**Affordable Learning Georgia Textbook Transformation Grants**

**Final Report**

**Date:** June 1, 2015

**Grant Number:** Proposal 47 (Round 1 submission)

**Institution Name(s):** Dalton State College

**Team Members (Name, Title, Department, Institutions if different, and email address for each):** Dr. Marina Smitherman, Director of the Center for Academic Excellence and Associate Professor of Biology (msmitherman@daltonstate.edu) and Dr. Chuck Fink, Assistant Professor of Biology (cfink@daltonstate.edu)

Both are in the Department of Natural Sciences at Dalton State College.

**Project Lead:** Dr. Marina Smitherman

**Course Name(s) and Course Numbers:** Human Anatomy & Physiology I (BIOL 2212K) and Human Anatomy & Physiology II (BIOL 2213K)

**Semester Project Began:** Fall 2014

**Semester of Implementation:** Spring 2015

**Average Number of Students Per Course Section:** 24

**Number of Course Sections Affected by Implementation:** 3

**Total Number of Students Affected by Implementation:** 71

**1. List of Resources Used in the Textbook Transformation**

Anatomy and Physiology, OpenStax College, Creative Commons Attribution 3.0 Unported License, https://openstaxcollege.org/textbooks/anatomy-and-physiology

**2. Narrative**

The objective of this project was to switch from a conventionally published textbook (Human Anatomy and Physiology, Marieb and Hoehn) to a free online textbook (published by OpenStax College) for 3 sections of Human Anatomy and Physiology (A&P) taught at Dalton State College. This is a 2-part course (consisting of A&P I, BIOL 2212K, and A&P II, BIOL 2213K) that is primarily taken by students planning on careers in the health professions (such as nursing and respiratory therapy). For this project, Dr. Smitherman taught A&P II and Dr. Fink taught A&P I in the Spring semester of 2015. The motivation to do this was to relieve the financial burden of the students. As one of the lowest cost institutions of higher learning in the United States, Dalton State serves a particularly important role for lower income students in the area. The project would save students upwards of $200 each. However, there were several concerns we had when beginning this project. Would the students be receptive to the change in textbook (switching from a physical book, like they’ve experienced most of their academic careers, to an electronic book)? Would the OpenStax textbook adequately address the key material of the course? And most importantly, would the students’ performance in the course be impacted?

While switching the assigned textbook, we didn’t want to drastically change the material and activities presented in class. The information presented across different anatomy and physiology textbooks tends to be extremely similar. The largest challenge from an instructional perspective was to redo syllabi and study guides to make sure students are reading the appropriate textbook material to supplement classroom activities.

Assessment of the students’ response to the study was done through a series of four surveys (taken at intervals throughout the semester and submitted online through Google Docs). All students enrolled in the classes were offered extra credit for completing the surveys. Of the 71 total students enrolled in both classes, 29 participated in the surveys. These surveys indicated a moderate preference for the existing textbook over the OpenStax, particularly as the semester progressed (an opinion that the instructors generally shared). However, students seemed extremely open to the idea of using an online textbook (for the sake of convenience). While some students prefer to have a hard copy of their textbook, OpenStax College made available a physical copy of the textbook that students could obtain through the bookstore. While this option was not free for students, it would still cost students much less money than the other textbook (the physical OpenStax book costs ~$50).

We were very pleased that classroom performance (as indicated by midterm and final grade distributions) did not seem to be affected when compared with previous semesters. In fact, student performance was slightly higher this semester (particularly in A&P II). Given the primary objective to lower student costs, having student performance remain unchanged was an extremely positive and encouraging result. Most of the students indicated that they would welcome the chance to take similar (Open resource) courses in the future.

This project showed us how practically a change to a free online textbook can be implemented, especially when the book is established and maintained through OpenStax College. Before the announcement of the ALG grants, there was already a great deal of discussion at our school about actions to reduce the cost of course materials for students. This ALG grant was an excellent opportunity to proceed with such a transformation, while collecting data to properly assess the outcome. We would certainly be open to doing similar course redesigns in the future, and encourage other faculty to do similarly.

