Affordable Learning Georgia Affordable Materials Grants  
Transformation Grants Final Report

# General Information

**Date:** Dec. 19, 2025

**Grant Round:** 26

**Grant Number:** 752

**Institution Name(s):** Kennesaw State University

**Project Lead:** Chanler Hilley

**Team Members (Name, Title, Department, Institutions if different, and email address for each):** Chanler Hilley (chilley2@kennesaw.edu), Dianhan Zheng (dzheng4@kennesaw.edu), Hansol Rheem (hrheem@kennesaw.edu)[[1]](#footnote-1)

**Course Name(s) and Course Numbers:** PSYC 3000 – Statistical Applications in Psychological Science

**Semester Project Began:** Spring 2025

**Final Semester of Implementation:** Fall 2025

**Total Number of Students Affected During Project:** 127

# Narrative

* 1. *Describe the key outcomes, whether positive, negative, or interesting, of your project. Include:*
* *Summary of your transformation experience, including challenges and accomplishments*
* *Transformative impacts on your instruction*
* *Transformative impacts on your students and their performance*
  1. *Describe lessons learned, including any things you would do differently next time.*
  2. *Describe any materials you created or revised/remixed that will be shared with the public. Include the* [*open license your materials will be shared under*](https://creativecommons.org/share-your-work/)*—for most materials, this will be an Attribution 4.0 License (CC BY) as required in the Grants Request for Proposals.*

The purpose of this project was to provide students in Kennesaw State University’s Statistical Applications in Psychological Science course with a free, interactive online textbook and homework system. Through this project, we have removed previous costs associated with e-textbooks and online assignment systems available through traditional textbook publishers, resulting in a cost savings of $6,985 for 127 students in 4 sections of the course in Fall 2025.

Publisher textbooks in psychological statistics and their companion online assignment systems typically cost $50 to $120 for each student. No-cost OER textbooks that were in existence prior to this project are either not tailored to psychology students or do not have accompanying online assignment systems that are both low cost and adaptive to student needs (e.g., multiple question/assignment versions). Therefore, our project team aimed to (a) create a more engaging version of an existing textbook that was well aligned with our course learning objectives but was available only in static web and PDF formats and (b) create assignments corresponding to each textbook chapter in a free, online homework system that gives students immediate feedback.

The new interactive components of the textbook provide students with visualization and opportunities to receive immediate feedback regarding their learning progress, which is intended to facilitate deeper comprehension of learning materials and promote student success. We achieved this by remixing the existing textbook, including (a) adding videos illustrating key concepts, (b) incorporating short self-quizzing activities (i.e., H5P questions) into the subsections of each chapter, (c) adding additional OER content regarding factorial and repeated measures analysis of variance, which did not exist in the primary textbook, and (d) doing this in the LibreTexts environment, which can link the textbook directly to the LMS and supports a broader range of OER activities for future development.

The assignments created in the free, online homework system provides dynamic questions that students can use to practice their skills. These assignments are intended to primary serve as formative assessments in which students can repeatedly attempt them with newly generated data to gain practice, with content in line with the 15 chapters in the textbook. However, the same system could also be used to create summative assessments like quizzes or tests. These types of materials are particularly beneficial for students in online or hybrid sections where opportunities to gain real-time feedback are limited by the course modality. The online assignments are hosted on MyOpenMath, a free homework platform with LMS integration capabilities.

These pedagogical innovations were intended, in part, to address the high DFWI rates in this course by providing students with opportunities for practice. Instructors of PSYC 3000 recognize a need for students to gain practice with the abstract and complex concepts covered in statistics courses. Our project overcomes many of the limitations that exist with current solutions. For example, quizzes in D2L and activities in SoftChalk have limited or no ability to generate data or split questions into multiple linked parts, so instructors experience limitations in providing assignment content that is unique to each student and/or across multiple attempts for the same student. Anecdotally, students who use paid materials (e.g., MindTap), which can generate multiple versions of the same question, have reported that the MindTap assignments designed by the publisher are sometimes disconnected from the lecture content. Our custom-fit online assignment platform addresses these shortcomings.

