

## 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

<b>Date</b>	<b>October 7, 2020, Edited and Resubmitted April 1, 2021</b>
<b>Grant Round</b>	13
<b>Grant Number</b>	415
<b>Institution Name</b>	Georgia Institute of Technology
<b>Project Lead, PI</b>	Aselia Urmanbetova, Associate Academic Professional, School of Economics, aselia@gatech.edu
<b>Team Member: Co-PI</b>	Chaohua Ou, Assistant Director, Learning & Technology Initiatives, Center for Teaching and Learning, cou@gatech.edu
<b>Team Member</b>	

**Date:** October 7, 2020 (Edited and Resubmitted April 1, 2021)

**Grant Round:** 13

**Grant Number:** 415

**Institution Name(s):** Georgia Institute of Technology

**Project Lead:** Aselia Urmanbetova, Associate Academic Professional, School of Economics, Georgia Institute of Technology, [aselias@gatech.edu](mailto:aselias@gatech.edu).

**Team Members (Name, Title, Department, Institutions if different, and email address for each):**

1. Chaohua Ou, Assistant Director, Learning & Technology Initiatives, Center for Teaching and Learning, [cou@gatech.edu](mailto:cou@gatech.edu).
2. Krystin Gollihue, Marion L. Brittain Postdoctoral Faculty, Literature, Media & Communication, [kgollihue3@gatech.edu](mailto:kgollihue3@gatech.edu).
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10. Xin Gu, Ph.D. Candidate, School of Economics, [xgu78@gatech.edu](mailto:xgu78@gatech.edu).

**Course Name(s) and Course Numbers:** Principles of Macroeconomics, Econ 2105

**Semester Project Began:** Fall 2019

**Final Semester of Implementation:** Fall 2020

**Total Number of Students Affected During Project:** 800 - 1,000 students per year

**Interactive Textbook Link:** <https://intromacro.econ.gatech.edu/>

## 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**

The main goals of the project were to:

1. Lower overall costs for students who take ECON 2105, which is a requirement for most of the majors at the Georgia Institute of Technology.
2. Transform the current Openstax textbook into an interactive online textbook with self-guided study features, videos, and make it available to all students (not just to the students of the Georgia Institute of Technology).
3. Improve the overall satisfaction of the course materials and course.

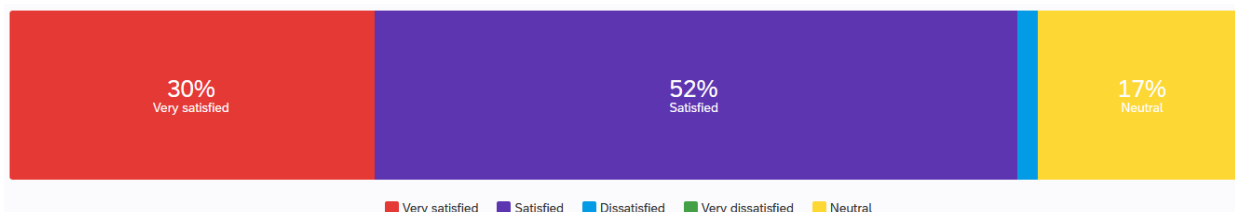
Given student survey results and the preliminary review of the peers, all three goals have been achieved. Since the first adoption of the Openstax textbook in 2018, the total course enrollment included 1,799 students. The following table approximate total possible savings depending on which version of the traditional textbook students would have opted to use.

New Paperback	\$491,702.68
Used Paperback	\$215,430.25
eTextbook	\$143,902.01
Rent	\$46,953.90

The textbook can be found here: <https://intromacro.econ.gatech.edu/>. It consists of five modules that are readily incorporated into Canvas, the learning management system (LMS) used by Georgia Tech. The website has a responsive design and students can read the book from their mobile devices. What is even better is that students can [download the book as an app](#) on their devices for offline reading.

Students have reported high satisfaction of using the interactive textbook. The following are the survey results of student satisfaction of using the textbook as well as a few quotes.

### Student Survey Satisfaction Results (N=183):



### **Student Survey Satisfaction Quotes:**

1. "I love how the textbook is so interactive and really reinforces the lectures. I think it is one of the best textbooks for a class I have ever had due to its interactions, information, and questions it provides."
2. "The textbook is a nearly perfect source for learning the info and has helped me a lot."
3. "I like the animated features in the textbook, making it more interesting to read."
4. "The fact that it has videos in the Chapters themselves to watch as you read."
5. "Its content layout with clear outlines and sections – this gives me a good idea of the material that will be covered and lets me track my progress within a chapter."
6. "I found the in-text questions after a section to be the most useful to understand the material after I read it."
7. "I think all the practice questions are the most helpful because you can't tell if you understand a concept until you apply it."
8. "Practice questions at the end of the section with explanations for why each answer is wrong or right."

