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# Application Summary

## Competition Details

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<b>Competition Title:</b>	Textbook Transformation Grants, Round Thirteen (Spring 2019-Spring 2020)
<b>Category:</b>	University System of Georgia
<b>Award Cycle:</b>	Round 13
<b>Submission Deadline:</b>	01/14/2019 at 11:59 PM

## Application Information

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<b>Submitted By:</b>	Aselia Urmanbetova
<b>Application ID:</b>	2878
<b>Application Title:</b>	415
<b>Date Submitted:</b>	01/15/2019 at 7:34 AM

## Personal Details

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<b>Institution Name(s):</b>	Georgia Institute of Technology
<b>Applicant First Name:</b>	Aselia
<b>Applicant Last Name:</b>	Urmanbetova
<b>Applicant Email Address:</b>	aselia.urmanbetova@gatech.edu
<b>Applicant Phone Number:</b>	(678)-431-5013
<b>Primary Appointment Title:</b>	Associate Academic Professional
<b>Submitter First Name:</b>	Aselia
<b>Submitter Last Name:</b>	Urmanbetova
<b>Submitter Email Address:</b>	aselia.urmanbetova@gatech.edu
<b>Submitter Phone Number:</b>	(678)-431-5013
<b>Submitter Title:</b>	Associate Academic Professional

## Application Details

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### Proposal Title

415

### Final Semester of Project

Spring 2020

### Requested Amount of Funding

\$30,800

### Type of Grant

Scaling Up OER

**Course Title(s)**

Principles of Macroeconomics

**Course Number(s)**

ECON2105

**Team Member 1 Name**

Aselia Urmanbetova

**Team Member 1 Email**

aselia.urmanbetova@gatech.edu

**Team Member 2 Name**

Chaohua Ou

**Team Member 2 Email**

cou@gatech.edu

**Team Member 3 Name**

Xin Guo

**Team Member 3 Email**

xgu78@gatech.edu

**Team Member 4 Name**

Ian Helfrich

**Team Member 4 Email**

ian@gatech.edu

**Additional Team Members (Name and email address for each)**

Team Member 5 (Name and Email to be identified)

Team Member 6 (Name and Email to be identified)

**Sponsor Name**

Laura Taylor

**Sponsor Title**

Professor, School Chair

**Sponsor Department**

School of Economics, Georgia Institute of Technology

**Original Required Commercial Materials (title, author, price)**

Principles of Macroeconomics by Karl E. Case, Ray C. Fair, Sharon E. Oster (12th edition), Paperback (\$249), eTextbook (\$160).

**Average Number of Students per Course Section Affected by Project in One Academic Year**

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

**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

**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.

**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:

1. The book covers too much redundant information and using it as it is does not exactly align with the learning objectives of the class;
2. The questions from the test bank that comes with the textbook do not accurately assess the learning outcomes of the course;
3. 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,<sup>[1]</sup> 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 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.

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[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.

## **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.

#### **Quantitative & 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 distributed 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 more effectively help students succeed in the course.

## **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

## **Budget**

- Release time for Dr. Urmanbetova - \$5,000
- Release time for Dr. Ou - \$5,000
- Salary for Xin Guo: \$5,000 - Xin will be hired to work 12 hours a week for 17 weeks during Summer 2019 with an estimated hourly pay of \$25
- Salary for Ian Helfrich: \$5,000 - Ian will be hired to work 12 hours a week for 17 weeks during Summer 2019 with an estimated hourly pay of \$25
- Salary for two graduate student assistants for multimedia and web development: \$10,000 – each of them will work 12 hours a week for 17 weeks during Fall 2019 with an estimated hourly pay of \$25
- Travel to ALG kickoff meeting for 2 - \$800
- Total funds requested: \$30,800

## **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.

## **Acknowledgment**

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### **Grant Acceptance**

[Acknowledged] I understand and acknowledge that acceptance of Affordable Learning Georgia grant funding constitutes a commitment to comply with the required activities listed in the RFP and that my submitted proposal will serve as the statement of work that must be completed by my project team. I further understand and acknowledge that failure to complete the deliverables in the statement of work may result in termination of the agreement and funding.

Dr. Laura Taylor, Professor and Chair  
School of Economics  
Atlanta, Georgia 30332, USA  
Phone: (404) 385-1363  
Email: [laura.taylor@gatech.edu](mailto:laura.taylor@gatech.edu)

January 3, 2019

Affordable Learning Georgia [ALG@gatech.edu](mailto:ALG@gatech.edu)  
To Whom It May Concern:

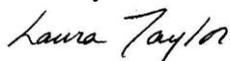
The School of Economics strongly supports the Transformation-at-Scale proposal for the ALG Textbook Transformation Grant by Dr. Aselia Urmanbetova. In the fall of 2018 Dr. Urmanbetova has successfully adopted an open source textbook for our Econ 2105 Principles of Macroeconomics course. This effort serves as an important part of transformation of our introductory economics courses towards more open learning modalities such as Massive Open Online Courses (MOOC).

