Affordable Learning Georgia Textbook Transformation Grants

Final Report

Instructions:
A. Your final report submission must include four separate component files:

1. Completed report form. Please complete per inline instructions. The italicized text is provided for your assistance; please delete the italicized text before submitting your report.
2. Course Outline document with links to the materials as used per day, week, or unit, organized chronologically. View Course Outline Example
   a. For each resource, give the title, author, Creative Commons licenses (if appropriate), and freely accessible URL to the material. Include all open-access links to all adopted, adapted, and newly created course materials.
3. Supporting data on the impact of your Textbook Transformation (survey, analyzed data collected, etc.)
4. A photograph of your team and/or your students for use in ALG website and materials.
   a. Photograph must be 800x600 pixels at minimum (length x height).
   b. Photograph must be taken together: individual team member photographs and website headshots not accepted.

B. Go to http://affordablelearninggeorgia.org/site/final_report_submission to submit these four components of your final report. Follow the instructions on the webpage for uploading your documents. You will receive a confirmation email. Based on receipt of this report, ALG will process the final payment for your grant. ALG may follow up with additional questions or to request your participation in a publication, presentation, or other event.

Date: 2016/8/11
Grant Number: 132
Institution Name(s): Georgia Tech
Team Members (Name, Title, Department, Institutions if different, and email address for each): Jung Choi, Shana Kerr, Chrissy Spencer
Project Lead: Spencer
Course Name(s) and Course Numbers: BIOL 1510, BIOL 1511
Semester Project Began: Summer 2015
Semester(s) of Implementation: Fall 2015, Spring 2016, Summer 2016, continuing
Average Number of Students Per Course Section: Fall 250, Spring 175, Summer 40
Number of Course Sections Affected by Implementation: 1 per semester

Total Number of Students Affected by Implementation: 942 to date

1. Narrative

We developed and delivered streamlined, on-line, open-source course materials (text, video, interactives, and online homework) that better align to the student learning goals in our introductory biology sequence than textbooks previously in use and substantially lowered costs to the student. Assessment based on student usage of the web content, comments on the web pages and performance on formative embedded quiz questions have enabled instructors to revise and refine the web pages in a just-in-time fashion to facilitate student learning. This project impacted approximately 500 students in the implementation academic year and will continue its impact in future academic years.

In Biology 1510, the open-source course materials implementation allowed us to teach effectively, showed no declines in student learning, with a slight trend toward increase from the previous Fall semester using the traditional textbook. Pre- and post-implemetnation cohorts had roughly similar DFW rates for Fall and Spring semesters. Because Biology 1511, our smaller majors-only section, only partially implemented the open-source course materials and still required a textbook, results from that course will not be reported further in this report.

Development of the course materials to the standard of quality we required was very time consuming, and required additional buyout beyond what the ALG grant provided. We needed to seek out additional funding to do the project at a reasonable effort to compensation ratio. For each semester of implementation, we modified our student feedback format and finally determined that the most effective form of feedback for each webpage entry is student free response answering “What in the webpage reading for today needed additional explanation?”, timed at the end of the lecture hour following each reading.

2. Quotes

In response to “What specific things would you KEEP about this course, and why?”

Spring & Summer 2017

• No quotes collected.
Fall 2016 (webpage content was presented in an alternate configuration in this semester)

- I like that there is no actual textbook, the webpage makes it easier to understand, also the practice tests were super helpful
- I like the online readings, but I wish some pages were improved.
- I liked the website as a resource. very organized.
- I love having the webpage versus a textbook; the webpage is more concise and all in one location. I felt it was easier to manage.
- I really liked that the information was all on the website and there were good videos to go with the topics. Learning catalytics was also very useful, especially when reviewing for exams.
- Reading the website before class, it helped me understand the material before jumping into it
- The bio1510 website was extremely helpful, especially the list of learning objectives to use as a guideline for learning.
- The biology website pages and videos embedded in them.
- The webpages because it was helpful knowing what we were going to talk about before class. I would keep learning catalytics the same too because it was helpful having multiple choice questions when we are applying the material in class.
- The website and specific learning objectives

