

Fall 2016

Principles of Biology II (Valdosta State University)

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Grants Collection

Valdosta State University



UNIVERSITY SYSTEM
OF GEORGIA

Joshua Reece, Gretchen Bielmyer, John Elder, Theresa Grove

Principles of Biology II





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.



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Initial Proposal

Application Details

Manage Application: ALG Textbook Transformation Grant

Award Cycle: Round 4

Internal Submission Deadline: Monday, September 7, 2015

Application Title: 165

Submitter First Name: Joshua

Submitter Last Name: Reece

Submitter Title: Assistant Professor of Biology

Submitter Email Address: jreece@valdosta.edu

Submitter Phone Number: 229-219-3293

Submitter Campus Role: Proposal Investigator (Primary or additional)

Applicant First Name: Joshua

Applicant Last Name: Reece

Co-Applicant Name(s): Theresa Grove, John Elder, Gretchen Bielmyer

Applicant Email Address: jreece@valdosta.edu

Applicant Phone Number: 229-219-3293

Primary Appointment Title: Assistant Professor of Biology

Institution Name(s): Valdosta State University

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

Joshua Reece, Assistant Professor, Biology, Valdosta State University jreece@valdosta.edu

Theresa Grove, Associate Professor, Biology, Valdosta State University, tjgrove@valdosta.edu

John Elder, Professor, Biology, Valdosta State University jfelder@valdosta.edu

Gretchen Bielmyer, Associate Professor, Biology, Valdosta State University gkbielmyer@valdosta.edu

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

Robert Gannon, Department Chair, Biology, Valdosta State University

Proposal Title: 165

Course Names, Course Numbers and Semesters Offered:

Principles of Biology II; BIOL 1108 offered Fall, Spring, and Summer

Final Semester of Instruction: Fall 2016

Average Number of Students per Course Section: 25

Number of Course Sections Affected by Implementation in Academic Year: 12

Total Number of Students Affected by Implementation in Academic Year: 300

List the original course materials for students (including title, whether optional or required, & cost for each item): Life: The Science of Biology 10th Edition, required, \$175

Proposal Categories: OpenStax Textbooks

Requested Amount of Funding: 24,800

Original per Student Cost: 175

Post-Proposal Projected Student Cost: 0

Projected Per Student Savings: 52,500

Plan for Hosting Materials: OpenStax CNX

Project Goals:

- 1. Replace existing for-profit textbook with free, OpenStax majors biology textbook (Biology, Avissar et al. 2014) in BIOL 1108.**
- 2. Develop learning outcomes (Kennedy et al. 2007) and lecture guides that complement OpenStax textbook and align with existing BIOL 1108 course goals.**
- 3. Develop formative and summative assessments that complement OpenStax textbook and align with existing BIOL 1108 course goals.**
- 4. Integrate OpenStax textbook material with BIOL 1108 laboratory exercises to ensure**

that material complements lab exercises.

5. Identify at least two primary literature articles that cover topics central to the course and can be used as case studies integrated with lectures.

6. Curate OpenStax text, lecture guides, assessment tools, online learning tools, and primary literature with the OpenStax CNX database.

7. Assess student a) performance, b) engagement, and c) perception of the course relative to sections taught with for-profit texts to ensure neutral or positive impacts on student success.

Statement of Transformation:

Principles of Biology II (BIOL 1108) is a large enrollment course at Valdosta State University (VSU) and a required course for many Science, Technology, Engineering and Mathematics (STEM) majors. Like many introductory STEM courses, BIOL 1108 experiences a relatively high DFW rate, on average 33% (2011-2015). The prerequisite to this course at VSU, BIOL 1107, has already been transformed to the OpenStax Biology textbook, and our transformation for this proposal is to replace existing course materials for BIOL 1108 with a free OpenStax Biology textbook and supplements from primary literature. Our stakeholders are the approximately 300 students who take this course every year, and the faculty who teach it. Currently, 94% of students agree that the cost of textbooks and course materials affect their ability to afford college (Textbook Survey Report 2012). Textbook costs reached \$1200 on average during the 2013-2014 academic year (College Board 2013). Our analysis of the current BIOL 1108 text and the OpenStax materials confirms that their coverage of material and concepts is virtually identical (as found in Kingsbury and Galloway 2006). The impact of this transformation on stakeholders and course success will be to save students money and to engage them with primary literature, which has been shown to improve student performance by making the material relevant (Gillen et al. 2004). The transformative impact of this proposal will be to make this large enrollment introductory course more affordable (saving students over \$50,000 per year!), standardized, applicable, and interesting. We also hope that our innovations will lower the DFW rate for this course and improve student motivation to learn biology.