The funds from this grant will be used to provide release time and dedicated help from the Assistant Director of Learning and Technology Initiatives at Georgia Tech's Center for Teaching and Learning, Dr. Chaohua Ou, and the team of four graduate research assistants who will support the re-design and adaptation of the existing textbook content, multimedia assessment tools, and other interactive multimedia materials. These efforts will enable the project members to create the course web-based interface and all related materials as a suitable replacement for traditional textbooks and paid-for online assessment systems.

Upon successful completion, the course web-based interface can replace the commercial textbooks and online assessment systems and the School's Curriculum Committee(s) will be able to make an informed decision as to whether it is reasonable and beneficial to adopt this approach for all sections of this course, and to consider similar efforts for other introductory courses, such as Econ 2100, 2101, and 2106. The Georgia Tech server system will host these web pages.

The web pages will be open and freely available to other institutions in both Georgia and the rest of the world. They will be a highly visible part of Georgia Tech's leadership in the transformation of undergraduate economics education.

Sincerely,



Laura Taylor  
Professor and Chair

# Georgia Tech Center for Teaching and Learning

January 10, 2019

Affordable Learning Georgia

To Whom It May Concern:

I am writing this letter to support the ALG Textbook Transformation Grant proposal submitted by Dr. Aselia Urmanbetova and Dr. Chaohua Ou. As Director of Georgia Tech's Center for Teaching and Learning (CTL), I am pleased to have our Center support faculty who want to engage in Affordable Learning Georgia initiatives.

Dr. Ou is the assistant director of learning and technology initiatives in the Center for Teaching and Learning. She will work with Dr. Urmanbetova to adopt, adapt, and further develop an open textbook which will be available at no cost to the 850 students who take *ECON-2105: Principles of Macroeconomics* each year at Georgia Tech. This proposed project will significantly reduce the course cost for Georgia Tech students and will benefit instructors and students in other institutions as well. I strongly support this effort to make education more affordable and more accessible to students studying Economics.

The Center for Teaching and Learning partners with many campus units to provide and support projects that have a positive impact on student learning. Such initiatives include developing, scaling up the use of open educational resources (OER) in courses, and assessing their impact on student learning. Textbook cost can be a financial burden on students and affect student success. The many cost-saving benefits of OER are matched by the equally important pedagogical benefits. With our expertise in higher education pedagogy and educational technology, we work with instructors from various disciplines to design and develop learning materials that are customized for their courses and aligned with their learning objectives. We leverage technology to make the learning materials interactive and engaging, thus creating more meaningful learning experiences for students. Dr. Ou has extensive experiences in multimedia learning, instructional design, project management, and educational research. I am confident that she will make a significant contribution to the proposed project and its success.



Dr. Joyce Weinsheimer, Director

Phone: 404-894-2340 Email: [joyce.weinsheimer@gatech.edu](mailto:joyce.weinsheimer@gatech.edu)



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
Applicant Name	Aselia Urmanbetova
Applicant Email	aselia.urmanbetova@gatech.edu
Applicant Phone #	(404)-894-4910
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	<a href="mailto:aselia.urmanbetova@gatech.edu">aselia.urmanbetova@gatech.edu</a>

	Name	Email Address
Assessment Revision and Oversight		
Team Member 2: Project Assessment, Multimedia and Web Development Oversight	Chaohua Ou	<a href="mailto:cou@gatech.edu">cou@gatech.edu</a>
Team Member 3: Graduate Student Assistant - Course Assessment Development	Xin Guo	<a href="mailto:xgu78@gatech.edu">xgu78@gatech.edu</a>
Team Member 4: Graduate Student Assistant - Course Content Development	Ian Helfrich	<a href="mailto:ian@gatech.edu">ian@gatech.edu</a>
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
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Project Information and Impact Data

<b>Title of Grant Project</b>	Transforming an Open Introductory Economics Textbook with Improved Content and Assessment
<b>Type of Grant</b>	Large-Scale Transformations
<b>Requested Amount of Funding</b>	\$30,800

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

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1. Discussions on some course topics could be too verbose and lengthy;
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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;
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### **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,<sup>1</sup> 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

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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 - \$5,000
- Release time for Dr. Ou - \$5,000
- Salary for Xin Guo: \$5,000 - Xin will be hired to work 12 hours a week for 17 weeks during Summer 2019 with an estimated hourly pay of \$25
- Salary for Ian Helfrich: \$5,000 - Ian will be hired to work 12 hours a week for 17 weeks during Summer 2019 with an estimated hourly pay of \$25
- Salary for two graduate student assistants for multimedia and web development: \$10,000 – each of them will work 12 hours a week for 17 weeks during Fall 2019 with an estimated hourly pay of \$25
- Travel to ALG kickoff meeting for 2 - \$800
- Total funds requested: \$30,800

### 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.

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Seaman, J.E., & Seaman, J (2019). *Freeing the Textbook: Educational Resources in U.S. Higher Education, 2018*. Babson Survey Research Group. Retrieved from

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