

## **Undergraduate Student Preferences for Textbooks Online vs Paper**

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### **Abstract**

Student preferences for the medium for their textbook are changing. Fifteen years ago, online textbooks were not as good as their printed versions. It is expected that fifty years from now we will probably be using only online books. Individual instructors must decide whether student preferences have reached the tipping point. Surveying those students periodically is necessary to track the progress. NC State University and Georgia Southern University are both large, public universities which teach engineering. Nonetheless the anecdotal comments heard by the authors suggested there might be a difference of opinion in the different student populations. We surveyed the students in both locations to ascertain what the current students thought statistically rather than anecdotally. 183 students from NC State and 31 students from Georgia Southern filled out the survey in Google Forms. Results described below suggest that the point in time to switch to electronic textbooks is coming. Right now, students prefer the cheaper book and are willing for that book to be either online or in print. When the cost is identical, students still prefer to own or rent a printed textbook.

### **Keywords**

textbooks, undergraduates, electronic textbook, affordability, textbook accessibility

### **Introduction**

WIRED magazine August 4<sup>th</sup>, 2019 published “The Radical Transformation of the Textbook” which highlighted the serious implications of the way textbooks are bought and sold in higher education.<sup>1</sup> The first online textbook rental service was launched by Chegg in 2007. Since then, every major publisher has moved some of its offerings to the internet. Early textbooks were difficult to navigate; textbooks still do not always handle the translation to different devices well. Online textbooks are now more accessible – and often more feature rich – than traditional hardcopies. Still affordability is the primary concern of students, and online texts are notorious for limiting the use of used books. The focus on affordability is unsurprising as the cost for college textbooks increased 87.5% from 2006 to 2016 according to the Bureau of Labor Studies (BLS) Consumer Price Index (CPI).<sup>2</sup>

Gregory investigated undergraduates’ attitudes toward electronic books and found that given the choice between using a print book or an electronic textbook, 66% of the students surveyed would prefer a print book.<sup>3</sup> Interestingly, the primary reason the students preferred a print book was access (portability). Gregory’s study was conducted in 2006 before the launch of Apple’s iPhone in 2007 and the iPad in 2010. The study did not look at the impact of student cost. Likewise, Mizrahi surveyed undergraduate students from a variety of disciplines and found that 67.7% of respondents agreed or strongly agreed that they preferred to have their course materials on paper

with nearly 68% of the survey respondents disagreeing or strongly disagreeing with the statement “I prefer to read my course readings electronically.”<sup>4</sup> In a similar study, Edmonson and Ward surveyed students’ attitude regarding the medium of their textbook. The authors found that 78.5% of the undergraduate students surveyed would prefer a physical textbook (hardback or paperback) if price was not an issue.<sup>5</sup> In addition, given real-world pricing options, the students surveyed by Edmonson and Ward preferred a paperback textbook priced at \$84.99 rather than an electronic textbook priced at \$65.00 by a margin of 47.1%. McGowan et al. found that while 82.2% of the students surveyed would choose a paper textbook over an electronic textbook, 81.3% of students perceived cost as an advantage of electronic texts while only 4.2% of students perceived cost as an advantage of paper texts.<sup>6</sup>

The student preferences surveyed here will probably not last forever. As online texts and the devices to read them on improve, we expect that the students will change from wanting a paper text to wanting an online one. We have heard student complaints about the affordability of texts as well. However, picking a textbook demands more than anecdotal opinions from a few students. Of particular interest is the opinion of undergraduate students pursuing a degree in the area of mechanical engineering.

### **Survey Demographics**

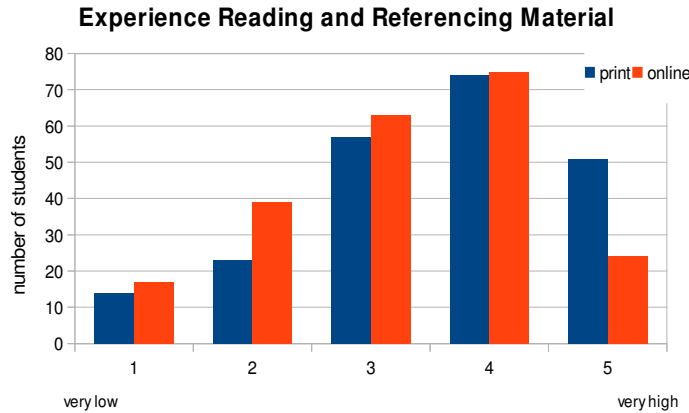
The survey regarding student textbook preferences was created in Google Forms (included as an appendix.) Links to the survey were emailed to the students at both universities: 365 students at NC State and 68 students at Georgia Southern received the link. Response rates were 50% at NC State (183 students responded) and 46% at Georgia Southern (31 students responded.) Student emails were collected to limit the students to a single submission and identify their schools.