## Transformation Experience

Our transformation experience resulted in two types of materials for our Statistical Applications in Psychological Science course, a required course for Psychology majors at Kennesaw State University. The resulting textbook is more interactive and engaging than the existing OER textbook we remixed, and the assignments created in the online homework platform provide students with more opportunities for low-stakes learning than traditional static homework. Our transformation plan was ambitious. Completing this transformation has been rewarding and enabled two instructors to remove textbook costs and align their courses with the OER materials created through this project. In addition to impacts of the transformation on the courses we directly teach, we worked with the university IT department to integrate MyOpenMath with the D2L Brightspace LMS, so now all KSU faculty have access to this free, OER homework system.

The primary challenges we encountered related to the post award process; getting the Service Level Agreement signed and hiring a graduate assistant for the summer term each took longer than anticipated and shortened the timeframe the team was able to work on the project. In addition the impact on our instruction and access described above, we have begun sharing information about the textbook and assignments. In doing so, we were awarded a *Best Presentation* award from the PsychTERMS conference and collected information from attendees from across the United States and Canada who wish to learn more about the materials. We plan to continue disseminating the materials through email outreach and a publication regarding the evaluation of the materials.

## Transformative Impact on Instruction and Student Performance

Using the remixed textbook in LibreTexts, students were able to watch calculation tutorial videos immediately after they learned the materials and complete interactive no-stakes (i.e., no points) questions relating to each chapter subsection’s content. These videos and activities help to solidify understanding and is especially beneficial for students who missed a class or failed to follow closely during in-person lectures or are enrolled in online or hybrid courses.

The MyOpenMath homework assignments give students low-stakes weekly (or module) practice opportunities, which helps them build skills and self-efficacy gradually through repetition. These assignments enable instructors to structure lectures more effectively; for example, lectures can include similar problems and prepare students for their homework. Instructors are able to spend in-person lecture time more intentionally by dedicating class time to questions that students underperformed on based on feedback (e.g., scores, student questions) regarding the MyOpenMath homework. For example, when many students had difficulty completing an ANOVA summary table on MyOpenMath, the instructor reviewed that knowledge in greater depth and incorporated similar questions into future assessments. The MyOpenMath homework assignments were especially beneficial for students in online sections; prior to these assignments, students completed worksheet-style and open-response practice problems assignments but needed to wait for detailed instructor feedback. Now, they can get instant feedback while completing the assignment and immediately re-attempt the question to improve their understanding.

## Lessons Learned

We encountered several circumstances that encourage reflection and modification:

* Rounding errors in MyOpenMath occasionally occurred, which frustrated some students. We have already reviewed the question code for many of these issues and will continue to do so for future semesters to reduce the likelihood of rounding errors.
* An additional set of math refresher content (e.g., a MyOpenMath with unlimited attempts) would be beneficial at the beginning of the semester. Variability in mathematics preparation across students is a common challenge reported by students and faculty alike. However, ensuring that all students have the basic math skills required for the course (e.g., squaring/square roots, order of operations, solving equations) at the start of the semester is imperative for success in the course.
* Occasionally the symbols in the textbook and the symbols students see in other sources are slightly different (e.g., M in the textbook [using APA notation] but X-bar in other sources [e.g., Khan Academy videos]). The use of various names and notation is a common challenge across many statistics textbooks and in statistics practice. Therefore, we will continue teaching students about the various names and notations that may be used and which are used interchangeably, as they will likely encounter this in the future.
* We will continue to devise strategies to encourage students to read and interact with the textbook.
* We will continue to refine the D2L course setup to ensure requirements are clear to students. Because these materials are not on a single platform like what students may be accustomed to with traditional publisher materials, the LMS course needs to be set up in a straightforward and consistent manner to avoid disruptions and confusion.

