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

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:

Grant Round: 12

Grant Number: 386

Institution Name(s): Kennesaw State University

Project Lead: Meng Han

Team Members:

Dr. Meng Han, menghan@kennesaw.edu

Dr. Guangzhi Zheng, gzheng@kennesaw.edu

Course Name(s) and Course Numbers:

IT 4203 Advanced Web Development,

IT 3203 Introduction to Web Development

Semester Project Began: Spring 2018

Final Semester of Implementation: Fall 2019

Total Number of Students Affected During Project: 80

1. Narrative

The transformation has been a smooth experience. Students in the sections with the implementation have generally meet class performance expectations, and achieved better performance than students in sections without the implementation. Students in the IT program are generally aware of the fast pace nature of the information technology industry. They understand that technologies are ever changing and things like textbooks can become obsolete the minute they are published. Most of them have already gotten used to the idea of searching the Internet for instructions, tutorials, and other learning resources. Some students are already aware of W3Schools, which is one of the primary open resources used for this transformation project, before taking the class. Substituting textbooks with free open online resources only comes as natural and logical to the students. Both of the two primary open online resources used in this transformation project, W3Schools and Codecademy, provide interactive features for students to practice online as they learn. Compared to traditional non-interactive content such as a textbook, this is a huge plus for students and is widely appraised by the students.

Using open online resources has certainly had an impact on the instruction. Instead of spending large amount of time preparing class notes and PowerPoint slides, the instructor was able to focus the energy more on student interaction, facilitation, and providing feedback to the students. It also allowed the instructor to allocate more time for students to do hands-on practices during the face-to-face sessions, which is essential for a programming class such as this one.

One of the challenges encountered during this transformation project had something to do with the different modalities of each section taught. In the face-to-face or hybrid section, students embraced the idea of being able to learn the concepts and materials from the different variety of online resources provided, and practice with them. While in the class, they have the opportunity to do hands-on practice and seek immediate guidance when they have questions or need help. However, in the fully online section, the class was taught asynchronously, which means online students did not receive the same type of immediate guidance or help as face-to-face students did. One-on-one sessions, virtual office hours, and over the phone consultations were held to help those students who reached out to the instructor, but generally the interactions are not as immediate as they would in the classroom. Although the challenges are not directly related to the open online resources used, providing students with more specific and customized instructions may potentially help mitigate the challenges facing the online students.

Overall, the success of this transformation project can largely attribute to the fact that today's students, especially the ones in the IT program, are open and accustomed to the idea of finding

and utilizing online resources. Also, the primary resources used in this project are well maintained and are kept up-to-day in a fashion that a traditional textbook cannot compete. They also offer interactivities for students to do hands-on practices, which is essential for a class such as web development.

One of the shortcomings of the two primary open resources used in this transformation project is that the knowledge points, or the concepts can appear to be scattered at times to the students. Part of the reason can be attributed to the website nature of these resources, as students can jump between different topics or concepts freely, thus loosing the "whole picture" or missing the "connection." Also, the open resources used in this project do not emphasize or pay special attention to some of the fundamental concepts or ideas such as fostering a good coding habit or how to properly debug an error. Based on the instructor's teaching experience, maintaining a good coding habit and skills to properly debug an error are fundamental and can benefit students more in the long term. For future semesters, additional instructional materials or tutorials may need to be created to help students "connect the dots" and help them develop debugging skills.

2. Quotes

- "The setup of this course is very good, learn the overview to the course."
- "The website provided by the course lead an interactive way of learning."
- "The material provided of this course was sufficient not only for the course but also the area."

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: __80_

- Positive: __86.67__ % of ___15_____ number of respondents
- Neutral: ___0____ % of ___15_____ number of respondents
- Negative: __13.33__ % of ___15_____ 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.

___5.8____% of students, out of a total __80__ 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.

Student performance comparison between sections with no-cost-to-students learning materials implemented and other sections.

Due to the updating of department curriculum, IT 4203 will be delayed offering in Spring 2020. A total of 3 sections of IT 3203 after the implementation in fall 2019 are included in the analysis. The sections with

implementations are higher in pass rate and lower in fail rate and withdraw rate. We will keep report the result of IT 4203

	# of sections	Pass Rate	Fail Rate	Withdraw Rate
Other sections	7	88.09%	7.62%	4.29%
Sections with implementation	3	93.75%	3.75%	2.5%

Student performance by grading items

The performance on each student work item meets the performance target (75%) except for Quiz 2 in Fall 2019 (the online class).

Grading Items	Average Score	
	Fall 2018	Fall 2019
Final exam	85%	87%
Quiz 1	88%	90%
Quiz 2	91%	88%
Quiz 3	92%	90%
Assignment 1	88%	95%
Assignment 2	94%	94%
Assignment 3	92%	92%
Assignment 4	90%	91%
Assignment 5	91%	92%

Survey results

Students are asked rate the following statements on a 5 point Likert Scale (5 means very satisfied or strongly agree). The means are reported here and show very positive feedback.

Statements	Mean
In general, the course materials were well selected and relevant.	4.33
The code examples and exercises have assisted me in acquiring the knowledge and skills of fundamental web development.	4.57
The assignments are relevant and test my knowledge of the module's content.	4.65
Please rate your satisfaction with the learning materials at W3Schools.	4.62
Overall, compare to a potential paid textbook, open resource learning materials provided in this course offer:	

Overall, compare to a potential paid textbook, open resource learning materials provided in this course offer well-presented and rich content to assist learning.	4.53
Overall, compare to a potential paid textbook, open resource learning materials provided in this course offer better delivery format (such as interactive step-by-step instructions, and online live code practice).	4.52
I support using the selected open resource learning materials than a paid textbook in the course.	4.21
I would use open learning materials rather than a paid textbook for learning web development.	4.17

4. Sustainability Plan

The IT4203 course will be expanded into IT 5443 Web Technologies and Application Development for MSIT students. The latest version of IT 5443 has been developed and approved as a distant learning course in spring 2019, and it will be offered starting spring 2020.

Dr. Han will remain as the course architect of IT 4203 and IT 3203 while Dr. Zheng will continue support the development of the web course of IT department at Kennesaw State University. As a course architect, the architect develops and maintains the course materials and teaching plans. Architect also teaches the course at least once a year to make sure all resources are valid and make necessary changes. The both PI Dr. Han and Dr. Zheng will teach these two courses every semester.

All course materials will be hosted in the learning management system Desire2Learn Brightspace for future enrolled students. They are also publicly accessible from Dr. Han and Zheng's personal website.

5. Future Plans

The project will have a long lasting impact on our course development and teaching in the future. We are now fully embracing low or no cost learning materials. We plan to try our best to use them in my future courses. We have already participated several ALG grants and hope to continue my experience and success.

More specific to this project, I plan to expand the materials used in this course to the introduction to web development course at the lower undergraduate level (IT3203) at an appropriate time. IT 3203 has an annual enrollment about 180. IT 4203 as an advanced topic course for web development has an annual enrollment about 120.

The project also prompted me to utilize some new interactive delivery methods, beyond static articles, books, video clips, compressed files, etc. For example, some online code playgrounds such as jsFiddle provide direct and interactive environment for code demonstration and access; systems like Codecademy and Google Oppia provide interactive step-by-step training and lab capabilities.

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.*

Dr. Meng Han (left)

Dr. Guangzhi (Jack) Zheng (right)