

Digital textbook analytics can predict student outcomes, study finds

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Reynol Junco reviews course material with students in his graduate course at Iowa State. Junco says digital textbook data can help him and other instructors predict student outcomes. Credit: Christopher Gannon

College professors and instructors can learn a lot from the chapters of a digital textbook that they assign students to read. Reynol Junco, an associate professor in Iowa State University's School of Education, says digital books provide real-time analytics to help faculty assess how students are doing in the class.

Junco and colleague Candrianna Clem collected data from 236 [students](#) using e-books in various classes at Texas A&M—San Antonio. On average, students spent nearly 7.5 hours reading over 11 days throughout the 16-week semester. Students who spent more time reading the textbook earned a higher grade in the course, according to the study, published in the journal *Internet and Higher Education*.

The conclusion may seem rather obvious. But it's the fact that instructors can unobtrusively track the time students spend reading that is significant, he said. Junco used his own class and teaching style as an example to explain why.

"If students are not reading the textbook, they're not getting the important material that they need. My lectures only cover the general ideas and then we do hands-on work in class," Junco said. "As an instructor, you don't really get a sense of how students are doing in a class until they turn in a graded assignment. With the analytics from a [digital textbook](#) I can know right away if students are struggling."

It's possible that some students simply aren't taking time to read the textbook. It can also depend on how the instructor incorporates the book into the class. However, if there are other reasons why students are not reading, such as the material is too complex for their reading level, the instructor can adapt course material or take other steps to help students succeed, Junco said. Researchers did control for the class type and level of difficulty as well as instructor teaching style.

Better indicator than past academic performance

Instructors generally use a student's high school or community college grade point average to identify if he or she may need academic assistance. Junco says GPA is a good indicator of academic performance, but it is also a broad, static measure. His research shows the data from digital textbooks is a much stronger predictor of student outcome than previous academic performance.

"Now we have an individualized measure of how well students will do in class," Junco said. "It's also a behavioral measure. We can use these behavioral and real-time data to make decisions about student performance, without clumping students into these categories of 'will succeed' or 'won't succeed.'"

The findings highlight a value that regular textbooks cannot offer, but adoption of e-books is far from universal in higher education, Junco said. The use of [digital books](#) is often driven by student preference, and not everyone is a fan. For the study, 307 students were offered digital textbooks, with the option to print the material, and 236 used the digital version exclusively.

The analytics can inform teaching style and emphasize the importance of reading to students. However, Junco says more research is needed to explore specific recommendations for instructors.

More information: "Predicting course outcomes with digital textbook usage data," *The Internet and Higher Education*, Volume 27, October 2015, Pages 54-63, ISSN 1096-7516, dx.doi.org/10.1016/j.iheduc.2015.06.001

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