## Materials

This project resulted in two primary materials:

1. The remixed textbook is publicly available on the [LibreTexts online bookshelf](https://stats.libretexts.org/Courses/Kennesaw_State_University/Statistical_Applications_in_Psychological_Sciences_with_Multimedia). The page provides options to read the textbook online, save PDFs of the full book or individual chapters, download the LMS cartridge, or purchase a printed version.[[2]](#footnote-2) The textbook is shared under a CC BY NC SA 4.0 license, as they were remixed from materials that require sharing under the same license.
2. The chapter assignments are available in the free MyOpenMath platform. MyOpenMath requires a verified instructor account to access these materials.

In addition to these materials, we are sharing several ancillary documents:

* Faculty interested in implementing either of these materials in their own courses may find additional information on accessing and linking the materials to D2L Brightspace in the *Using LibreTexts & MyOpenMath - Quick Guide* document.
* Our presentation slides about these materials presented at the 2025 PsychTERMS (Teaching to Enhance Research Methods & Statistics in Psychology) virtual conference.
* PDFs from the web surveys we used to collect evaluation data for this project.

# Quotes

* *“…Yes. I really like these kinds of videos, especially from these credible sources. They have a very good they have a very good way of explaining it. And I mean, it adds that on that visual and auditory effect where it might be. I mean, it's a good variation tool. Some people don't, they don't do well with reading, and they do better with visual things. So it's a very good way to add some diversity to it. …So this where it's you answer things. And, and it gives you the right answer. And a little reward to say, I feel I feel like that feature is really nice. And it's a nice little touch to make the person feel a little bit happy and gives them a little bit of dopamine to keep going.”*
* *“Yeah, I think it's [textbook and homework system] really good for an online class. Especially compared to some I've had, I know that in some classes, I have like an extra platform that kind of does a lot of sort of quiz and flashcard type formats. And those I think are good too. But I think this was good as far as just the way it's the tools that it has in the way it's laid out.”*
* *“I actually thought the [homework] platform was really easy going and honestly it was not hard to navigate through especially because it tells you everywhere on the top like what you know you have up here how much time you have left if you want I guess save your progress if you have like multiple attempts but I thought it was cool up here how it tells you what your score is how many tries and then getting a similar question that was kind of interesting.”*
* *“Yes, it gave me an option to even add notes as I'm going. Um, it would allow me to highlight, um, it's given me a lot of visual, um, concepts as well. Um, that way I don't necessarily have to draw them out myself. Um, so I can always revisit those visuals, but it also just made it really easy to read. So if I wanted to write down word for word the way that I like to study, I have so many different formats that I can read this in. The readability is amazing.”*
* *“Overall, I'd say it was a pretty good experience. I think one thing that is very helpful is having it integrated into D2L as on its own. Like I said, I think inquisitive is one of those things where it opens a bunch of tabs on your computer and it can be confusing to navigate them, especially if you only have one screen to work on. I think that is very helpful, just having it integrated into D2L and not having to access some third-party website to complete your scores. For example, McMillan and other third-party quiz takers that you take along with textbooks and stuff, I think those are very frustrating to use. I think this is great and I think it's very helpful that I don't have to go out of my way to complete my homework.”*

# Quantitative and Qualitative Measures

## Uniform Measurements Questions

**Student Opinion of Materials**

**Was the overall student opinion about the materials used in the course positive, neutral, or negative?**

Total number of students affected in this project: \_\_127\_\_

* Positive: 58.5% of 53 survey respondents
* Neutral: 35.8% of 53 survey respondents
* Negative: 5.7% of 53 survey respondents

**Student Learning Outcomes and Grades**

**Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

Choose One:

* \_\_\_ Positive: Higher performance outcomes measured over previous semester(s)
* \_ X\_ Neutral: Same performance outcomes over previous semester(s)
* \_\_\_ Negative: Lower performance outcomes over previous semester(s)

**Student Drop/Fail/Withdraw (DFW) Rates**

**Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

\_\_16.5\_\_% of students, out of a total \_\_127\_\_ students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

