Summer 2017

Anatomy and Physiology I & II Labs (UGA)

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Grants Collection
University of Georgia

UNIVERSITY SYSTEM OF GEORGIA

DeLoris Hesse, Deanna Cozart, Brett Szymik, Rob Nichols

Anatomy and Physiology I & II Labs

Affordable Learning Georgia

Georgia's Virtual Library GALILEO
An Initiative of the University System of Georgia

Grants Collection

Affordable Learning Georgia Grants Collections are intended to provide faculty with the frameworks to quickly implement or revise the same materials as a Textbook Transformation Grants team, along with the aims and lessons learned from project teams during the implementation process.

Each collection contains the following materials:

- Linked Syllabus
  - The syllabus should provide the framework for both direct implementation of the grant team's selected and created materials and the adaptation/transformation of these materials.
- Initial Proposal
  - The initial proposal describes the grant project's aims in detail.
- Final Report
  - The final report describes the outcomes of the project and any lessons learned.

Initial Proposal

Application Details

Manage Application: ALG Textbook Transformation Grant

Award Cycle:	Round 4
Internal Submission Deadline:	Monday, September 7, 2015

Application Title:	174
Submitter First Name:	Deanna
Submitter Last Name:	Cozart
Submitter Title:	Coordinator of Open Education Resources
Submitter Email Address:	dcozart@uga.edu
Submitter Phone Number:	706-542-2160
Submitter Campus Role:	Proposal Investigator (Primary or additional)
Applicant First Name:	Deanna
Applicant Last Name:	Cozart
Co-Applicant Name(s):	DeLoris Wentzel Hesse, C. Edward Watson
Applicant Email Address:	dcozart@uga.edu
Applicant Phone Number:	706-542-2160
Primary Appointment Title:	Coordinator of Open Education Resources
Institution Name(s):	The University of Georgia

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

Dr. Deanna L. Cozart – Coordinator of Open Education Resources, Center for Teaching and Learning, The University of Georgia. dcozart@uga.edu
Dr. DeLoris Wenzel Hesse – Associate Professor, Department of Cellular Biology, The University of Georgia. hesse@uga.edu
Dr. Brett G. Szymik – Assistant Professor, Department of Cell Biology and Anatomy, Georgia Regents University/The University of Georgia partnership. szymik@uga.edu
Dr. Rob Nichols – Lecturer, Department of Cellular Biology. The University of Georgia. Rob10367@uga.edu
Dr. Leslie Pryor – Temporary Lecturer, Department of Cellular Biology, The University of Georgia. Leslie00@uga.edu

Dr. C. Edward Watson, Director, Center for Teaching and Learning, The University of Georgia. edwatson@uga.edu

Sponsor, (Name, Title, Department, Institution):

Dr. C. Edward Watson, Director, Center for Teaching and Learning, The University of Georgia.

Proposal Title: 174

Course Names, Course Numbers and Semesters Offered:

Anatomy and Physiology I (CBIO 2200) and Anatomy and Physiology I Laboratory (CBIO 2200L)
Anatomy and Physiology II (CBIO 2210) and Anatomy and Physiology II Laboratory (CBIO 2210L)

These are all offered every semester, including fall, spring, and summer.

Final Semester of Instruction:	Fall 2016
Average Number of Students per Course Section:	CBIO 2200 (L) = 891; CBIO 2210 (L) = 712
Number of Course Sections Affected by Implementation in Academic Year:	All course sections
Total Number of Students Affected by Implementation in Academic Year:	1,603
List the original course materials for students (including title, whether optional or required, & cost for each item):	Lecture: Saladin, K. (2014). Anatomy & physiology: The unity of form and function (7th ed.). New York, N.Y.: McGraw-Hill. $292.25 Lab: Wise, E. (2014). Anatomy & physiology laboratory manual (7th ed.). Boston: McGraw -Hill Higher Education. $162 *Note: The same texts are used for both courses in the sequence.
Proposal Categories:	OpenStax Textbooks
Requested Amount of Funding:	$30,000.00
Original per Student Cost:	$454.25
Post-Proposal Projected Student Cost:	$0.00

Projected Per Student Savings: $454.25

Plan for Hosting Materials: OpenStax CNX

Project Goals:

1. Transition Anatomy and Physiology I and II lecture and lab students away from current expensive materials and to the OpenStax text for Anatomy and Physiology.