- **Transformative impacts on your instruction**

The book went through a major restructuring of the content. Because we broke down the textbook into five modules, eliminated the chapter on elasticity, moved Appendix B (Aggregate Income-Expenditure Model) into the main body of the textbook, and moved the chapter on Exchange Rates to the fifth module focusing on the Open Macroeconomy, the flow of lectures is going much smoother for the Instructor (Urmanbetova). In addition, being able to embed the textbook directly into the course LMS helps the instructor with moving the modular content for the course.

- **Transformative impacts on your students and their performance**

The teaching methodology used in Econ 2105 by Urmanbetova is student-centric and adaptive and historically it had low DFW rates. However, the adaptation of the interactive textbook lowered even the historically low DFW from 1.6% in the Spring 2020 to 1.4% in the Fall of 2020, which is a 12.5% decrease. Additionally, the proportion of students with non-passing grades (D-F) decreased by 43.8%.

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

The main learning lesson for the Lead PI and instructor for the course is to have another additional instructor who is familiar with the content of the course as a contributor and not graduate students. The hardest part of the project was the editorial work, adapting assessments and creating question hints of for the review questions for each chapter, all of which were too difficult for graduate students.

**2. Quotes**

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

- The textbook was extremely useful during my time in Econ2105. The fact that it was free was extremely beneficial to me, considering I have to pay out of pocket for textbooks (Fall 2018).
- I love that the textbook is free and for a free resource it is very helpful (Fall 2020).
- That it was free, followed up by the study resources such as the review questions (Fall 2020).

**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: 284

- Positive: 81 % of 183 number of respondents
- Neutral: 17 % of 183 number of respondents
- Negative: 1.6 % of 183 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)

### **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.*

1.4 % of students, out of a total 284 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)
- ☐ Negative: This is a higher percentage of students with D/F/W than previous semester(s)

### **3b. Measures Narrative**

*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.*

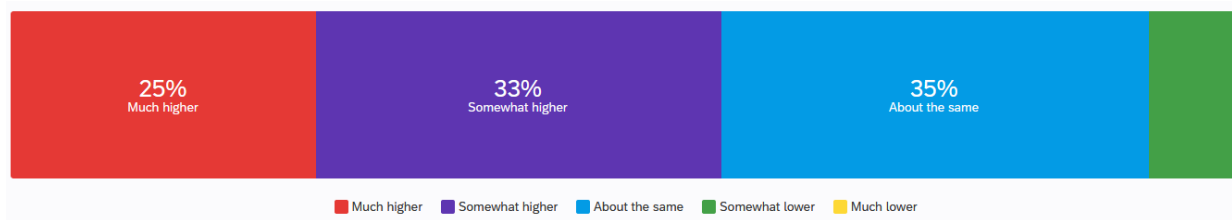
*[When submitting your final report, as noted above, you will also need to provide the separate file (or .zip with multiple files) of supporting data on the impact of your Textbook Transformation, such as surveys, analyzed data collected, etc.]*

- **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*

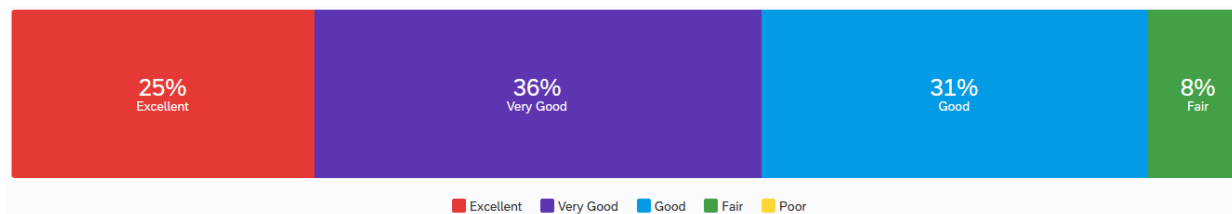
The original teaching methodology used in Econ 2105 by Urmanbetova is student-centric and historically it had low DFW rates. However, the adaptation of the interactive textbook lowered even the historically low DFW from 1.6% in the Spring 2020 to 1.4% in the Fall of 2020, which is a 12.5% decrease. Additionally, the proportion of students with non-passing grades (D-F) decreased by 43.8% from Spring 2020 to Fall 2020. Notably, although the first adaption of the open textbook in Spring 2018 was not covered by this grant, there was a remarkable decrease in the DRW rate from 7.34% in Spring 2018 to 1.46% in Fall 2018, which is an 80% drop.

