**Affordable Learning Georgia Textbook Transformation Grants**

**Final Report**

*To submit your Final Report, go to the Final Report submission page on the ALG website:* [*http://affordablelearninggeorgia.org/site/final\_report\_submission*](http://affordablelearninggeorgia.org/site/final_report_submission)

*Final report submission requires four files:*

* *This completed narrative document*
* *Syllabus or syllabi* 
  + *(if multiple files, compress into one .zip folder)*
* *Qualitative/Quantitative Measures data files* 
  + *(if multiple files, compress into one .zip folder)*
* *Photo of your team or a class of your students w/ at least one team member, minimum resolution 800x600px* 
  + *(nearly all smartphones take photos larger than this size by default)*

*Follow the instructions on the webpage for uploading your documents. Based on receipt of this report, ALG will process the final payment for your grant. ALG will follow up in the future with post-project grantee surveys and may also request your participation in a publication, presentation, or other event.*

# General Information

**Date: 12/20/2019**

**Grant Round: Twelve**

**Grant Number: 378**

**Institution Name: Georgia Southern University**

**Project Lead: Paul Hadavas, Associate Professor, Mathematical Sciences, phadavas@georgiasouthern.edu**

**Team Members: William Coggins, Lecturer, wcoggins@georgiasouthern.edu**

**Course Name(s) and Course Numbers: Survey of Calculus, MATH 1232**

**Semester Project Began: Fall 2018**

**Final Semester of Implementation: Fall 2019**

**Total Number of Students Affected During Project: 440**

**(221 students on Armstrong campus over four semesters)**

**(219 students on Statesboro campus over three semesters)**

# 1. Narrative

A. Describe the key outcomes, whether positive, negative, or interesting, of your project.

Hadavas and Coggins began collaboration on a syllabus/topics list for Survey of Calculus, Math 1232, for the newly merged GSU in Spring 2018. At the time, the idea of using a no-cost text was introduced. There was only one option available for the economics-heavy topics required by the course. In contrast, there are a multitude of open-source Calculus books geared toward engineering and science majors. Hadavas began using “Applied Calculus“ by Calaway, Hoffman, and Lippman in Fall 2018 and Coggins followed in Spring 2019. In reviewing the book, the instructors determined that (along with any utilization of an online homework system) additional examples and homework problems were needed.

We completed the supplemental material for those sections of the text that are covered in the course by the end of Summer 2019. In Fall 2019, the students had a no-cost text, supplemental material and an online homework system. The biggest challenge along the way turned out to be the online homework. Our intention was that the entire course should be no-cost. That led to WebWork, a free system provided by the Mathematical Association of America. On both campuses, the students (who are mainly business majors) were extremely frustrated with the platform. In previous math classes, they had used paid systems that they felt were easier to navigate. As a result, Coggins switched back to a paid online system while still maintaining the no-cost text for the Summer 2019 and Fall 2019 semesters.

As a consequence of the use of the no-cost text, students saved from $125 to $225 (depending on format of a typical Business Calculus text) and for those using the paid online system on the Statesboro campus, the minimal cost of $75 allowed them access to videos and other tools.

B. Describe lessons learned, including any things you would do differently next time.

For Hadavas, the focus on the online homework by the students was more than Hadavas expected. In the future, he plans to switch out online homework for regular quizzes based on the supplemental material created by Coggins and Hadavas.

For Coggins, the WebWork system was a concern for his students and therefore concerned him. Investigation into a better free or lower cost option would be his focus.

# 2. Quotes

* Hadavas (Fall 2019) “The textbook and supplemental problems were honestly not very helpful and the homework problems on Webwork were TERRIBLE! Having to type in answers as if you were some time[sic] of computer scientists feeling like I was coding just to type in the answers, which did not help when trying to understand the math problems in general.”
* Hadavas (Fall 2019) “The homework and the textbook helped me a lot before exams”
* Hadavas (Fall 2019) “I’d also recommend that he uses webassign instead of WeBWorK. It costs like 30$ but each question provides one or all of the following: link to YouTube video, a link to a personally uploaded video, and a step by step how to.”

# 3. Quantitative and Qualitative Measures

## 3a. Uniform Measurements Questions

*The following are uniform questions asked to all grant teams. Please answer these to the best of your knowledge.*

**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: \_\_440\_\_\_\_\_

* Positive: 43.75 % of 16 number of respondents
* Neutral: 31.25 % of 16 number of respondents
* Negative: 25 % of 16 number of 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?**

*Student outcomes should be described in detail in Section 3b.*

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?**

**Drop/Fail/Withdraw Rate:***Depending on what you and your institution can measure, this may also be known as a drop/failure rate or a withdraw/failure rate.*

50.7% of students, out of a total 150 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)
* Neutral: This is the same percentage of students with D/F/W than previous semester(s)
* X Negative: This is a higher percentage of students with D/F/W than previous semester(s)

## 3b. Measures Narrative

In the data file submitted, we broke down the results for each instructor on the different campus over four semesters. We will ignore summer classes as they have their own unique challenges like time and, for Coggins, the fact that it was taught as a 100% online class. Also, we included grades of “D” as a failing grade since our business majors need a letter grade of “A”, “B”, or “C” in order to consider the course to be passed.

For Hadavas, there was a slight improvement in DFW% from 50.7% to 48%. However, the GPA for his classes hovered consistently around 1.9. For Coggins, the DFW% was most improved from Fall 2018 (paid text and paid online homework) to Spring 2019 (no-cost text and no-cost online homework) when the percent went from 43.6% to 37.0%. Without furthers semesters to consider, the rise in Fall 2019 could be a result of a particular group of students. Regardless, his classes maintained GPAs of 1.9, 2.2, and 2.1 respectively over the three full semesters considered for this grant.

The response rate for comments on the no-cost materials was low. While the majority expressed satisfaction with the text and supplemental material, the free online homework was the recipient for most of the negative comments. Conversations with students never revolved around the fact that they were using a no-cost text or had a supplement to use, but mainly about how frustrating using the WebWork could be.

# 4. Sustainability Plan

The supplemental material will reside on a shared Google drive along with the text. Next semester (Spring 2020) two Armstrong campus instructors teaching three sections of Math 1232 have agreed to use the no-cost text along with the Supplement created for this grant. They have also agreed to make comments and suggestions along with any corrections to the supplemental material. Hadavas will update the Supplement as those comments come in.

# 5. Future Plans

The goal to provide low-to-no cost material to our students has never been stronger. For the Armstrong campus, a majority of the math/stats classes are using open-resource texts. For Hadavas, the next course he hopes to switch to no-cost would be Linear Algebra which (unlike Business Calculus) already has multiple free texts available to choose from.

In our proposal, we mentioned presenting at a regional mathematics conference. Now that the grant has reached its conclusion, it seems likely that we could present our experiences with switching to no-or-low cost options in a business calculus course.

# 6. Description of Photograph

* Dr. Hadavas’ 11am section of Math 1232 (Fall 2019) working through their final exam.