2. Create a lab manual to pair with the OpenStax text to replace the current separate lab text.

3. Provide significant cost savings to a large number of UGA students

4. Contribute to the growing initiative of making college more affordable for all students.

5. Evaluate the experiences of students and faculty through this process.

Statement of Transformation:

This proposal is specifically aimed at significantly reducing the textbook costs for students enrolled in Anatomy and Physiology I and II at The University of Georgia, as the rising costs in higher education and specifically those associated with the costs of textbooks have been well documented (CBS MoneyWatch, 2012; College Board, 2013; Schick & Marklein, 2013).

One way to combat these increasing costs is through the use of Open Educational Resources (OERs), which are texts or materials that are located in the public domain or written with open copyright licenses (Kortemeyer, 2013). This proposal specifically targets all sections of Anatomy and Physiology I with lab and Anatomy and Physiology II with lab, which currently have course materials that cost students $454.25, to transition to OER materials reducing that cost to $0.00 and saving UGA students over $400,000.00 in textbook costs each year.

Currently, students in many majors, including nursing, pharmacy, occupational therapy, physical therapy, sports medicine, and more are required to complete the sequence of both courses, as well as the accompanying labs. Dr. DeLoris Wenzel Hesse is an Associate Professor of Anatomy and Embryology and works to coordinate all of the undergraduate sections of the course. She will serve as a content expert, as will Dr. Brett Szymik, an Assistant Professor through the Georgia Regents University/University of Georgia partnership. In addition, faculty members Dr. Rob Nichols and Dr. Leslie Pryor will contribute to creation and teach students with the developed materials. This team represents the entire Anatomy and Physiology undergraduate program members, and would transform the experience of students across many pre-medicine majors by significantly reducing the textbook costs associated with their program of study by utilizing an open textbook and creating an accompanying open lab text.

References:

CBS MoneyWatch (2012, September 21). Why college tuition keeps rising. Retrieved from http://www.cbsnews.com/8301-505145_162-57517032/why-college-tuition-keepsrising/

The College Board. (2013). *Trends in college pricing 2013*. Washington, DC: Author.

Kortemeyer, G. (2013). Ten years later: Why open educational resources have not noticeably affected higher education, and why we should care. Educause Review, 48(2). Retrieved from http://www.educause.edu/ero/article/ten-years-later-why-open-educationalresources-have-not-noticeably-affected-higher-education-and-why-we-should-ca

Shick, D., & Marklein, M.B. (2013, August 20). College students say no to textbooks. *USA Today.*

Transformation Action Plan:

There are two aspects to this transformation at scale project. First of all, there is the implementation and use of the OpenStax Anatomy and Physiology text at no cost in all sections of CBIO 2200 and CBIO 2210. This text has already been identified as meeting the needs of the instructors for implementation of the project. CTL staff will work with all faculty on any subsequent course redesign projects that appear in order to fully integrate this text into the current course structure.

The second aspect of this project is the creation of a lab manual to accompany the OpenStax text for Anatomy and Physiology. The lab is a required component of these courses, and the text alone for that portion of the class is $162.00. Drs. DeLoris Wentzel Hesse and Brett Szymik will serve as subject matter experts in the creation of a new open lab manual for the course, while Drs. Rob Nichols and Leslie Pryor will serve as both subject matter experts and instructors of record during implementation. Dr. Deanna Cozart will help to assure the project is meeting guidelines, manage the budget, complete reports, and facilitate the evaluation of the materials, while Dr. C. Edward Watson will offer additional CTL support as needed. The newly created lab manual will be shared with OpenStax and hosted on the OpenStax CNX platform.