In addition to the survey focusing on the textbook, the instructor conducted an overall satisfaction with the course materials and course. The following are the survey responses to these two questions:

1. Please rate the quality of instructional material relative to a typical class (N=161):



2. Considering everything, how would you rate the overall effectiveness of ECON-2105? (N=163)



- ***Indicate any co-factors that might have influenced the outcomes.***

The main co-factor that influenced 2020 results is the sudden transition of the traditionally-taught course into a remote asynchronous. In addition, both students and professors have been continuously encouraged to practice leniency and flexibility in assessment, activity scheduling, and grading.

Included with the report are the following files:

01. Qualtrics Survey Instrument: The original survey instrument was anonymously distributed via Qualtrix to students in the last month of the semester. The survey consisted of 25 questions and includes the invitation letter and consent form.
02. Qualtrics Survey Results Report: The report includes original data presented via Qualtrix reporting visualizations as well as simple listing in the case of open-ended questions.
03. Qualtrics Survey Results Data CSV: Reported data summarized in the CSV format.
04. Summative Analyses of DFW Rates: Summative analyses of the DFW rates for two open source textbook adoptions:
  - a. Adoption of the original Openstax in 2018: comparing pre-adoption DFW rates in Spring 2018 and adoption DFW rates in Fall 2018;
  - b. Adoption of the interactive textbook in 2020: comparing pre-adoption DFW rates in Spring 2020 and adoption DFW rates in Fall 2020.
05. Additional Survey Results.

#### **4. 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.***

The Lead PI (Urmanbetova) will continue editorial work of the textbook. There are a number of issues that we have encountered once we deployed the textbook:

- Chapter 9 needs additional Review Questions.
- All other chapters could use more Review and Self-check Questions.
- Chapter 10 needs editorial work.

The Lead PI (Urmanbetova) also has applied for and received the Mini Grant to import existing test bank question into an LMS system that can be shared together with the textbook LMS cartridge among instructors. In addition to the existing test bank questions (Urmanbetova) will add activities focused on data literacy and student interaction (FRED, FREDcast).

In addition, student survey responses indicate that adding such features as bookmarking, annotating, searching, and more practice questions (because they are good!) would be a great addition to the textbook. We will continue enhancing the interface of the book as we get more



feedback from students in the future. We also welcome feedback from educators and students from other institutions.

## 5. Future 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.***

Since the first adoption of the Openstax textbook, the instructor is committed to no-/low-cost course materials and active learning platforms. There are many OER and low-cost alternatives that enable instructors to deliver high-quality content without forcing students to pay up to \$300 in textbook costs for an introductory course. The instructor will be using another open source textbook for ECON 2101, Global Economics.

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

We have successfully presented at the following conferences:

- 2020 10th Annual Conference on Teaching & Research in Economic Education (CTREE) (cancelled), “Using Open Textbooks in a Large-enrolment Economics Courses,” May 27–29, 2020 Chicago, IL.
- 2020 Open Education Conference Presentation (virtual), “Redesigning an Open Textbook by Leveraging Media, Pedagogy, and Student Collaboration”, November 10, 2020.
- 2020 90th Annual Meeting of the Southern Economic Association (online), “Using and Redesigning Open Textbook in Principles of Macro”, November 22, 2020.
- 2021 Midwest Economics Association’s Annual Meeting, “Using Interactive Open Textbooks in a Large Enrolment Economics Courses”, online, March 22, 2021.

We are currently working on the instructional paper to be submitted to one of the Econ Ed journals by the end of December 2021.

## 6. Description of Photograph

- *On the Final Report Submission page, you will be submitting a photo. In this document, list the names of the people shown in this separately uploaded photograph, along with their roles.*



We included all the team members to the picture (from the top row to the right):

1. Aselia Urmanbetova, PI, Instructor and Subject Matter Expert
2. Chaohua Ou, Co-PI, Learning Design Lead
3. Krystin Gollihue, Team Member, Copy Editing
4. Elena Antoniadou, Team Member, Content Review
5. Kunal Dhodapkar, Team Member, Learning Design
6. Leonard Thong, Team Member, Learning Design
7. Nicole Imhof, Team Member, Assessment Design
8. Rochan Madhusudhana, Team Member, Web Design
9. Sophie Zhang, Team Member, Web Site Graphic Design
10. Yushuo Yang, Team Member, Content Review
11. Xin Gu, Team Member, Assessment Review