathematics content presented through Prodigy. Administrators appreciated the ability of teachers to "pull groups" while students used the program; teachers appreciated the ease of implementation and the extent to which students playing Prodigy *don't* need their teacher's attention. Prodigy, when used as part of station rotations, requires little effort by teachers to prepare and little of the teacher's attention while students are using it. Principals and teachers also consistently noted the utility of teachers' ability to modify the specific mathematics content students encounter in the game.

Administrators and teachers described training related to Prodigy as helpful and sufficient, and they were largely satisfied by the support provided by Prodigy Education during implementation.

Adult participants in the current study described Prodigy Education as responsive to and supportive of the professional development needs of teachers. Participants also indicated that teachers would benefit from further training, particularly related to using data and reporting features. A recommendation was made by the research team to Prodigy Education to leverage technology to provide teachers on-demand access to short and specific professional development options that enable teachers to use the product effectively.

Student engagement was consistently described as a key strength of the program and was generally married with students' preoccupation and independent learning.

Again, educators in the current study consistently noted increased student engagement in mathematics content when presented through Prodigy. Educators described students as focused and engaged with content that is both challenging and relevant. During observations, the research team observed students of all abilities, even students with limited English proficiency, remain engaged in the storyline of Prodigy. In focus groups, students nearly unanimously agreed that the program made learning mathematics easier and more fun. Students indicated that one of their favorite parts of Prodigy is the feeling of achievement or "leveling up." They especially like the social components—they like battling their friends, being in a virtual world with their classmates, and knowing that others are playing with them when they are at home. We conclude that Prodigy certainly makes a positive contribution to students' attitudes toward mathematics, which are related to achievement in a meaningful way.

We did observe that students who consistently answered questions incorrectly were still able to move about the world, engage in battles, and sometimes presented with the exact same questions they previously answered incorrectly and were subsequently

given the answer to. Researchers and teachers noted the lack of remediation and actual teaching provided by Prodigy. A recommendation was made to Prodigy Education to increase the frequency and quality of remediation within the game and to notify teachers of students who struggle, as multiple data sources suggest that these students are not going to stop playing Prodigy to ask for help.

The research team found that, on average, increased use of the Prodigy program was significantly correlated with increased achievement gains for students on a standardized mathematics assessment.

After controlling for prior achievement and demographic characteristics, correlational analyses found a statistically significant positive relationship between fourth grade students' achievement gains on a standardized assessment and how extensively they used Prodigy. On average, each additional question students answered during the 2018-19 school year was associated with a statistically significant ($p < .05$) increase in assessment score of 0.00113 points. Furthermore, each additional question students answered *correctly* was associated with a statistically significant ($p < .05$) increase in assessment score of 0.00160 points. The relationship between the number of questions students answered at home and achievement gains was not significant. Our results indicate that a student would need to complete roughly 888 questions in the game in order to achieve a one-point gain in their standardized assessment score.

Findings also indicated that no significant difference in the achievement gains of student subgroups (i.e., ED, LEP, and baseline proficiency status) were observed based on their amount of Prodigy usage. Importantly, the subgroup analysis supports teachers' perceptions and firsthand observation regarding the remarkable accessibility of Prodigy to all students regardless of ability. And finally, findings suggest that the relationship between usage and achievement is not exactly linear. In other words, more and more usage of Prodigy may not result in more and more achievement. In the current study, no significant difference was observed in the adjusted average score of students in high- and mid-usage groups. Students in the high-usage group did not perform significantly better than students in the mid-usage group.

The most prominent criticism of the program was related to teachers' perceptions of a need for a time limit for students to shop, customize their avatar, or engage in other in-game distractions.

Our observations affirm that a small number of students in each school did appear to "wander about" the program. The research affirmed the recommendation made by teachers to Prodigy Education, to limit the amount of time students spend in non-content aspects of the game while playing in the school-based area of the game.