77.2% of the students self-identified as male, 21.9% self-identified as female, and the remainder did not wish to identify. The majority of students (62.1%) were between the ages of 18 and 19. 22.8% were between 20-21, 7.3% between 22-23, and 7.8% were 24 or older. 87.2% of the respondents did not self-identify as members of an underrepresented racial or ethnic minority. 76.3% of the students were classified as freshman or sophomores with the remaining 23.7% classified as juniors or seniors. The population differed between the universities: at NC State the students surveyed were all taking Engineering Statics which is usually taken by first-semester sophomores while at Georgia Southern the students surveyed were all taking Heat Transfer which is suggested for second-semester junior year.

### **Results**

The first questions asked the students to rate their experience level reading and referencing material in a printed textbook: 57.4% of respondents rated their experience level as high or very high. However, when asked the same question about reading or referencing material in an electronic textbook, only 45.4% of respondents rated their experience level as high or very high – a 12% decrease (Figure 1).

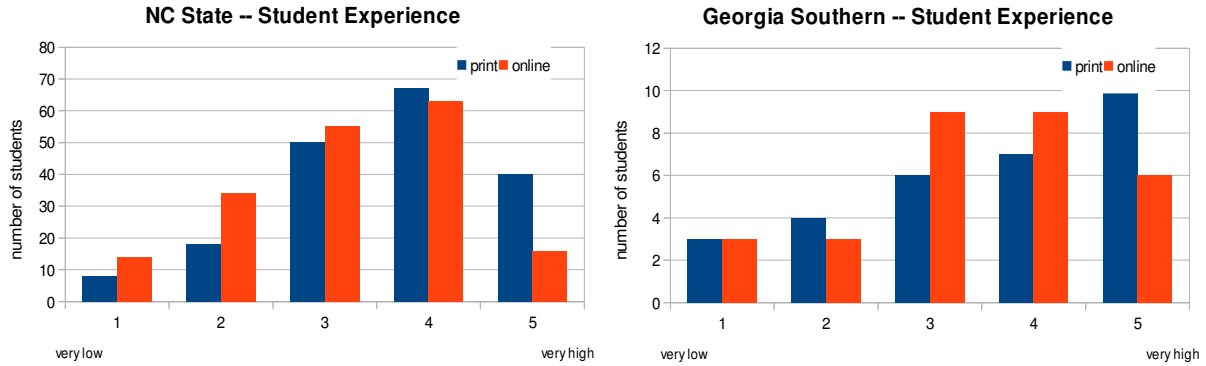
**Figure 1. Rate your experience level reading and referencing material in a printed/online textbook.**



Nearly one-third of respondents rated their experience level reading and referencing material in both printed and online textbook as high. Students reported very-high experience with online texts less often (23% to 11% of respondents), but the overall difference between self-reported experience between the two delivery modes did not seem very significant.

The number of respondents at Georgia Southern limits the ability to make strong conclusions about whether the schools were different. Figure 2 shows the two schools independently.

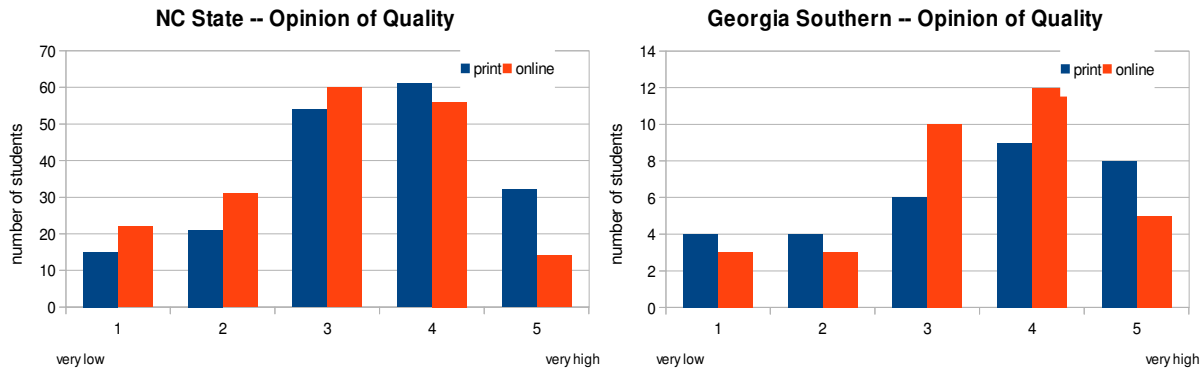
**Figure 2. Student experience by school.**



It is possible that Georgia Southern students had more experience with online texts than the NC State students, but this difference could be a product of the small numbers of students.

