

Affordable Learning Georgia Textbook Transformation Grants

Final Report

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

The final report submission form allows up to five files:

- This completed narrative document (required)
- Syllabus or syllabi (required)
If multiple files, compress into one .zip folder
- Qualitative/Quantitative Measures data files (required)
If multiple files, compress into one .zip folder
- Photo of your team or a class of your students for future ALG promotions (optional)
- Invoice for the second half of the grant's award amount (optional)

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: May 14, 2021

Grant Round: 16

Grant Number: 521

Institution Name(s): Columbus State University

Project Lead: Dr. Houbin Fang, Associate Professor, Mathematics Department
fang_houbin@columbusstate.edu

Team Members (Name, Title, Department, Institutions if different, and email address for each): Dr. Nehal Shukla, Associate Professor, Mathematics Department
shukla_nehal@columbusstate.edu and Ms. Elizabeth McInnis, Lecturer, Mathematics Department
mcinnis_elizabeth1@columbusstate.edu

Course Name(s) and Course Numbers: MATH 1001, Quantitative Skills and Reasoning

Semester Project Began: Spring 2020

Final Semester of Implementation: Spring 2021

Total Number of Students Affected During Project: 163 students in 5 sections (total including one instructor outside of our grant team) 135 students in 4 sections taught by our team of 3 instructors.

1. Narrative

A. *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*

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

The transformation experience was certainly more challenging than any of us expected going into this grant process in February of 2020. The pandemic and subsequent shift to online teaching in March 2020 impacted our ability to devote immediate time to our work creating open resource materials for Quantitative Skills and Reasoning. However, we ramped up our progress over the summer and fall of 2020. Traditionally this course is taught using WebAssign with e-book text included, costing the students roughly \$100. Instead of using this book and homework management system, we recorded a total of 38 10- to 25-minute videos covering a variety of mathematical topics to include:

- Reasoning and Logic
- Sets
- Functions
- Financial Mathematics
- Counting, Probability and Odds
- Statistical Measures of Central Tendency and Dispersion

Videos were planned, recorded, and edited individually by the three team members based on instructor expertise and OER; we divided up the topics and prepared the videos and resulting notes as equitably as possible between the three of us. In an effort to make the videos accessible, two of us submitted our videos for captioning by our university's Center of Online Learning and one of us prepared the captioning on their own.

In addition to the creation of the videos and notes, we also wrote a series of multiple-choice homework questions to be shared openly for each topic. These questions were used within our classes as pre/post quizzes and as additional practice problems.

Compiling this material into a one-stop location for our separate classes (and for sharing with others) was a challenge that our team overcame when Dr. Fang created [this website](#) for hosting our resources.

This project impacted our teaching by freeing up class time for more experiential learning for our students. Two of us took the opportunity to implement group activities into the class, despite the need for technology due to the pandemic. Activities included practice and application problems that groups worked to complete together. The experience was very positive from the instructor side, and we noted higher levels of engagement with the material than had we strictly lectured during class time. Students are often reluctant to work in groups, but once they settled into the routine, they benefited from the ability to openly discuss mathematical concepts with their peers in a less stressful setting.

Some of our work was impacted by the pandemic in unavoidable ways. Our efforts to transition online and then teach using new technology and platforms in the fall kept us busier than we anticipated. We learned that our self-prescribed deadlines had to be flexible to manage the many responsibilities we were unexpectedly handed in 2020. It was a challenge to plan and record videos on top of these responsibilities, but we did complete that work on time for implementation this spring.

Perhaps if we did anything differently for a future project, we might work together to plan the videos before recording them so that the tone is consistent for our students. We worked hard to create materials that showed the diverse nature of our faculty here at Columbus State, but it might have been a bit of a challenge for our students to adjust to three new teaching styles within one lower-level course. Some consistency in the source material might have elevated student outcomes.

Overall, having these videos gave us a lot of freedom and flexibility as instructors. Very importantly, we never had to be concerned about our students not having the funds to make a purchase to have access to the necessary materials. This is a huge relief as the affordability of materials seems to be becoming a bigger and bigger problem for our student population each semester. Additionally, having the video resources allowed us to flip our classrooms and offer more time for high-impact practices during our contact hours with the students.

2. Quotes

Provide three quotes from students evaluating their experience with the no-cost learning materials.

We asked open ended questions for the students to answer anonymously via Google Form. Some responses to the videos and content were positive:

“The ability to go back over materials much as you needed.”

“I liked having the videos on hand to rewatch and pause to take notes as I go.”

“I wouldn’t change anything.”

“Honestly, I thought this course was great, I’m used to doing math online so it really wasn’t that new to me. I really appreciated that the Powerpoint slides were uploaded along with the actual videos.”

There were some negative comments as well:

“Not being able to ask a live question.”

“I didn’t understand the content as well from the videos than I did in class.”

In some ways, the negative comments were more a critique on the flipped classroom learning environment, which is a challenge for students to overcome in a first year math course. There were no negative comments about having the material provided freely, which seemed to be appreciated by most (see measures below).