* \_\_\_ Positive: This is a lower percentage of students with D/F/W than previous semester(s)
* \_X\_ Neutral: This is the same percentage of students with D/F/W than previous semester(s)
* \_\_\_ Negative: This is a higher percentage of students with D/F/W than previous semester(s)

## Measures Narrative

We collected three categories of data over the course of the project:

* User Testing Data: User comments and survey responses from usability testing conducted in Summer and Fall 2025 (quotes reported above are from these data)
* Student Success Data: Average comprehensive exam scores and DFW rates from the Spring and Fall 2025 semesters.
* Textbook Survey Data: Data from a two-part survey administered during the Spring and Fall 2025 semesters

In the following sections, we compare student success data and textbook survey data from Spring 2025, the “pre-transformation” semester when instructors used existing materials, with Fall 2025, the “post-transformation” semester when all three instructors adopted the remixed LibreTexts textbook and MyOpenMath assignments. As the Fall 2025 semester concludes, some student success data are unavailable but will be reported in future peer-reviewed publications.

**Student Success Data**

The drop, fail, or withdrawal (DFW) rate and average comprehensive final exam scores were compared between the Spring and Fall 2025 semesters. Because the instructors’ comprehensive exams cover content taught throughout the semester, the final exam scores provide a valid end-of-semester measure of students’ knowledge of the course content and a more appropriate basis (in % scale) for comparison across semesters than measures like final letter grades, which are less comparable over three instructors and three modalities.

Table 1 shows the DFW rate and average comprehensive exam scores across the two semesters. The DFW rate increased by 0.35% points, suggesting comparable effectiveness of the new OER materials. The comprehensive final exam scores decreased by 2.47% points on average, primarily driven by sections that previously completed an online final exam but in Fall 2025 completed an in-person final exam. Additionally, the Textbook Survey Data, reported in more detail in the following section, indicate that students worked more hours in the Fall 2025, suggesting that these small changes cannot be solely attributed to the new materials.

**Table 1.**

*DFW rate and comprehensive exam score between Spring and Fall 2025 semesters*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Semester** | **Course Modality (Instructor)** | **Enrolled** | **DFW Count (%)** | **Comprehensive exam Score %** |
| Spring 2025 | Online (Hilley) | 34 | 11 (32.4%) | 73.95% |
| Hybrid\* (Zheng) | 70 | 8 (11.4%) | 71.15% |
| F2F\*\* (Rheem) | 69 | 9 (13%) | 83.01% |
| Sum (Weighted Average) | 173 | 28 (16.18%) | (76.43%) |
| Fall 2025 | Online (Hilley) | 35 | 12 (34.3%) | 84.15% |
| Hybrid\* (Zheng) | 59 | 4 (6.7%) | 65.10% |
| F2F\*\* (Rheem) | 33 | 5 (15.2%) | 79% |
| Sum (Weighted Average) | 127 | 21 (16.53%) | (73.96%) |

*Note.* \*33% Online; \*\*Face-to-face (Fully in-person) course.

**Textbook Survey Data**

A two-part survey consisting of a process survey and an outcome survey was administered during the Spring and Fall 2025 semesters to students who agreed to participate. The process survey was administered around the midterm week and primarily assessed student characteristics (e.g., part-time or full-time employment status), preparedness (e.g., prior experience with statistics or research methods courses), study patterns (e.g., textbook usage frequency and average study time), and initial impressions of the textbook (e.g., perceived usefulness of the textbook). The outcome survey was administered prior to finals week and measured students’ statistical anxiety, attitudes toward statistics, satisfaction with the learning materials, and perceived efficacy of the learning materials.

***Method***

Although students were encouraged to take part in both surveys, many students completed only one, leading to an uneven number of respondents for each survey. Accordingly, the number of unique students who participated in the study is reported. Table 2 summarizes the student sample affected by this project. Overall, adopting these materials resulted in an estimated savings of about $7,000 per semester for students.