Questions three and four asked students about the perceived quality of online vs print textbooks. Nearly half (50.3%) of the students surveyed rated their overall opinion of printed textbooks as high or very high while 39.8% did so regarding online textbooks (see Figure 3). 21.9% of students had an unfavorable opinion of printed texts while 26.9% had an unfavorable opinion of online textbooks. Note: the overall opinion combining the schools is not shown. The number of students at NC State swamps the number of respondents at Georgia Southern so that that the combined figure basically matches the NC State figure.

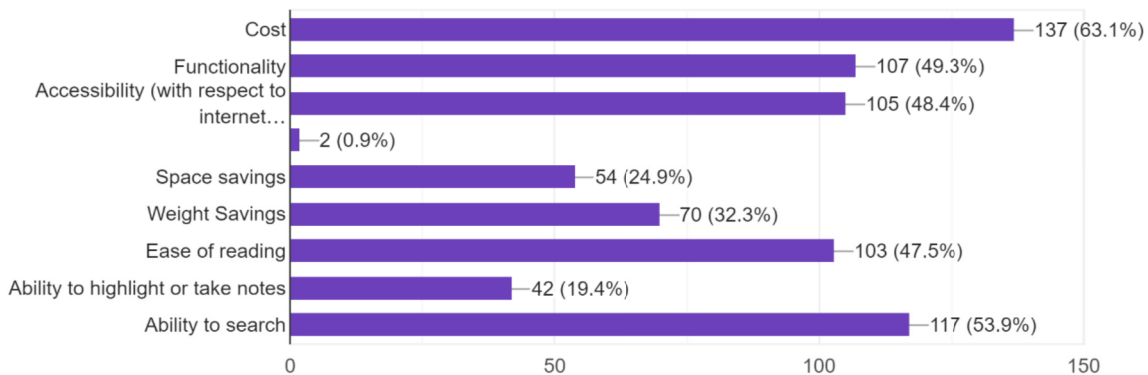
**Figure 3. Overall Opinion of Online and Printed Texts.**



The present study corroborates the literature results: our students still believe that printed texts are preferable to online texts. Noting again that the numbers at Georgia Southern are small, it seems that students there report more experience with online texts than at NC State and a lower opinion of the quality of print textbooks than the students at NC State.

Affordability however is still important. Overall if costs were equivalent, 64% of the students surveyed preferred a print text with 36% preferring an online text. At Georgia Southern only 16% preferred to have an online text (provided costs were the same.) We asked students what three factors most affected their opinions of online texts: 63.1% of students indicated that cost was most important. The next most important factors affecting their opinion of online textbooks in order of perceived importance were ability to search (53.9%), functionality (49.3%), accessibility with respect to internet access (48.4%), ease of reading (47.5%), weight savings (32.3%), and space savings (24.9%). (Figure 4) One additional conclusion we drew from this data is that students didn't like being limited to three answer choices. Of the 219 respondents, 54 chose more than 3 options. Four students selected eight of the nine choices.

**Figure 4. Factors Affecting Student Opinion of Electronic Textbooks**



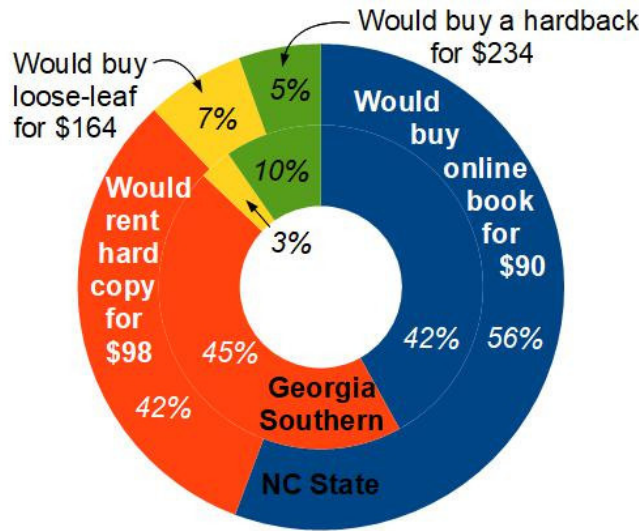
We anticipated that cost was going to be a prime driver. We asked students how much extra they would be willing to pay for a printed text. 38.4% of students surveyed would not pay a premium at all to use a physical text over an electronic text. Furthermore, over three-fourths (75.4%) of students would pay no more than a \$20 premium for a physical text (see Figure 5).