Transformation Action Plan:

We will describe our transformational action plan relative to our six goals. Given the high cost of textbooks and the burden these costs place on students, our first goal is to transition the course to a free text. We have already identified a widely used and validated OpenStax textbook, Biology (Avisar et al. 2014) for the prerequisite for this course (BIOL 1107); at VSU the first four units of OpenStax Biology are used for BIOL 1107K, and we have identified 3 of the remaining units for BIOL 1108. This book was chosen because OpenStax, initiated by Rice University, is one of the premier open textbook systems available, currently used at over 500 institutions across the US (OpenStax College 2014). All of the PIs have taught BIOL 1108 at VSU or the equivalent course at another institution. Jointly, the PIs have over 40 years of experience teaching

Introductory Biology at VSU, and all sections of the course will be taught by a subset of the PIs in the Fall of 2016 to pilot the new textbook.

The PIs will work on the second and third goals during Spring and Summer 2016 to allow for implementation in Fall 2016. The PIs will meet bi-weekly as a committee to combine and modify the current syllabi, lecture notes, lecture guides, quizzes and exams so the content, verbiage, diagrams, and photos from the OpenStax textbook align with the learning goals and outcomes of BIOL1108. Additional content will also be developed in particular areas that are lacking in the OpenStax textbook, but that are part of the learning goals for BIOL1108. Formative and summative assessments of student writing will be developed to provide constructive criticism following an explicit rubric on drafts of written assignments prior to students receiving a summative assessment and grade for those assignments.

The fourth goal will be accomplished during Spring and Summer 2016, during which PIs will coordinate to integrate textbook material and the order in which chapters are covered with laboratory exercises so that the lab complements the lecture material in a timely fashion. To meet our fifth goal, PI Reece will identify and present to Co-PIs seven key primary literature articles (of which two will be chosen) that address concepts relevant to the course and are aligned with the textbook. Our plan to implement these two studies involves having students read the introductions and methods sections of a paper and to use the raw data to graph, analyze, and draw conclusions. We will then provide students with the rest of the paper and ask directed questions comparing the conclusions of the students to the conclusions of the paper's authors. Our focus will be on identifying papers that have simple analyses and manageable datasets, but still ask interesting questions. We will consult with the VSU library to ensure that these materials are used in accordance with copyright laws, that they are made properly available to students, and that links to the articles, which may vary by instructor or semester, will remain updated for future instructors to use. To meet our sixth goal, we will work with OpenStax CNX to warehouse all resources for future BIOL 1108 instructors to use and modify for their own classrooms. This approach will ensure that these resources are available as an open resource beyond the life of the grant.

The course and syllabus modifications necessary for this transformation include ordering the material covered in OpenStax Biology to reflect the order material is traditionally covered in the course, and aligning the timing laboratory exercises (see goal #4 above).

The Co-PIs will work together as a committee on all project goals, sharing the duties of developing lecture material and assessment tools, but with each leading the following roles: PI Joshua S. Reece- organizer and coauthor of formative assessments, will propose and ensure copyright compliance of primary literature articles and do the bulk of the organizational and prep work during Fall 2015 and Spring 2016; Co-PI Theresa Grove- instructor of record for the course Fall 2016, author of lab manual- will oversee integration with labs and choose order of chapters to be covered; Co-PI John Elder- textbook survey development and analyses, analyses of exam performance; Co-PI Gretchen Bielmyer- IRB materials and analyses of Motivation to Learn Biology assessment; A graduate teaching assistant will assist with implementation in the

lecture portion of the course during Fall 2016. The graduate assistant will be extremely important both for providing a teaching opportunity to a developing graduate student and for offering students another point of contact in the course.

Quantitative & Qualitative Measures: We have identified three quantitative measures of student success. First, the PIs will use the end-of-course assessment (developed by Co-PI Grove) that was developed previous to this proposal, and will allow for comparison of performance over 3 semesters prior to the transition to OpenStax using simple ANOVA and t-test statistics. Second, we will assess before and after performance on exams (i.e., learning objective success). Third, we will compare DFW rates for transformed sections with those from previous years. Notably, some of the PIs on this proposal have taught this course for 7 years and thus our comparisons can control for variation in instructor. Our qualitative assessments will include 1) SOIs, controlled for variation among instructors, 2) a textbook questionnaire that will be developed as a component of this grant, and 3) pre and post-course changes in the Motivation to Learn Biology survey (Glynn et al. 2011), under the assumption that integration of primary literature and real-world applications will increase student motivation to learn.