**Table 2.**

*Enrollment and course material by course modality (instructor)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Semester** | **Course Modality (Instructor)** | **Enrolled**  **(Survey Participants)** | **Course Material (Cost per student)** |
| Spring 2025 | Online (Hilley) | 34 (19) | Static OER + Noninteractive homework ($0) |
| Hybrid\* (Zheng) | 70 (42) | Online courseware + Interactive homework ($98.37) |
| F2F\*\* (Rheem) | 69 (31) | Online courseware + Interactive homework ($35) |
| Total | 173 (92, 53%) |  |
| Fall 2025 | Online (Hilley) | 35 (25) | LibreTexts + Interactive MyOpenMath homework ($0) |
| Hybrid (Zheng) | 59 (37) |
| F2F (Rheem) | 33 (10) |
| Total | 127 (72, 57%) | Total Savings of $6,985 |

*Note.* \*33% Online; \*\*Face-to-face (Fully in-person) course.

Depending on the measurement scale, we used two-way chi-square tests, Welch’s *t*-tests, or Kruskal-Wallis tests to compare differences means or frequencies across the two semesters. An important feature of this comparison is that each instructor taught in a different modality (i.e., online, hybrid, and face-to-face), allowing us to examine how the materials performed across teaching formats.

***Findings***

**Process Survey**. We first examined student preparedness and study patterns from the process survey to identify potential confounding factors. Students in Spring and Fall were largely similar in regard to their prior statistics experience, textbook use, and average study time. However, Fall 2025 students worked significantly more hours across all instructors, *p* < .01, which should be considered when interpreting the results.

**Outcome Survey**.Next, we examined composite scores (average across individual items) from the outcome survey and found similar or better results for the new OER materials (LibreTexts & MyOpenMath) compared to the existing materials. We did not observe significant semester differences in attitudes toward statistics, satisfaction, or perceived efficacy. These findings suggest that the no-cost OER materials adopted in Fall 2025 had a similar impact on students’ learning experiences as the existing materials used in Spring 2025, which cost between $35 and $100. More importantly, the average statistical anxiety score decreased across all modalities, *p* = .03, possibly driven by the significant reduction in the F2F course, *p* = .04 (***Figure 1***A). This reduction trend was also observed in the online and hybrid courses, but it was not statistically significant when comparing the modalities separately.

To explore potential factors underlying this reduction, we also conducted statistical analyses on individual items from the attitudes toward statistics, satisfaction, perceived efficacy, and statistical anxiety scales. From the survey items regarding satisfaction, we found that student satisfaction with graded assignments increased significantly in the F2F course after adopting MyOpenMath, *p* = .02 (“Graded assignments helped me understand the course material”; ***Figure 1***B). Overall, we observed reduced statistical anxiety alongside comparable outcomes on other measures, which we view as a success given that these results were achieved at no cost to students.

***Figure 1****.* Survey results. A) Comparison of composite scores from the Student Statistical Anxiety Survey (SAS). B) Comparison of scores for a selected item from the Satisfaction Toward the Textbook Survey. An asterisk denotes statistical significance at α = .05.

***Additional Potential Influences on Outcomes***

Although we collected pre- and post-transformation data to enable the comparisons described above, we note several factors that readers should consider in their interpretation of these comparisons. One instructor used the same textbook but in a different format, and the other two instructors implemented an entirely new textbook in Fall 2025. All three instructors needed to make modifications to their grading systems to account for the MyOpenMath assignments, so DFW rates are not directly comparable. Regarding exams, one instructor implemented the option for students to re-attempt incorrect questions for partial credit; another moved exams from online administration to in-person administration and increased the weight of exam grades in the final grading scheme; and all three administered a cumulative final exam in both semesters. As noted above, data from student surveys also indicated that students worked significantly more during the post-transformation semester.

# Sustainability Plan

Each of the three primary team members teaches at least one section of this course each semester. We are committed to maintaining and updating the course materials in a way that not only ensures their accuracy for our own courses, but by editing the source materials, edits will automatically be applied for other instructors using these course materials. This creates implications for other instructors, which are described in our Using LibreTexts & MyOpenMath - Quick Guide document.