**3. Quotes**

“I would choose to take another course requiring an E-Book. I would be much more at ease with having an E-Book throughout a course. One thing I have enjoyed in this course is not carrying a book but also having it available anywhere and everywhere I go. I feel no need to slave over a heavy bag full of books when I could just continue to carry my cellphone or laptop to and from class.”

“I would choose a course that required an e-book if I knew it would be significantly cheaper. Otherwise, I almost prefer something tangible that I can mark notes on.”

“You can always have your book with you if you need to study or do any homework. Also, you don't have the weight of a textbook to have to carry around.”

**4. Quantitative and Qualitative Measures**

For this study, measures of impact on student experience were obtained from the results of four surveys that the students completed online (through Google docs). The impact on student success was quantified through midterm and final grade distributions and overall GPA, and the final DFW rate for the section.

In the first survey, several background questions were asked (name, instructor, major/program, GPA). Most of the students taking these classes were either in their first or second year of college. 7/29 students (24%) had taken a course before than used an online book; 4 of those students had used a book through OpenStax College. Students were overwhelmingly supportive of the idea of a free, online book. 90% (26/29) indicated they would be willing to enroll in a future course that used an online book. The two main reasons for favoring a course that used an online book were the lesser expenses and the convenience (of not having to carry around a physical book). Several students did indicate that they preferred having a physical book. We did give all students the option of buying the physical version of the OpenStax textbook through our campus bookstore (for $50, which is still significantly less expensive than the Marieb textbook). Of the 29 students were surveyed, 4 (14%) purchased a physical book, 15 (52%) downloaded a PDF version of the textbook, and 14 (48%) used the Web view version of the textbook. [Percentages total more than 100% since some students used more than one format of the textbook.]

Also in the first survey, students were asked which electronic devices they used. The results were: laptop (69%), kindle (10%), other e-reader (10%), desktop (38%), smartphone (79%), tablet (41%). When asked which social media sites they used the results were: Facebook (86%), Twitter (21%), Instagram (69%), Snapchat (45%), None (3%).

The remainder of the survey questions were related to comparisons of the two textbooks: Marieb and OpenStax. The questions asked students to answer on a 5 point scale: a 1 indicates Marieb is strongly preferred, a 2 indicates Marieb is slightly preferred, a 3 indicates that neither book is preferred over the other, a 4 indicates that OpenStax is slightly preferred, and a 5 indicates that OpenStax is strongly preferred. The numbers from all students were averaged. Therefore, averages below 3.0 indicate a preference for the Marieb book while averages over a 3.0 indicate a preference for the OpenStax book. A scanned PDF version of the Marieb book was made available to all students participating in the survey to do comparisons.

In the first survey, which was administered about a quarter of the way into the semester, students were asked several general comparison questions for the two books. When asked “Overall, rate how the material is organized” the score was 3.41. Results of other questions are as follows: “Overall, how clear is the material written in the text sections?” 3.17; “Overall, how clear are the figures/tables?” 3.24; “Overall, how would you rate the supplemental materials that come with each textbook?” 3.59; “Overall, which book is your preference?” 3.51. The student comments (when asked to explain these preferences) were not particularly enlightening. While the numbers suggest a preference for OpenStax, most of the comments discussed aspects of the Marieb book that they preferred (like the organization, quality of figures and tables, better online supplemental site). Several of the comments that spoke positively for the OpenStax book talked about expense and convenience, so perhaps initially students were not completely understanding that we wanted them to evaluate the textbooks on their own merits (independent of the fact that one was a large physical book that cost a great deal of money).

The remainder of the first survey, and for the entirety of the remaining three surveys, gave students figures and text for specific topics from the two textbooks. Students were asked which was their preference, using the same 5 point scale (as described above). For each of the four surveys, 6-9 comparisons were asked to be made. These were selected to be representative key topics that students needed to learn as part of the course. Effort was made to select topics that were spread evenly throughout the course (for specific information, see the attached supplemental data). The remaining three surveys were given at regular intervals during the semester: the second at the mid-point of the course, the third at the three-quarters point, and the fourth at the end of the course.