Quantitative & Qualitative Measures:	Throughout the project, the CTL at UGA will work alongside the Anatomy and Physiology faculty to evaluate the success of the project using both quantitative and qualitative measures. In terms of quantitative measures, the withdrawal and failure rate will be calculated, as well as descriptive data for total cost savings based on enrollment during the implementation period. Additionally, students will be surveyed about their perceptions of the new materials and thoughts about using the OpenStax and newly developed content. In terms of qualitative data, the survey for students will include open-ended questions about their experiences that will be coded for themes. We will also conduct interviews and focus groups with students about their perceived quality and experiences, and analyze that feedback with the responses from the survey.

Timeline:

September 2015 – Submit transformation proposal

October 2015 – Receive award notification

Spring 2016 – Content evaluation of the OpenStax text begins; Beginning of development of accompanying lab text and writing/development

Summer 2016 – Completion of materials creation

Fall 2016 – Implementation of materials in all course and lab sections of CBIO 2200 and CBIO 2210.

Fall 2016 – CTL works with CBIO faculty to collect data on student experiences and satisfaction

January 2017 – Submit final report of findings to ALG

Budget:

Faculty Department Stipend (Spring/Summer 2016):

Dr. DeLoris Wenzel Hesse - $5,000.00

Dr. Brett Szymik - $5,000.00

Dr. Rob Nichols - $5,000.00

Dr. Leslie Pryor - $5,000.00

Center for Teaching and Learning Support (Fall 2016):

Dr. Deanna Cozart - $5,000.00

Dr. C. Edward Watson - $4,200.00

Travel Expenses:

Grant kickoff meeting and other travel as necessary - $800.00

Total Project Expenses: $30,000.00

Sustainability Plan:

Drs. Hesse, Szymik, Nichols, and Pryor plan to continue using the OpenStax text and accompanying lab text into the future. CBIO 2200(L) and CBIO 2210(L) are both taught every semester, including summer, and will be for the foreseeable future. The newly created lab text will be hosted with OpenStax CNX and available to distribution to other interested institutions. The CTL will continue to provide assistance and collaborative support of the materials as needed.

The University of Georgia

Center for Teaching and Learning

September 4, 2015

Review Committee
ALG Textbook Transformation Grants
University System of Georgia

Dear Review Committee Members,

I am excited and pleased to have the opportunity to write in support of the UGA Center for Teaching and Learning's (CTL) grant proposal that is in response to the recent request for proposals for USG Textbook Transformation Grants. This proposal provides an opportunity for the CTL to extend the OER course transformation practices we have developed over the past two years into another large enrollment course that promises exceptional cost savings for students.

While the adoption of a textbook is ultimately the decision of an individual faculty member, and that decision may change as new opportunities arise, we feel this particular project has a high probability for sustainability and success. Our faculty partners in this project are Dr. DeLoris Wenzel Hesse and Dr. Brett Szymik from the Department of Cellular Biology. Both faculty members participate in the Georgia Regents University(GRU)/University of Georgia (UGA) Medical Partnership, and coordinate the undergraduate Anatomy and Physiology program of study for all pre-medicine majors.

As coordinator for Anatomy and Physiology, Dr. Hesse makes departmental teaching assignments, can influence textbook decisions, and ensure uniformity across sections of the same course taught by several instructors. This proposal is specifically targeting widespread implementation across the course sequence of Anatomy and Physiology I and II, including corresponding laboratory courses. Given this broad implementation, there a substantial opportunity to impact many students and offer significant cost savings to pre-medicine students.

While the attached proposal provides a range of expected cost savings, given Dr. Hesse's role in assuring adoption and sustainability, we fully expect the actual savings to approach the top figures we have shared as the GRU/UGA partnership continues to expand in the future. Thank you for considering our proposal.

Sincerely,

C. Edward Watson, Ph.D.
Director

Instructional Plaza • Athens, Georgia 30602-3016 • Telephone (706) 542-1355 • Fax (706) 542-6587

Syllabus

CBIO UGA Grant Team 174 Materials and Outline for Use:

All labs are now available in GALILEO Open Learning Materials: http://oer.galileo.usg.edu/