The team will conduct biannual reviews each May and December after the adoption of the new materials. The first step in our review process is to verify the accuracy of the online assignments and ensure that hyperlinks, videos, and activities in the textbooks are still active. We will leverage data from MyOpenMath to identify questions that students struggled with the most and investigate whether these challenges stem from the complexity of the questions, unclear wording, or gaps in instructional materials. Finally, we will examine the association between students’ performance on the MyOpenMath assignments and their final grades in the course. This analysis will provide insights into whether we can improve the alignment between the online assignments and the overall learning objectives.

In subsequent semesters, we will continue to solicit student feedback about the new materials through informal feedback surveys (e.g., satisfaction, usage) and monitoring formal course evaluation comments.

We will implement an improvement process yearly in May to maintain and update the course materials. This process will include: (1) updating and refining questions and explanations to improve clarity and accuracy, (2) adjusting the difficulty levels of questions based on students' performance and feedback, (3) providing updated technical support materials to help students navigate LibreTexts and MyOpenMath effectively.

# Future Affordable Materials Plans

Dr. Zheng previously used a publisher text with an associated online homework platform; she notes that she thinks MyOpenMath works well as a free homework platform. She teaches Statistical Applications each semester, and if she teaches other stats-related classes in the future (e.g., Advanced Lab), she will consider creating similar homework on MyOpenMath again.

Dr. Rheem has been exploring ways to reduce students’ financial burden without compromising learning quality. Initially, he was not aware that adopting, creating, or remixing open educational resources was a viable option or that this approach could have a meaningful impact. After witnessing the positive effects of OERs on students’ learning experiences, he plans to expand these efforts to upper-division, specialized courses that typically have even more limited OER options, requiring students to pay substantial amounts for course materials.

Dr. Hilley uses OER materials for all of the upper-division courses he teaches at KSU, but this project introduced him to the process of remixing and creating OER materials. He notes the considerable need for students to gain iterative practice in statistics; in shifting to teaching statistics in a primarily online format over the past year and a half, he noted that this type of practice was especially limited with OER materials. Therefore, prior to this project, he considered selecting paid publisher materials to provide online practice opportunities to students, but this project enabled him to provide the same resources in more interactive formats. Dr. Hilley is committed to affordable and accessible materials and will consider additional opportunities to both use and create OER materials for future courses.

# Future Scholarship Plans

Our evaluation of the course materials included an IRB-approved study based on principles from the Scholarship of Teaching and Learning (SoTL) and user experience (UX) research. From a SoTL perspective, we collected data from students in Spring 2025 (pre-implementation) and Fall 2025 (first semester of implementation) to assess their satisfaction with and use of course materials; we also asked for specific feedback on the course materials and assessed learner-oriented constructs like statistics anxiety. From a UX perspective, we conducted user interviews with students who previously completed PSYC 3000. During the interviews, students were asked to interact with the new materials and provide feedback.

We anticipate that this work will result in at least one presentation and one publication. Our presentation entitled *Enhancing Psychological Statistics Learning Through Open and Interactive Course Materials* was presented at the 2025 Teaching to Enhance Research Methods & Statistics in Psychology (PsychTERMS) conference and won a *Best Presentation* award. The manuscript is in progress, and we anticipate submitting it to a journal focused on psychology education or online learning in 2026.

1. We are appreciative of the contributions by Maci DeMott, who served as a student assistant for the duration of the project and was integral to the creation, review, and formal evaluation of course materials; An Nguyen, who served as a graduate assistant, and completed many of the technical edits required in MyOpenMath; Amanda Wolfe, who served as a faculty peer reviewer of the textbook and assignment materials; and Chelsee Dickson, who copyedited the textbook and advised the project team on OER best practices. [↑](#footnote-ref-1)
2. Any purchases are processed directly through LibreTexts, and their FAQs note that “the cost is to cover the printing and shipping expenses along with a minor administrative fee to help maintain the bookstore.” The project team does not receive payment related to purchasing printed copies. [↑](#footnote-ref-2)