



Textbook Transformation Grants, Round Thirteen
(Spring 2019 –Spring 2020)
Proposal Form and Narrative

Notes

- The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.
- The only way to submit the official proposal is through the online form in Georgia Tech's InfoReady Review. The link to the online application is on the [Round 13 RFP Page](#).
- The italic text we provide is meant for clarifications and can be deleted.

Applicant, Team, and Sponsor Information

The **applicant** is the proposed Project Lead for the grant project. The **submitter** is the person submitting the application (which may be a Grants Officer or Administrator). The submitter will often be the applicant – if so, leave the submitter fields blank.

Institution(s)	Georgia Institute of Technology
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Applicant Position/Title	Associate Academic Professional
Submitter Name	
Submitter Email	
Submitter Phone #	
Submitter Position	

Please provide the first/last names and email addresses of all team members within the proposed project. Include the applicant (Project Lead) in this list. Do not include prefixes or suffixes such as Ms., Dr., Ph.D., etc.

	Name	Email Address
Team Member 1: Instructor or Record – Content /	Aselia Urmanbetova	aselia.urmanbetova@gatech.edu

	Name	Email Address
Assessment Revision and Oversight		
Team Member 2: Project Assessment, Multimedia and Web Development Oversight	Chaohua Ou	cou@gatech.edu
Team Member 3: Graduate Student Assistant - Course Assessment Development	Xin Guo	xgu78@gatech.edu
Team Member 4: Graduate Student Assistant - Course Content Development	To be identified	To be identified
Team Member 5: Graduate Student Assistant – Multimedia Development	To be identified	To be identified
Team Member 6: Student Assistant - Web Development	To be identified	To be identified

Please provide the sponsor's name, title, department, and institution. The sponsor is the provider of your Letter of Support.

Laura Taylor Professor, School Chair School of Economics Georgia Institute of Technology

Project Information and Impact Data

Title of Grant Project	Transforming an Open Introductory Economics Textbook with Improved Content and Assessment
Type of Grant	Large-Scale Transformations
Requested Amount of Funding	\$30,000

Course Names and Course Numbers	Principles of Macroeconomics, ECON2105
Final Semester of Project	Spring 2020
Average Number of Students Per Course Section Affected by Project	200
Average Number of Sections Affected by Project in One Academic Year	5
Total Number of Students Affected by Project in One Academic Year	800
Average Number of Students Affected per Summer Semester	50
Average Number of Students Affected per Fall Semester	400
Average Number of Students Affected per Spring Semester	400
Title/Author of Original Required Materials	<i>Principles of Macroeconomics</i> by Karl E. Case, Ray C. Fair, Sharon E. Oster (12 th edition)
Original Total Cost Per Student	Paperback (\$249), eTextbook (\$160)
Post-Project Cost Per Student	No cost to students
Post-Project Savings Per Student	\$160 - \$249
Projected Total Annual Student Savings Per Academic Year	\$136,000 - \$211,650
Using OpenStax Textbook?	Yes

Narrative Section

1. Project Goals

This project has four major goals:

1. We will adopt, adapt, and further develop an open textbook from Openstax at no cost to 850 students who take the class, ECON-2105: Principles of Macroeconomics, every academic year at Georgia Tech.
2. We will design, develop, and deliver open-source, online, and interactive multimedia learning materials to supplement the textbook and help student learn more effectively.
3. We will develop an online test bank that better assesses learning outcomes of the course.
4. We will assess student usage of the textbook and the supplementary learning materials as well as their effects on student learning.

2. Statement of Transformation

Statement of the Problem

ECON-2105 – Principles of Macroeconomics is one of the four required economics courses offered at Georgia Tech. It introduces students to the fundamental concepts in economics with the focus on the aggregate behaviors of market, national and international economics. About 850 undergraduate students take this course every academic year. The cost of the required textbook ranges from \$160 (eTextbook) to \$249 (paperback).

In order to reduce the high cost of the textbook for students, we piloted using an Openstax textbook, *Principles of Macroeconomics 2e*, in Fall 2018. At the end of the semester, we conducted a survey among students to assess their usage of the textbook, their satisfaction with the textbook, and any improvement they would suggest be made. Among the 318 students who took the course, 257 completed the survey and the response rate was 80%. Results of the survey indicated the respondents very much appreciated that the textbook is free and 84% of them said they were very satisfied or satisfied with the textbook content. However, when asked how they used various supplementary resources of the book, about 30% of them never used the resources. For those who used the resources, only about 50% found them very useful or useful. When asked what could be done to improve the textbook, their responses reveal the following major issues they wish could be addressed:

1. Discussions on some course topics could be too verbose and lengthy;
2. Some book chapters comprise predominantly text and plain graphs, which are neither easy to absorb nor engaging;
3. There are not sufficient relevant examples explaining the course concepts;
4. There are not sufficient practice questions at the end of each book chapter.