Anatomy and Physiology I labs: http://oer.galileo.usg.edu/biology-textbooks/13/

Anatomy and Physiology II labs: http://oer.galileo.usg.edu/biology-textbooks/14/

The original files are hosted on the CBIO OS Google Drive Folder:

https://drive.google.com/drive/folders/0B_tZM-eFLdFLbk9UNlQtVUI4Szg?usp=sharing

Final Report

Affordable Learning Georgia Textbook Transformation Grants

Final Report

Date: 12/23/16

Grant Number: 174

Institution Name(s): The University of Georgia

Team Members: Deanna L. Cozart – Coordinator of Open Education Resources, Center for Teaching and Learning, The University of Georgia. dcozart@uga.edu

DeLoris Wenzel Hesse – Associate Professor, Department of Cellular Biology, The University of Georgia. hesse@uga.edu

Brett G. Szymik – Assistant Professor, Department of Cell Biology and Anatomy, Georgia Regents University/The University of Georgia partnership. szymik@uga.edu

Rob Nichols – Lecturer, Department of Cellular Biology. The University of Georgia. Rob10367@uga.edu

Project Lead: DeLoris Hesse

Course Name(s) and Course Numbers: Anatomy and Physiology I and II Labs – CBIO 2200L & CBIO 2210L

Semester Project Began: Spring 2016

Semester(s) of Implementation: Fall 2016

Average Number of Students Per Course Section: CBIO2200/L = 891 students per year

CBIO2210/L = 712

Number of Course Sections Affected by Implementation: All lab sections

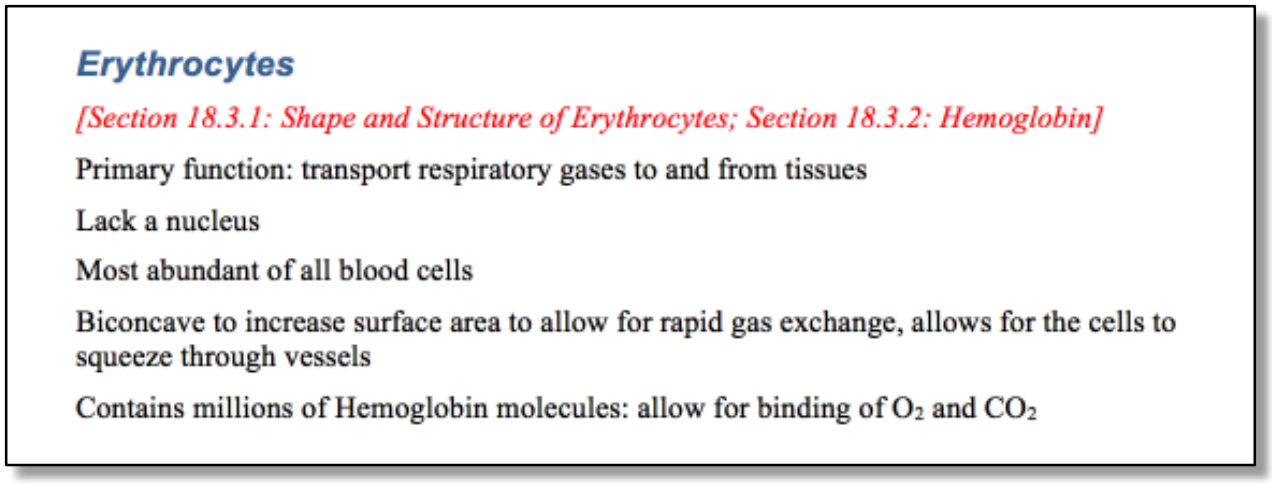
Total Number of Students Affected by Implementation: 1,603

1. Narrative

We began the transformation project having already adopted the Open Stax Anatomy & Physiology textbook for our lectures. During the 3 semesters prior to the pilot semester, we had been phasing in the textbook by first listing it as an alternate textbook in the spring and summer semesters of 2015, then as the required text in the fall semester of 2015. It was in the fall of 2015 when we first sat down to plan the transformation of our lab materials into an open source A&P lab manual built on the Open Stax text and hosted on the Open Stax CNX. Ideally, this would allow students to link to the lab modules, but also make the materials available to anyone wishing to use and modify them to fit their needs.