For these specific evaluations from the first survey, the scores were as follows: 3.34, 2.66, 2.41, 2.48, 2.86, 2.59, 2.66, 3.00, 3.03. For survey two, these results were: 1.68, 2.13, 2.23, 2.87, 2.87, 2.93, 2.97. For survey three, these results were: 2.32, 2.12, 2.20, 2.24, 2.68, 2.56. For survey four, these results were: 1.96, 2.25, 2.32, 2.46, 2.64, 2.61. Interestingly, while the initial students of the OpenStax textbook were more favorable, when asked to compare specific sections the Marieb book was rated consistently higher. In particular, this began with the second survey, by which point in the course the students had taken the first exam (and were getting a better idea of how well they were doing in the class).

To assess student performance, comparisons for this semester were made with students from previous semesters (who were assigned the Marieb textbook). To better control the data, we limited comparisons to Spring 2013 and Spring 2014. We also only compared students who had the same instructor (either Dr. Smitherman or Dr. Fink) with the same format of class (hybrid and online classes were not compared). The following table shows midterm GPA, final GPA, and DFW rate for the entire class:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Midterm GPA | Final GPA | DFW rate |
| A&P I, Spr 2013 | 1.67 | 2.21 | 0.35 |
| A&P I, Spr 2014 | 2.21 | 2.02 | 0.42 |
| A&P I, Spr 2015 | 1.74 | 2.29 | 0.37 |
| A&P II, Spr 2013 | 2.38 | 2.6 | 0.22 |
| A&P II, Spr 2014 | 2.41 | 2.82 | 0.19 |
| A&P II, Spr 2015 | 2.6 | 3.17 | 0.08 |

Student performance in both classes while doing this affordable learning transition is consistent with past semesters. In fact, for both courses the final GPA was higher than any of the previous two years.

In the uploaded file, all data and analysis are presented in a series of tabs within an Excel file. Data is organized by surveys, with the final tabs for the classroom performance. Links to the Google Docs pages for each survey are provided within the corresponding Excel tab.

**5. Sustainability Plan**

As long as the OpenStax textbook for Anatomy and Physiology remains freely available to students, it will continue to be offered to our students as a low-cost textbook option. Over the next few years, OpenStax College has plans to increase their offerings in numerous disciplines. So the prognosis of this approach sustaining into the future is outstanding.

**6. Future Plans**

This project has shown us that a no-cost textbook alternative can be applied to Anatomy and Physiology with no drop in student performance and minimal changes to how the course is taught. An immediate follow-up would be for us to continue to use the OpenStax book for all of our sections of A&P and to encourage other faculty teaching this course to do the same.

A more ambitious future plan would be to adapt the laboratory manual (which currently costs students up to $110) to an Open Resource version as well. A similar initiative is currently being undertaken in our department for our Principles of Biology courses (BIOL 1107K and 1108K). Since the labs for A&P need to be somewhat standardized (to facilitate set-up), changing the lab manual would require the approval and support of all faculty teaching A&P. However, since the support for extremely high for the Principles of Biology redesign, I see little reason to expect a lack of support for a similar redesign for A&P. This could be the topic of another ALG proposal for Rounds 4 or 5.

We would like to present our experiences and findings of this project at teaching conferences. The topic of course redesign to low/no cost alternatives seems to be a growing one, and has been the topic of resent workshops and presentations at recent conferences. Considering the number of Dalton State College faculty who have been participating in the ALG grants, this would seem to be an excellent topic for a session at the next Dalton State Teaching and Learning Conference (if not an earlier workshop organized through the Center for Academic Excellence).

**7. Description of Photograph**

(left-right) Dr. Chuck Fink, instructor of record; Dr. Marina Smitherman, team lead and instructor of record.