The feedback from the students resonates with the observations from the instructor and two teaching assistants. In addition, they found the following issues need to be addressed as well:

5. The book covers too much redundant information and using it as it is does not exactly align with the learning objectives of the class;
6. The questions from the test bank that comes with the textbook do not accurately assess the learning outcomes of the course;
7. There are discrepancies between book chapters and lecture slides provided due to a lack of discussion or complete omission of critical information in the slides.

Statement of the Transformation

As discussed above, the feedback from the students, the instructor, and TAs who participated in the OpenStax textbook pilot in ECON-2105 at Georgia Tech has indicated the textbook needs improvement in both content and assessment. This proposed project will transform the textbook by: (1) revising the content to make it better aligned with the course learning objectives; (2) integrating interactive multimedia learning materials to better engage students and facilitate their learning; and (3) developing assessment to help students reinforce their learning and achieve the intended learning outcomes.

The transformation of the textbook will make it possible that a high-quality textbook will be available free to all 850 students who take the course every year at Georgia Tech. According to our survey, the students who took the course in Fall 2018 spent an average of \$235 on their textbooks for the semester, with four students reporting a maximum cost of \$1,000. Given the cost of the commercial textbook for the course ranges from \$160 (eTextbook) to \$249 (paperback), the average textbook costs for the students would be double if the free textbook were not used. The impact of the additional costs on students could be considerable because, (1) the overall Georgia Tech in-state tuition increases by almost 85% between 2008 and 2017,¹ and, (2) 54% of the students relied on student loans, family, or themselves to pay for their education. This has been confirmed by students' responses to the survey. When asked about the impact of free textbooks on their ability to afford college, 37% of the students said the impact was significant and another 37% said the impact was moderate.

The financial savings enabled by this transformation not only make education more affordable to students but also could have a significant impact on their long-term college experience. The use of OER is found to significantly impact students' completion of courses, class achievement, and enrollment intensity during and after semesters in which OER were used (Fisher, Hilton, Robinson, & Wiley, 2015).

Another impact of the transformation is that it will make significant contribution to improvement and development of an existing OpenStax textbook, and potentially make it more adoptable. A report released most recently on a survey among over 4,000 faculty and

¹ The Chronicle of Higher Education collects and maintains inflation-adjusted tuition costs for more than 3,000 colleges (<https://www.chronicle.com/interactives/tuition-and-fees>). Percentage changes for the Georgia Institute of Technology are done by the authors.

department chairpersons on using OER indicates that they believe the high cost of course materials has a negative impact on students, but only 13% of the faculty reported using OER as required course materials and perceived lack of quality options is holding back growth in OER usage (Seaman & Seaman, 2019). Free or open textbooks do not necessarily meet the faculty's needs as 47% of them require articles and case studies for their courses, 37% for online homework system, and 28% for video or film (Seaman & Seaman, 2019). The learning materials we are to develop for this proposed project will address these needs by providing additional useful student and instructor resources to those who already adopted the book. To instructors who are considering adopting the book but have the same concerns and needs as ours, these resources could potentially make their adoption decision easier.

3. Transformation Action Plan

With support from Affordable Learning Georgia, we will be able to make transformation by revising and improving the content and assessment of the OpenStax textbook, *Principles of Macroeconomics*. All content will be open-access and licensed CC-BY (Creative Commons – by attribution). Below is a summary of the transformation action plan that addresses the seven issues related to the textbook:

1. Eliminating redundant discussions and adding more visuals such as concept maps, graphics, and diagrams to illustrate the explanation if possible
2. Adding more interactive multimedia learning materials such as video tutorials, demonstrations, and simulations to help explain course concepts
3. Adding more examples or case studies relevant to the current economics to help students bridge theoretical knowledge with real-life applications
4. Adding more practice questions and provide feedback for practice to reinforce learning
5. Curating course content from the textbook and other resources to align with each learning objective of the course
6. Developing an online test bank with questions in various formats for in-class polling, self-assessment, and quizzes, and providing automated feedback to students' responses to the questions
7. Redesigning the presentation slides by covering the critical information from the textbook while making them visually-appealing and engaging

Team Members and Roles

To execute the above transformation action plan and to achieve the project goals, we need to form a team that comprises of subject matter expert, content and assessment developer, multimedia and web developer, instructional designer, and project evaluator. We are requesting funds to support the efforts of the following six team members for this proposed project:

1. **Dr. Aselia Urmanbetova** – Dr. Urmanbetova is the instructor of record for ECON-2105 and subject matter expert, and she will oversee the textbook content and assessment revision. She will make decisions on curating content to align with the course learning

objectives, redesigning course presentation slides, and developing the online test bank for the course assessment.