Our team started with existing materials that had been developed by some of the previous instructors and lead-TAs. These materials were in the form of PowerPoint slide sets that consisted primarily of figures from our previous textbooks, bullet-point lists of structures to identify, and some description of processes where appropriate (e.g., cardiac cycle, how to take blood pressure, etc.). We converted these existing documents into a word processor format, added the appropriate student outcomes (learning objectives), and began the process of writing additional content, linking it to specific sections and figures in the Open Stax textbook. The idea was that, rather than writing large amounts of content that had already been written in the textbook, we refer students directly to a section or figure in the text that they should read, study, and reference when preparing for the lab and the practicals. The only original material in the lab manual would be any procedures and objectives that are unique to a given lab.

This was one point at which we experienced one of our early challenges with the project. The Open Stax text is available in 4 different formats, only two of which have consistent page numbers, namely the hardcopy and the PDF version. There is an iBooks version available only for Apple products, but the pagination of this version is not consistent with the hardcopy/PDF. Further, the web-based version does not have page numbers at all. Though we have not done a formal survey of Open Stax usage in our classes, informal polls indicate most students use the web-based version in both of our courses. Additionally, in our design, the hyperlinks in our lab manual would link the reader to this web-based version of the Open Stax text. This was primarily an unexpected challenge for the transformation team, particularly between those of us writing the materials (the instructors of record for the two A&P courses), and the members of the team who were helping us create the links in the documents and publish the materials to CNX. Initially, to work around this, we would type the heading into our documents, but many of the headings in the text are quite long. To solve this problem, we created an indexing system in the text for chapter numbers, major headings, minor headings, and had to be sure that we were referring to the same figures in our documents (figures are not numbered consistently across all versions). So, we would have a document that looks like the sample below.



Section headings are followed by textbook sections and figures in red with brackets, and relevant points and themes for the students listed below. The team members working on the CNX upload for us replaced the red text with a hyperlink that takes the students directly to the referenced section and/or figure in the web-based version of the Open Stax textbook. Though it seems like a simple solution, it greatly streamlined our workflow during the spring of 2016 as we prepared to pilot the lab manual in the summer semester.

The transformative impacts on instruction have centered around the unique opportunity to carefully reevaluate our curriculum, combing through every learning outcome across a two-semester sequence, to find overlaps and gaps in content. This has turned out to be an ongoing process that this transformation project has inspired. At the University of Georgia, we aspire to offer a world-class lab experience and curriculum for our students, and that means we are always looking for ways to improve both.

2. Quotes

"I prefer hard copy, but I am willing to use online if it means saving a couple hundred dollars!"

"I prefer having a hard copy of the text, but having it online didn't make it less effective. I do like how it's free and everyone is able to access it. Lab manuals are very expensive and most of the time all you use it for is to read the procedure. It is equally as effective to just post it online."

"Having a free digital lab manual made my life as a college student much easier. I didn't have to fight the crowds at the bookstore or wait for a book to come back in stock if sold out. I really like having an electronic lab manual because it is both eco-friendly and easily accessed."

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: 1,603 over the 2016-2017 school year

- Positive: 30.31% (137 students) of 455 number of respondents
- Neutral: 56.86% (257 students) of 455 number of respondents
- Negative: 12.83 % (58 students) of 455 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: (Unknown at this time – grades will be analyzed once available – see narrative below.)

- ___ 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: (Unknown at this time – see narrative below).

_____% of students, out of a total _____ 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. Narrative

This project was specifically unique in that it supported the creation of an open-source lab manual for exclusive use with the labs for Anatomy and Physiology I and II. The regular A&P lecture courses have been using the OpenStax A&P book for a little over one year; however, prior to this project, students were required to purchase a $162.00 lab manual to accompany the OpenStax text.

Pilot Study – Summer 2016

The lab manual was piloted in Summer 2016 with A&P students, where they were asked to complete a pre- and post-survey about their impressions of open and online learning materials. There were 72 students enrolled in the CBIO 2200 lab and 65 students enrolled in the CBIO 2210 lab. Student participation rates in both surveys were:

(1) Initial survey: second week of semester (2200 N = 58; 2210 N = 59)

(2) Secondary survey: last week of semester (2200 N = 54; 2210 N = 51)

Some of the more interesting results from the pilot the number of students who initially preferred a hard copy of the text, but were more open to an online option after utilizing the open materials during the course.