Timeline:

- **December 2015: PIs meet and outline goals, allocation of duties, submit IRB application**
- **January 2016: Begin lecture guides, clicker questions, and textbook questionnaire**
- **March: Initial drafts of lecture guides, clicker questions, and textbook questionnaire, formative and summative assessments; propose primary literature**
- **May 2016: Finalize primary literature and linked assignments**
- **July 2016: Final drafts of lecture guides, clicker questions, and textbook questionnaire, formative and summative assessments**
- **August 2016: Pre-semester meeting to finalize plan and coordinate implementation; give pre-course Motivation to Learn Biology survey to students**
- **October 2016: Analysis of pre-course Motivation to Learn Biology survey; meeting to assess issues among PIs implementing new textbook**
- **November 2016: Coordinate final exam and end-of-course assessment,**
- **December 2016: Give post-course Motivation to Learn Biology survey; analyze exam, end-of-course assessment, and survey results; disseminate results to faculty and**

evaluate potential to publish results; ensure all materials are updated and available for future semesters

Budget:

Multiple Sections/Courses/Department-Wide awards: Salary for PI Reece (\$5000), Salary for PI Grove (\$5000), salary for PI Elder (\$5000), salary for PI Bielmyer (\$5000), salary for graduate teaching assistant (\$4000), travel (\$800); total: \$24,800.

Sustainability Plan:

Our goal is a permanent transformation to OpenStax textbooks for all 1108 Principles of Biology instructors at VSU. To that end, the textbook is available to anyone online, and our course materials (lecture guides, clicker-questions, formative and summative assessments) will all be made available to faculty at any institution through OpenStax CNX. We will also make available within our own institution the results of our analysis of historical data on student performance pre-transformation to facilitate future instructors' ability to analyze their students' performance using the OpenStax textbook.

Letter of support for proposal submitted by Joshua Reece

Dear Committee:

I am writing this letter to offer my complete support for this proposal to use an OpenStax textbook in BIOL 1108 Principles of Biology II. This is the second semester course for the introductory biology sequence for science and mathematics students at Valdosta State University. Affordable Learning Georgia is currently funding an OpenStax textbook transition in the first semester BIOL 1107 Principles of Biology I course here at Valdosta State so this request is a natural follow-up to work currently in progress. Our goal, then, is to have the entire introductory biology sequence taught using OpenStax textbooks. This will be a significant cost-saving for our students.

Dr. Reece and his team of three other biology faculty have extensive experience in teaching introductory biology courses. Multiple sections of BIOL 1108 are taught each fall and spring semesters and typically one section of the course is offered each summer. This pattern of course offerings will continue indefinitely. In addition, BIOL 1108 is the same course taught to biology majors throughout the USG system so any findings from this proposal will certainly be disseminated to our sister institutions for their use.

Sincerely,



Robert L. Gannon, PhD
Professor and Head of Biology

Department of Biology

College of Arts and Sciences

Address 1500 N. Patterson St. • Valdosta, GA 31698-0015

Phone 229.333.5759 • Fax 229.245.6585

References

- Avissar et al. 2014. OpenStax Biology textbook available at www.openstaxcollege.org.
- College Board 2013, accessed November 2014 at www.trends.collegeboard.org
- Gillen, C.M., J. Vaughan, B.R. Lye. 2004. An online tutorial for helping nonscience majors read primary research literature in biology. *Advances in Physiology Education* 28: 95-99.
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- Kennedy, D., A. Hyland, and N. Ryan. 2007. *Writing and using learning outcomes: a practical guide*. Cork: University College Cork, Ireland.
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- Textbook Survey Report, 2012. Available at www.msusa.org

Syllabus

BIOL 1108 Principles of Biology II Lab Syllabus

Instructor: Dr. Theresa J. Grove

Office: BC 1099

Office hours:

Email: tjgrove@valdosta.edu (do **NOT** email me on Blazeview)

Lecture:

Lab (BC 1073):

Prerequisite: BIOL 1107 (or the equivalent) or permission of the instructor.