2. **Dr. Chaohua Ou** – Dr. Ou is the Assistant Director of Learning & Technology Initiatives in the Center for Teaching and Learning. She will oversee the design and development of the interactive multimedia learning materials, as well as a web site that provides open access to the materials. She will also work with Dr. Urmanbetova to develop quantitative and qualitative measures for the project evaluation.
3. **Xin Guo** – graduate student assistant for assessment development. Xin will assist Dr. Urmanbetova in developing the online test bank.
4. **Ian Helfrich** – graduate student assistant for content development. Ian will assist Dr. Urmanbetova in curating, revising, creating, and reviewing the course content and presentation slides.
5. **Graduate Student Assistant** for multimedia development (to be named); the student assistant will assist Dr. Ou in the multimedia development.
6. **Graduate Student Assistant** for web development (to be named); the student assistant will assist Dr. Ou in the web development.

4. Quantitative and Qualitative Measures

We will measure the impact of the project by collecting data on students' usage of the textbook and learning materials, students' satisfaction with them, students' performance, and course-level retention.

We will package the textbook chapters with related supplemental learning materials into SCORM modules. SCORM stands for Shareable Content Object Reference Model and content modules in SCORM format can be distribute to a variety of learning management systems (LMSs). Students' usage of the content, and any interaction activities, including their responses to practice questions, will be tracked in the LMS. We will house these modules in our LMS and collect the data, which will provide us insights into how students use the textbook and the learning materials.

We will formally survey students in Spring 2020 on students' satisfaction with the textbook and learning materials. We have obtained IRB approval (protocol H18415) for the survey we conducted in Fall 2018 on students' satisfaction with the OpenStax book. Both Likert-scale questions and open-ended questions were included in the survey to generate quantitative and qualitative data. We will use the same protocol but will submit amendments for approval on modified survey questions.

We will compare course grades and DFW rates pre- and post-transformation to determine if content and assessment materials are more effectively help student succeed in the course.

5. Timeline

Summer 2019

- Curating content from the OpenStax textbook and other resources that align with the course objectives
- Designing and developing visuals for the content
- Redesigning course presentation slides
- Developing an online test bank

Fall 2019

- Designing and developing interactive multimedia supplementary materials
- Designing and developing a web site to present the learning materials

Spring 2020

- Offering ECON-2105 with the improved textbook, the newly-developed learning materials, and the test bank
- Collecting data on students usage, student satisfaction, and student performance

6. Budget

- Release time for Dr. Urmanbetova - \$4,867
- Release time for Dr. Ou - \$4,867
- Salary for Xin Guo: \$4,867 - Xin will be hired to work 12 hours a week for 17 weeks during Summer 2019 with an estimated hourly pay of \$24
- Salary for three graduate student assistants for (1) content, (2) multimedia and (3) web development: \$14,600 – each of them will work 12 hours a week for 17 weeks during Fall 2019 with an estimated hourly pay of \$24
- Travel to ALG kickoff meeting for 2 - \$100
- Other overall project expenses - \$700
- Total funds requested: \$30,000

7. Sustainability Plan

ECON-2105 is offered every Fall and Spring semester. There are fewer sessions in the summer. The improved textbook, the multimedia learning resources, and the test bank will be used in all future offerings of the course. The content and assessment materials will be housed in the learning management system and an open-access web site at Georgia Tech. They are easy to maintain, modify, and update.

We will assess the effectiveness of the textbook and the learning materials on student learning. We will develop a workshop for faculty at Georgia Tech to share our experiences with the design and development of the open educational resources (OER). We will also submit a proposal to a national or international conference to share our experiences with the OER community.

References

- Fischer, L., Hilton, J., Robinson, T. J., & Wiley, D.A. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education*, 27(3), 159-172.
<https://doi.org/10.1007/s12528-015-9101-x>
- Seaman, J.E., & Seaman, J (2019). *Freeing the Textbook: Educational Resources in U.S. Higher Education, 2018*. Babson Survey Research Group. Retrieved from
<https://www.onlinelearningsurvey.com/reports/freeingthetextbook2018.pdf>