Summer 2016

- The website in place of a book was wonderful. Sometimes, when reading a textbook with a lot of material I have a hard time finding what is the most important concepts and try to memorize it all for the tests. The website was in depth enough that I felt well versed in each subject without having way too much info thrown in my face. The videos were also helpful because I am a visual learner and hearing someone say something while also having a visual to look at helped me understand some concepts.
- Keep the website as pre-reading. The website is WAY better than a textbook
- I would definitely keep the lecture videos at the end of the readings because they were very helpful in summarizing each of the concepts presented in the modules.
- The website because it is easy to understand, and also cheaper than a textbook.
- While I think some of the website pages could use a little work I did like how the readings were available on the website and aligned with the lectures. I liked how they were short and to the point as opposed to the textbook and convenient to access.

Fall 2015

- The online resources. Videos and the website were extremely easy to use and helped me understand things very quickly. I would never want to go back to a textbook after this.
- The online blogs are fantastic. I've never actually enjoyed reading about a subject until this class. They seem like they actually help me learn, rather than just being confused by reading a textbook.
I love that there isn’t a required textbook for the course. It was really nice to be able to just read the blog posts that sometimes had really helpful videos instead of getting lost in the jargon of a typical textbook. I feel like this made the class much more relevant to more majors.

The webpages with the video were absolutely awesome. Anytime the reading was unclear the videos with the speaker being Dr. Choi or Hank Green always clarified everything.

I enjoyed the website created by the professors. I feel that resource really made learning much easier and more accessible than a standard textbook.

I think the online text source was a good idea because it meant that I knew exactly where I needed to go to get question answered. It was easy to use and well organized.

3. Quantitative and Qualitative Measures

3a. Overall Measurements

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: 942

- Fall15 N = 265. Poll of 234 students: 92% positive, 4% neutral, 4% negative
- Spr16 = 218. No poll data.
- Sum16 N = 41. Poll of 30 students: 100% positive, 0% neutral, 0% negative
- Fall16 N = 229. Opinion mixed. Materials were presented in an alternative order.
- Spr17 N = 149. No poll data.
- Sum17 N = 40. No poll data.
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:

Reporting conservatively, 8% of students, out of a total 483 students affected, earned a D or F (did not pass) or dropped/withdrew from the course in the fall/spring semesters of implementation. In Summer 2016, 5% of students did not pass, while 17% withdrew. The Fall/Spring DFW results are comparable but slightly lower than the before implementation Fall 2014 rate of 8.3%, and substantially higher in Summer 2015, which has 6.8% DFW. Summer withdrawal rates are highly variable is typical at Tech, reflecting smaller class sizes and students’ attempt to carry a full Fall/Spring (16 week) load during an 11 week semester.

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)

3b. Narrative

We collected student comments and student survey data, and completed a test question comparison from pre- and post-implementation of open-source course materials (attached).
Average GPAs have remained similar pre- and post-implementation: Fall 2014 Reporting conservatively, 8% of students, out of a total 483 students affected, earned a D or F (did not pass) or dropped/withdrew from the course in the fall/spring semesters of implementation. In Summer 2016, 5% of students did not pass, while 17% withdrew. The Fall/Spring DFW results are comparable but slightly lower than the before implementation Fall 2014 rate of 8.3%, and substantially higher in Summer 2015, which has 6.8% DFW. Summer withdrawal rates are highly variable is typical at Tech, reflecting smaller class sizes and students’ attempt to carry a full Fall/Spring (16 week) load during an 11 week semester.

Data file attached for internal use only.

4. Sustainability Plan

We continue to use the website in BIOL 1510 and review and revise content on a per semester basis.

5. Future Plans

The success of this project prompted us to seek funding to create open-source course materials for two subsequent courses: BIOL 1520 Organismal Biology and BIO 1220 The Biology of Sex and Death. We replaced textbooks in both of these courses in Spring 2017.

The results of the BIOL 1510 open-source course materials project were presented at the 2016 Open Education Conference in Richmond, VA and the 2017 SoTL Commons Conference in Savannah, GA. A manuscript on this work is in preparation for submission to a peer-reviewed journal on science education research.

6. Description of Photograph

Screen capture of bio1510.biology.gatech.edu, the open-source course materials site created and curated by Jung Choi, Shana Kerr, and Chrissy Spencer, funded by an ALG grant.