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)
    - o Qualtrics survey results (2 reports)
    - o Survey summary xls file
    - o Grade distribution file (from email)
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: **June 12, 2020**

Grant Round: **14**

Grant Number: **439**

Institution Name(s): **Columbus State University**

Project Lead: **Lydia Ray, Associate Professor at TSYS School of Computer Science**

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

- **Dr. Rania Hodhod, Associate Professor at TSYS School of Computer Science, hodhod_rania@columbusstate.edu**
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Course Name(s) and Course Numbers:
- **Computer Science II, CPSC 1302**
- **Intro to Information Security, CPSC 2106 (CYBR 2106 effective Fall 2019)**
- **Data Structures, CPSC 2108**

Semester Project Began: Summer 2019

Final Semester of Implementation: Spring 2020

Total Number of Students Affected During Project: 384

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*

One of the key outcomes of this project was the evaluation of OER resources for three lower-division computer science courses. Many resources were screened and dozens of materials were evaluated. An early challenge with this project was determining the criteria for evaluating OER resources. As we began to use our evaluation criteria, we refined it to make it more suitable and meaningful for ourselves and others. For CPSC 1302 (Computer Science II) and CPSC 2108 (Data Structures), we were able to find good textbooks that were entirely free of cost.

For CPSC 2108, the OpenDSA e-book we used in the data structures course was initially created in 2016 and modified in 2017. The book thoroughly covers the majority of our curriculum. It is a project sponsored by the U.S. National Science Foundation. We supplemented the OpenDSA book with the free-to-use CodeWorkout online training exercises from Virginia Tech, the Visualising Data Structures and Algorithms Through Animation (VisuAlgo) platform which is a free to use website developed at the National University of Singapore to teach data structures and algorithms, and some websites with free materials that describe implementations of data structures in the Java programming language.

For CPSC 2106 (Intro to Information Security) we were not able to find a single source that covered all the material in our curriculum and was free. Therefore, we gathered a selection of resources from various sites/organizations that aligned with part of our curriculum. For the remaining part, we used resources developed by us, mainly presentation slides and assessment instruments. Where appropriate and allowed, we made modifications on the resources we gathered so they fit well into our schedule.

One of the long lasting impacts for the instructors of this project is the realization of how many high quality materials are readily available to choose from. For future courses, our first choice will be to look for existing OER materials.

For our students, using OER materials removed the barrier of students being able to afford the textbook. Additionally, students enjoyed and utilized the ability to have their textbook more readily available, wherever they were. While performances of the students varied from course to course, overall, their performances were either improved or stayed neutral. In other words, with transformed resources, student performances did not decline. This is described in further details in Question #3.

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

One of the lessons learned while analyzing the first survey (December 2019) results was our desire to have the course (and even the class) of the respondent. We expanded the survey before administering it again (in May 2020). This allows us to more finely analyze the survey results.

One of the things that we would do differently next time would be to align our evaluation criteria with what students are looking for in a textbook.

2. Quotes

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

From CPSC 1302

"It was digital so I could access it anywhere, on any device as opposed to having to keep the physical book with me at all times. I could copy/paste from the digital book and create my own worksheets for the chapter exercises which is extremely efficient. And finally, it didn't require a tree to be cut down (or several) in order to make the digital book; sure there's a carbon footprint with anything, but it's nice to know that 'going green' is a better option in this case."

From CPSC 2106

"It is more in line directly with what is taught and required to understand, and had none of the unnecessary material that usually fills payed for books/texts."

From CPSC 2108

" It was interactive made sure you understood how a method worked before you moved on " ,

" It's a lot easier to access the reading and course materials through a link for each section, since everything I'm needing for schoolwork is on the computer already. " ,

"The online textbook was laid out in a manner that made it extremely easy to find the relevant material I needed to study"

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: 384

- Positive: 41.3% of 206 respondents
- Neutral: 35.8% of 206 respondents
- Negative: 11.2% of 206 respondents

- No response: 11.8% of 206 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)
- _x__ 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.

23.50% of students, out of a total 384 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)
- __x_ 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)

B. 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:*
  - o *Drop, fail, withdraw (DFW) delta rates*
  - o *Course retention and completion rates*

As is shown in the table below, the transformation did not have a significant impact on the completion and retention rates.

Grade	Pre	Post
Pass (A-D)	80.29	76.50
DFW (Drop, F,W,WF,W9)	19.71	23.50

- o *Average GPA*

The average GPA for students pre and post transformation are the same

Pre: 2.15

Post: 2.15

- o *Pre-and post-transformation DFW comparison*

See above (course retention and completion)

- o *Student success in learning objectives*

Even though the retention rates are similar before and after textbook transformation, the distribution of grades of those students who passed the class are slightly different. A higher percentage of students got Ds and Cs before the transformation whereas a higher percentage of students got As and Bs post transformation. This shows that students whom we have retained, they had a stronger understanding of the material. It is important to note that Spring 2020, the last semester of post transformation, had been severely impacted by Covid19. In spite of the impact of Covid19, we observe higher rates of As and Bs post transformation.