3. Quantitative and Qualitative Measures

A. 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: _____

- Positive: 94.6 % of 56 number of respondents
- Neutral: - % of number of respondents
- Negative: 5.4 % of 56 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)
- ☐ Neutral: Same performance outcomes over previous semester(s)
- ☐ Negative: Lower performance outcomes over previous semester(s)

We examined the student's progress in the course by looking at the grade distribution. Two faculty had used videos or partial OER in the year 2019 and 2020. So, we choose fall 2018 semester data to compare with spring 2021. Students have taken a survey comprising 12 questions about their perception of course for the spring 2021. According to the survey results, OER material was very useful for the students and their overall experience rate is very high.

Qualitative data shows students' success during spring 2021. However, it is very difficult to compare quantitative data because of COVID-19.

Fall 2018 N= 137 Students

%A's	%B's	%C's	%D's	%F's	%WF's	%W's
19.7	28.5	23.4	12.4	9.5	3.6	2.9

Spring 2021 N=135 students

%A's	%B's	%C's	%D's	%F's	%WF's	%W's
25.9	22.22	14.07	6.66	6.66	20.7	3.7

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.

31.1 % of students, out of a total 135 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)

B. Measures Narrative -SEE Attached Excel File

In this section, summarize the supporting impact data that you are submitting, including all quantitative and qualitative measures of impact on student success and experience. Include all measures as described in your proposal, along with any measures developed after the proposal submission.

[When submitting your final report, as noted above, you will also need to provide the separate file (or .zip with multiple files) of supporting data on the impact of your Textbook Transformation, such as surveys, analyzed data collected, etc.]

- *Include measures such as:*
 - *Drop, fail, withdraw (DFW) delta rates*
 - *Course retention and completion rates*
 - *Average GPA*
 - *Pre-and post-transformation DFW comparison*
 - *Student success in learning objectives*
 - *Surveys, interviews, and other qualitative measures*
- *Indicate any co-factors that might have influenced the outcomes.*

Unfortunately, COVID-19 played a major role in students' DFW rates. We have compared DFW's rate with the spring 2021 with fall 2018 and noted that DFW rate has been affected significantly, it almost doubled from fall 2018. We all know that the COVID-19 pandemic situation is beyond our control. We had a high WF due to the COVID 19 and online delivery method, therefore the course retention and completion rates are 93.5% and 75.5% in fall 2018 and spring 2021 respectively. The students' average GPA was 2.2 in fall 2018 and 2.1 in spring 2021 which was very close. The Survey questions results regarding COVID-19 pandemic's impact on student's study shows that it has affected their study negatively.

Because our in person sections were taught using the Extended Classroom model due to the circumstances surrounding the pandemic, student performance certainly suffered as a result. Many students struggled to adapt to the more virtual environment, had

technical difficulties, or were not able to effectively manage their time, and thus either dropped or were withdrawn from the class for inactivity/ lack of attendance.

Sustainability Plan

Describe how your project team or department will offer the materials in the course(s) in the future, including the maintenance and updating of course materials.

Because of the significant benefit of this project and the successful design of this course, we had a faculty member from the department adopt the material this semester in his section of MATH 1001, therefore our project actually covered 163 students and saved around \$16,300 on textbook costs. We are planning to recommend this material to all the faculty members in the department in the next a couple of semesters.

On the other hand, we are working on getting feedback from students and colleagues to improve the design of this course and better serve our students and faculty. Currently, we are using a combination of D2L and an independent online space. Students are required to receive the OER materials from the 3rd party site and take quizzes within D2L; we are planning to update our materials as needed to meet students' needs.

Additionally, we will share the experiences in this project through a variety of opportunities and encourage more faculty members to join us, such as other math courses and other departments as well.

4. Future Affordable Materials Plans

Describe any impacts or influences this project has had on your thinking about or selection of learning materials in this and other courses that you will teach in the future.

What we learned through this project:

- 1) Collaboration is key; this is especially important at this special time, without we three together, we cannot achieve this much successfully. Each of us worked part of this project and put them together as a great whole project.
- 2) Technology is an important helper. We created all the materials through different ways and put them together on our website. Tools such as YouTube, Vemo, Wix, Kaltura and other tools are very convenient and easy to use.
- 3) The beneficial aspects to the students are amazing. We roughly saved \$16,000 which is extremely encouraging. This also attracts more students planning to come back to school.
- 4) We are thinking of applying this to other courses, and we think this is worth the time and effort we spent.




5. Future Scholarship Plans

Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.

- 1) We have collected data, so we are thinking about publication.
- 2) We have plans to apply for next round or other grants to either improve the design for this course or apply for another course.
- 3) We are thinking that we need to share this experience with other colleagues to encourage more people to work on helping students.

6. Description of Photograph (optional)

This is where a team can list the names of the people shown in this separately uploaded photograph, along with their roles, if applicable.

	Dr. Houbin Fang, PI
	Dr. Nehal Shukla
	Ms. Elizabeth McInnis



Dr. Madhusudan Bhandary, the faculty who also adopted our materials in spring 2021