

1. PROJECT GOALS

- *Adopt the OpenStax non-majors biology textbook Concepts of Biology as part of the non-majors biology science core curriculum courses at VSU.*
- *Develop the necessary course tools to engage students based on the newly adopted resources.*
- *Support the long term use and sustainability of open educational resources in non-majors science curriculum.*
- *Assess student success and perceived engagement with the open educational resources.*

1.1 STATEMENT OF PROBLEM

Within the Valdosta State University Core Curriculum, students are required to take at least 8 credit hours of science courses. Non-science majors enrolled in required core science courses may be less likely to purchase course textbooks because of lack of perceived relevance to their degree plans. A recent survey of over 2,000 college students finds that the cost of textbooks deters students from purchasing required resources, even as students express concern of missed content and the associated grade implications (Senack 2014).

Course materials are selected to provide students necessary resources to achieve the learning outcomes specified by the instructor. Any barrier to obtaining these resources therefore limits the student's ability to meet the learning outcomes of the course, to successfully complete the course, and complete their degree program. With the recent shift in funding of state sponsored colleges and universities based on student retention and completion, barriers to student learning are likely to impact not just the student, but the academic community as well.

The recent rise of quality, peer-reviewed open education resources, such as OpenStax textbooks, provides resources that meet the learning outcomes of core college level courses. These resources are freely available in a digital format, thus removing the financial barrier to student access and potentially increasing the number of students engaging with course materials. In addition, these resources are available in print format at dramatically reduced cost relative to texts from large publishing companies.

By removing the financial barrier to course materials, we hope to increase student engagement in their coursework, which should increase their success in both this course and their academic career. At VSU, BIOL 1010 and BIOL 1030 fulfill the core curriculum science requirements, with a combined annual enrollment of at least 900 students in sections taught by the PIs. This is a population of students that are not likely to purchase course textbooks, and therefore the effect of an intervention such as this may have large impacts on academic success.

While OER textbooks provide a free resource for students, developing a course around a new text requires restructuring of learning goals, creating learning activities, and refining assessment tools to maximize student engagement with the new text. This grant will support the development of these tools.

1.2 TRANSFORMATION ACTION PLAN

The PIs have selected the OpenStax book Concepts of Biology for use in both BIOL 1010 and BIOL 1030 and are piloting the text in both courses in Fall 2014. Previously, both courses had been taught by the PIs for at least 3 years using Hoeffnaegels' Biology Concepts and Investigations. The PIs are also currently set to teach both courses in the Spring 2015.

With support from the present grant we are looking to evaluate our initial implementation of the new textbook and revise our instruction based on feedback and peer evaluation. Specifically, we are looking to:

- develop pre-class assignments that engage students with reading,
- develop in-class activities centered on new readings, and
- develop and revise formative assessment tools that are aligned with new learning objectives of the new text.

The PIs will work together through a peer review process to align revised assessment tools with learning objectives and evaluate implementation of class activities. The PIs bring a combined total of 21 years of teaching non-majors biology. In addition to first-hand experience, the PIs have participated in professional development activities focused on creating learner-centered classrooms and implementing strategies that have been demonstrated to increase student success in science courses (Freeman *et al.* 2014).

Assessment

Since the PIs have been teaching these courses for several years, we will be able to compare DFW rates while controlling for any instructor effect. We will compare DFW rates from the two semesters prior to the new text adoption and two semesters with the new text, grouped by instructor. If access to a free text results in increased adoption by students and increased use results in greater learning gains, we would expect to see a decrease in DFW rates with the new text.

In addition, as part of VSU's Core Curriculum, the PIs worked with colleagues to develop and implement a standardized course assessment tool which has been used since Spring 2013. We will use the same assessment tool in each of the revised courses and compare the percentage of students that exceed, meet and fail to meet expectations. Again, we predict that there will be more students meeting or exceeding expectation if the freely available resource results in higher use and thus greater learning.

Finally, we will also assess students' perception of value of the new resource through surveys given at midterm and end of semester in the Spring 2015.

1.3 TIMELINE

- Oct-14
 - Begin to develop/revise pre-class and formative assessment tools
- Nov-14
 - PIs meet to review and discuss tools and identify additional concerns prior to Spring 2015.
- Dec-14
 - Implement assessment tool with 1st semester new textbook sections
 - Consolidate data from previous semesters for future analysis
- Jan-15
 - PIs meet to discuss any last minute concerns, issues and ideas
- Mar-15
 - PIs meet to discuss status of implementation of new textbook
 - Peer evaluation of class activities and/or new assessment tools
 - Implement 1st student survey of new textbook
- May-15
 - Implement core assessment tool with 2nd semester of new textbook sections
 - PIs meet to discuss success and future barriers based on new textbook
 - Consolidate Spring 2015 data with previous semester data and perform analyses
 - Provide final project report

1.4 BUDGET

Personnel

- Salary support for each PI \$3,333.00 \$9,999.00

Travel

- Travel for PIs to Planning and Organizational Meeting \$800.00

1.5 SUSTAINABILITY PLAN

Both Drs. Croteau and Waters are the primary instructors for BIOL 1030 at VSU and Dr. Henkel is one of two faculty that currently teaches BIOL 1010. All PIs are currently committed to teaching these courses and will use resources which best meets their learning objectives. The present proposal will provide the PIs with necessary resources to revise these courses. Provided there is at least no difference in student success between the old text and the new OpenStax textbook, the instructors will continue to use the tools developed through this proposal.

In addition, the PIs will make their course tools, including all assignments, in-class activities, and formative assessments available to any instructor of record for these courses or interested faculty.

1.6 REFERENCES & ATTACHMENTS

- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410–8415.
- Senack, E. (2014). Fixing the broken textbook market: How students respond to high textbook costs and demand alternatives. Retrieved August 22, 2014 from <http://www.uspirg.org/reports/usp/fixing-broken-textbook-market>

PROPOSAL SUBMISSION: ALL PROPOSAL DOCUMENTS, REFERENCES, and ATTACHMENTS SHOULD BE SUBMITTED IN A SINGLE EMAIL TO alg@gatech.edu by 5:00 PM, EST, September 8, 2014.



Affordable Learning Georgia
Textbook Transformation Grants

August 28, 2014

Letter of support for proposal submitted by Timothy Henkel, Emily Croteau and Matthew Waters

Dear Committee:

I am writing this letter to offer my full support for this proposal to use an OpenStax textbook in the introductory biology courses BIOL 1010 and BIOL 1030. These courses serve a large number of students at VSU that allow the students to meet the science requirements of the USG core curriculum. Drs. Henkel and Croteau have substantial experience and training in pedagogical strategies associated with teaching science, and Dr. Waters has proven to be an extremely effective teacher in these large-size lecture courses based upon the outstanding teaching evaluations submitted by his students. This, therefore, is a very effective team to undertake this project. It is fair to say that many, if not most, of the students are enrolled in these courses only because they are required to do so, and unfortunately many will not buy the textbooks in an attempt to just get by. That strategy rarely works and therefore this proposal to evaluate a free OpenStax text is expected to significantly improve student success and learning in these courses.

BIOL 1010 and BIOL 1030 are taught every semester and this will continue so long as the current USG core curriculum is in place. There is every confidence that this project will prove to be both successful and easily sustainable for years to come. In addition, this proposal nicely complements a separate undertaking by the Department of Biology to offer the manuals accompanying the co-requisite laboratory courses at a greatly reduced cost to the student beginning in fall 2014.

Thank you for your consideration of this worthy proposal.

Sincerely,

Robert L. Gannon, PhD
Professor and Head of Biology

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