Grade Distribution of All Courses Before and After Textbook Transformation
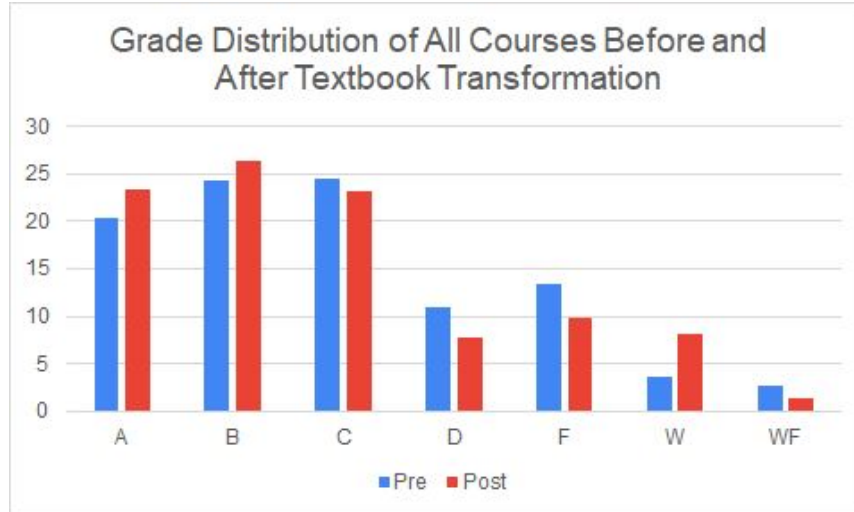
o   *Surveys, interviews, and other qualitative measures*
● *Indicate any co-factors that might have influenced the outcomes.*

● Covid19 has influenced the outcomes of Spring 2020.
● Overall enrollments dropped during the academic year 2019-2020. This explains why the actual total number of students impacted by the transformation (383) is lower than the projected number of students impacted by the transformation (435).

SURVEY RESPONSES

18. How would you rate the quality of the required materials (textbooks, articles, other written materials, or online resources) used for this course?

We have categorized choices for this item as:

"WORSE than the quality of the texts in my other courses": Negative
"About the SAME AS the quality of the texts in my other courses": Neutral
"BETTER than the quality of the texts in my other courses": Positive

	Negative	Neutral	Positive
Combined Fall 2019	7	57	17
CPSC 1302 (2020)	6	38	15

CPSC 2108 (2020)	0	10	8
CYBR 2106 (2020)	1	15	9
Total (%)	14 (6.8%)	120 (58.3%)	49 (23.8%)

22. How do you feel about the online format of the texts used for this course?

We have categorized choices for this item as:

"I like the online format LESS than traditional printed texts": Negative
"I have no preference": Neutral
"I like the online format MORE than traditional printed texts": Positive

	Negative	Neutral	Positive
Combined Fall 2019	15	23	40
CPSC 1302 (2020)	8	17	34
CPSC 2108 (2020)	1	5	12
CYBR 2106 (2020)	4	7	12
Total (%)	28 (13.6%)	52 (25.2%)	98 (47.6%)

24. Imagine a future course you are required to take. If two different sections of this course were offered by the same instructor during equally desirable time slots, but one section used texts similar to those used in this course and the other used traditional published texts, which section would you prefer to enroll in?

We have categorized choices for this item as:

"I would enroll in the section with TRADITIONAL PUBLISHED TEXTS": Negative
"I would have no preference": Neutral

"I would enroll in the section with RESOURCES LIKE THOSE OFFERED IN THIS COURSE": Positive

	Negative	Neutral	Positive
Combined Fall 2019	17	19	46
CPSC 1302 (2020)	5	20	34
CPSC 2108 (2020)	2	5	11
CYBR 2106 (2020)	3	5	17
Total (%)	27 (13.1%)	49 (23.8%)	108 (52.4%)

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.

Due to the success of the OERs we will continue to use them. The selected OERs have worked at least as good as the paid resources we used before, and based on the data so far the students seem to be responding well to the resources.

A survey will be sent to students taking CS2 during the Summer 2020 term, inquiring about their views on textbooks. The survey will include questions about their likelihood of reading a textbook based on certain factors (brevity, interactive components, examples, etc.). Those results will be used to evaluate future material selection for CS2 (from our existing evaluations) to best meet the needs of the students at our university.

5. 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.

One of the long lasting impacts for the instructors of this project is the realization of how many high quality materials are readily available to choose from. For future courses, our first choice will be to look for existing OER materials.

This project has given us the opportunity to understand better the different classes of OERs that may be used as well as resources to search for them that we did not know before starting this project.

The impact has been positive in the classes in which we introduced the OERs with students reporting at least the same experience on learning when comparing OERs to previous materials, with the difference of no-cost, which translates into savings.

6. 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.

We expect to publish results of this project in either a conference such as the ACM SIGCSE conference and/or journals related to education.

7. 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.