**Figure 5. Additional Price Premium to Purchase a Physical Text**



Finally, when presented with a real-world pricing scheme from an undisclosed publisher, the majority (54.8%) of students would purchase an electronic textbook. Interestingly, 11.8% of the students surveyed would purchase a physical textbook (hard-copy or loose-leaf). However, one-third of students would choose to rent a hard-copy of a physical textbook (see Figure 6).

**Figure 6. Textbook Medium Purchasing Preferences Based on a Publisher’s Pricing Scheme**

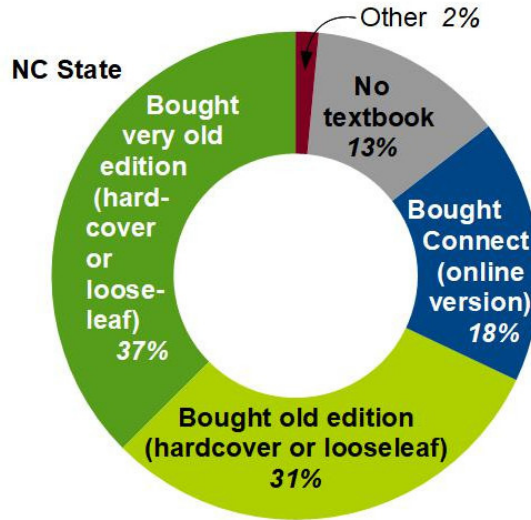


**Discussion**

This project began after a discussion where Professor Calamas at Georgia Southern mentioned he had heard anecdotally that most of his students preferred to have their books online. That these anecdotes turn out to be different from the results from a bigger survey reinforces our belief that surveys such as these are important to conduct. Our conclusion is that cost is driving the student decisions. As the online textbooks improve, surveys such as these will need to be conducted again at regular intervals.

During Fall 2019 students in Statics at NC State were allowed to choose any version of Beer & Johnston Statics. The students in class were asked what text they had purchased; 331 students attended class that day. The results from the in-class survey can be found in Figure 7.

**Figure 6. In-Class Survey of Final Purchasing Decision, NC State only**



The online version of the text was what the Bookstore had purchased. Rentals were not one of the choices listed in this in-class survey. The instructions before the semester suggested to the students that they “buy any version or edition of the book they'd like” and “not try to do this course without some version of the textbook as one of the goals is to teach you how to read an engineering text.”

We conclude that the tipping point where the majority of students prefer the online books has not been reached. When cost is equivalent, students still prefer a hardcopy. And yet, cost is king: students who might prefer a print book often buy an online book when it is cheaper.

We strongly believe that such surveys should be conducted at regular intervals. It is clear that students have become comfortable with required online texts, though the majority do not yet prefer them. As the online versions improve, we expect to see even more students preferring them to the print books as 36% of the students already do.

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David Calamas is an Assistant Professor in the Department of Mechanical Engineering at Georgia Southern University. He currently teaches undergraduate and graduate lecture and laboratory courses in the areas of fluid mechanics, thermodynamics, and heat transfer. He currently conducts research in the areas of active and passive thermal management, thermal and fluid transport processes, biologically-inspired designs, and engineering education.

## Appendix

The survey began with four questions using a 5-point Likert Scale (1 = Very Low, 5 = Very High).

1. Rate your experience level reading and referencing material in a printed textbook.
2. Rate your experience level reading and referencing material in an online textbook.
3. Rate your overall opinion of printed textbooks.
4. Rate your overall opinion of online textbooks.
  
5. If the price was the exact same, would you prefer an online textbook or a printed textbook?
  
6. Which of the following factors most affect your opinion of online textbooks?  
Choose up to three.
  - Cost
  - Functionality
  - Accessibility (with respect to internet access)
  - Accessibility (with respect to disabilities)
  - Space savings
  - Weight Savings
  - Ease of reading
  - Ability to highlight or take notes
  - Ability to search
  
7. Previous research has shown that a majority of students would buy a low-cost printed textbook even over using a free online version of the same text. How much extra would you pay for a printed book?
  - \$0 - I'd prefer an online book.
  - \$10
  - \$20
  - \$50
  - \$100
  - \$150
  - \$200
  
8. The choices below are commensurate with current purchasing options as provided by a publisher in higher education. If given the choice by your instructor, which of the textbook options would you choose?
  - Electronic textbook (\$90)
  - Textbook rental (\$98)
  - Loose-leaf purchase (\$164)
  - Hard-copy purchase (\$234)

Demographic data was collected including age, gender, underrepresented minority status, and major.