Education design study shows digital textbook impacts student engagement, achievement and motivation.
» Monroe Township High School Overview

Monroe Township district administrators sought to prepare their students for the 21st century global society. One initiative to meet that goal was to incorporate digital technology into the classroom. To test the hypothesis that digital technology could improve student outcomes, district administrators, high school biology teachers and Pearson conducted a research study to see just how effective digital textbooks are with students.

» Challenge

When Dr. Jeff Gorman, Assistant Superintendent of Schools at Monroe Township public school district in New Jersey first came into contact with the iPad® in 2010, he and his team saw the potential to use it as a learning tool. While they waited for digital educational tools to catch up with the new technology, the district continued to build awareness of one-to-one learning and how technology could personalize student learning and increase achievement in the district. Even in 2008 the Monroe Township stakeholders saw the potential for educational digital technology, and worked to ensure the new wings under construction and the existing portion of the high school were wired and equipped with the infrastructure to easily incorporate computer networks and connection to the internet.

In 2012, after researching options for interactive learning on iPads, Gorman and his team believed Pearson’s electronic textbooks on iBooks® was the best solution. To test their belief Gorman wanted to incorporate digital textbooks into the classroom and study the effects on student engagement, achievement and motivation. “A one-to-one iPad learning environment was our protocol to prepare all children to be college and career ready in the 21st century global society. One of many solutions would be to integrate digital textbooks on the iPads.” explains Gorman. To examine the effectiveness of digital textbooks on iBooks, in partnership, Pearson’s Product Design Research and Efficacy team, Gorman, and teachers conducted a research study at Monroe Township High School.
Solution

During the 2012-13 school year, the study was set up with two teachers in Biology classes of 9th and 10th grade students. The teachers were each asked to create two sections of students with comparable skill levels. One group of students was assigned Pearson’s Miller and Levine Biology digital textbooks on iBooks and the other group would continue to use the district’s standard print-based Biology textbook. The classes were taught in a block schedule with instruction and lab activities for 90 minutes every other day. Plus students conducted lab experiments every two weeks.

The instructors were trained to use all of the different features of the digital textbooks, including the study guides, chapter-end quizzes, videos, and interactivity. They used the digital Biology textbook 80% of the time and district resources the remaining 20% of the time in the test classrooms. In the print-based Biology textbook group, teachers used the print textbook as the main source for instruction as well as supplemental materials used to meet state curriculum standards. While these students already had access to iPads, they were only used to view videos and wiki sites set up by the teacher.

Results

“The students love it [Miller and Levine Biology] because it’s on their iPad, and they won’t lose it. They love the animations and simulations that come along with it. There are so many things not offered with a print textbook,” explained one biology teacher.

“The research study helped us so much because it uncovered the true potential of the tool,” said Gorman. To assess achievement, students took the Stanford Achievement Test – Version 10 (SAT10) at the beginning and end of the year. Students who used Pearson’s Miller and Levine Biology digital textbook significantly outperformed their peers who used the standard printed textbook by eight percentiles. In fact, the students who used the printed textbook did not show any gains on the post SAT10 from the initial SAT10 assessment (see Figure 1).

![Figure 1: Digital textbooks student achievement compared to print textbooks for Monroe students](image-url)
Results (continued)

In addition, student motivation was examined using a Biology Motivation Questionnaire (BMQ). Statistical analysis on the survey results revealed that students who used the printed textbooks showed a significant decrease in motivation by the end of the school year, while students who used the digital textbooks had BMQ scores that were similar pre- to post-test, thus showing no decrease in motivation. Another significant finding on the BMQ pertained to the number of days students missed classes. Students in both groups, on average, missed seven days during the school year. For students using print textbooks, as their number of days absent increased their motivation decreased. However, with students using the digital textbooks, there was no relationship between days missed and motivation score (see Figure 2).

Because of the interactivity, the built in dictionary and the ability to dig deeper in the digital textbooks, the English as Second Language students were able to excel. “Although there were only a few ESL students in the study, they achieved higher scores than not only their ESL peers, but also their non-ESL peers. It was fascinating. But it makes sense to me because they have to assimilate to this culture; they are working twice as hard,” said Gorman.

As a result of the success with the digital textbook based Biology course, administrators at Monroe Township High School have since implemented digital textbooks on iBooks in other classes including Algebra and Geometry.

For more information about Pearson’s digital textbooks on iBooks, visit pearsonschool.com/iBooks or visit the Apple iBooks store to purchase.