Q30 - What is your preferred reading method for textbooks?

	Initial		Final	
Answer	%	Count	%	Count
Electronically (i.e. computer, tablet, eReader, phone)	21.37%	25	26.67%	28
Printed hard copy	57.26%	67	39.05%	41
No preference	21.37%	25	34.29%	36
Total	100%	117	100%	105

There was also a change in the number of students who believed online materials were of better quality than a traditional text. While not a statistically significant difference, it is certainly of practical significance that students had more favorable impressions of online learning materials after experience using them.

Initial

Q33 - How do you think the quality of a FREE DIGITAL TEXTBOOK compares to a traditional printed textbook?

Answer	%	Count
WORSE than the quality of a traditional printed textbook	2.56%	3
About the SAME AS the quality of a traditional printed textbook	59.83%	70
BETTER than the quality of a traditional printed textbook	37.61%	44
Total	100%	117

Final

Q31 - How would you rate the quality of the free, online lab manual compared to other lab manuals you have used?

Answer	%	Count
WORSE than the quality of the lab manuals in my other courses	6.67%	7
About the SAME AS the quality of the lab manuals in my other courses	46.67%	49
BETTER than the quality of the lab manuals in my other courses	46.67%	49
Total	100%	105

Students were also more willing to consider enrolling in a future course that utilized online learning materials after having used them in the lab over the summer.

Q34 - Imagine a future course you are required to complete. If the same instructor offers two different sections of the course during equally desirable time slots, but one section uses free digital textbooks and the other uses traditional published textbooks, which section would you prefer to enroll in?

	Initial		Final	
Answer	%	Count	%	Count
I would enroll in the section that uses a TRADITIONAL PRINTED TEXTBOOK	8.55%	10	3.81%	4
I would enroll in the section that uses a FREE DIGITAL TEXTBOOK	77.78%	91	77.14%	81
I would have no preference	13.68%	16	19.05%	20
Total	100%	117	100%	105

Implementation – Fall 2016

Pre- and post-surveys were also utilized with Fall 2016 students. These results are currently being analyzed, however, preliminary results indicate similar student views to the pilot in Summer 2016.

Grade and withdrawal/failure data is significantly more challenging to compile than the student survey. Because the lab is a co-requisite with the Anatomy and Physiology lecture (CBIO 2200 and CBIO 2210), students may not withdraw from the lab independent from the lecture. Additionally, students who withdraw from the lecture are automatically withdrawn from the lab. Thus, we can provide withdrawal data from the lecture courses, but not for the labs independently. We have requested the overall course withdrawal data from UGA, but have not received it now.

Grade data also offers a challenge; students receive a grade for the lab performance, however, it is not an official course grade, but rather a component of their overall lecture grade that is officially reported to UGA. We are working with individual lab instructors to compile the grade data for that portion of the class, though the historical data will be more challenging to ascertain, as it is not centrally reported. Anecdotal evidence suggests students performed at similar levels with the open lab manual as with the traditionally published one in the past.

4. Sustainability Plan

The project team will promote the use of these OER course materials (lab and lecture texts) as required texts for our Anatomy and Physiology courses for the foreseeable future. We plan to continually update and edit these course materials as necessary.

5. Future Plans

This project has served to increase the project team's awareness of available OERs and their use in large enrollment courses. One project member (Hesse) discovered freely-available textbooks for use in her Medical Gross Anatomy and Medical Embryology courses taught in the AU/UGA Medical Partnership, and thus has been able to reduce textbook costs to these medical students.

The data collected as part of this grant have already been presented at the 13th Annual Open Education Conference ((http://sched.co/7lo3) and have been submitted to the 2017 University System of Georgia Teaching and Learning Conference. The final results of this project will be submitted to a peer-reviewed journal by June 2017.

In addition to presentations and papers, this project has inspired the team to produce an open access manual for laboratory instructors. We are currently discussing this project with OpenStax.

6. Description of Photograph

Rob Nichols of the project team with his CBIO students who utilized the open lab manual.