Description: An introduction to physiological processes in plants and animals. Structure, nutrition, transport, coordination, reproduction, and development will be addressed.

Course goals and objectives: The primary goal of this course is to introduce physiological processes of plants and animals. This is the second introductory course, and it is expected that the student is familiar with topics covered in BIOL1107. By the end of the semester students should have sufficient background to successfully complete higher level courses that will cover specific topics in much greater detail.

The Department of Biology seeks to help develop general skills, such as communication skills and information processing skills. In the lab portion of BIOL1108 communication skills will be exercised through laboratory assignments and lab practicals. Information processing skills will be developed because of the nature of biology. Learning and retain the information presented to you in BIOL1108; it will prepare you for future courses and will be useful in your life outside of college.

Learning goals include:

- Increase your understanding of structure-function relationships in biology
- Increase your understanding of the physiology of the major systems in plants and animals including:
 - Structure/function relationships
 - Nutrition
 - Transport
 - Movement
 - Reproduction
 - Development
 - Sensory systems
- Strengthen your ability to critically analyze scientific data and test scientific hypotheses
- Cultivate the linkage of biology with math, physics and chemistry.

These goals support the Department of Biology Education Outcome #2, #3 and #5 and VSU General Education #5.

Textbooks: Required: OpenStax Biology available at OpenStax.org
Required: Biology Lab Manual (Great River Learning, ISBN 9781680750201)
Optional: Van De Graaff's Photographic Atlas (Morton Publishing, ISBN 9781617310584)

Attendance: Attendance in lecture is expected by all students. Attendance in laboratory is mandatory; see lab policy below.

Study Habits: I will have "How Dr. Grove would study for biology courses" sessions during the second week of class. These are not review sessions nor will I tell you what will be on the exams, but I will provide you with the techniques I used to study during college. So, if you are unhappy with your grades you have earned so far during your college career this may be of some use to you. Times will be announced on Blazeview.

Academic conduct: Cheating and plagiarism will not be tolerated and may result in a failing grade for the assignment, exam, or the class. The Department of Biology has a plagiarism policy on its website, which will be discussed in the first lab period. It is the student's responsibility to make sure they understand this policy.

Privacy Act (FERPA): The Family Educational Rights and Privacy Act (FERPA) prohibits the public posting of grades by social security number or in any manner personally identifiable to the individual student. No grades can be given over the telephone or over email because positive identification cannot be made.

Students with Disabilities: Students requiring special accommodations because of disability must discuss their needs with me as soon as possible. Those needing accommodations who are not registered with the Special Services Program must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (voice) and 219-1348 (tty).

Quizzes: During lecture approximately 15 quizzes each worth 5 points. Your highest 10 quiz scores will be combined for a 50 point grade that will be included in your final grade. Make-up quizzes for any reason are not available. The format of the quiz may vary and quiz dates will NOT be announced.

Exams and Final: A total of 6 “regular” exams and 1 final exam will be given during the semester. The first 3 exams will be over animals, the next 3 exams will cover plants, and the final is cumulative. Each exam will be worth 100 points. Please note the dates for the “regular” exams in the Tentative Class Schedule. Note, that these are TENTATIVE; therefore I reserve the right to adjust the dates (or content) of the exams. The 3rd plant exam will be given during the time of the final. The decision to do this was based on MANY comments from students during previous semesters who thought that they did not perform well on exams when the last in-class exam was given on the last day of lecture and the final a couple of days later. The “regular” exams will consist mainly of multiple choice questions, but will have other question formats (e.g. fill in the blank, short answer, etc). The final will be all multiple choice. The lowest exam grade (out of all 6 exam grades) will be dropped. No make-up exams will be given. A missed exam (for any reason) will be the exam dropped. **If you skip the day of the final that will be 2 missed exams; so do not skip it!** Only students with a University related excuse may take an exam early. Exam grades will be returned in class ~7 days after exam date, but students will not be allowed to keep exams. The final is scheduled for Thursday, May 8 (8:00-10:00). No early exams will be given for starting summer break early.

During the exam all cell phones must be turned off. All bookbags, books, purses etc. must be placed in the front of the classroom; NO EXCEPTIONS. If you do not feel comfortable putting your purse, bag, books, etc. on the stage don't bring them with you to class. Hats and hoods cannot be worn during exams. All hands must remain above the desk at all times during exams. **If you have a cold and need tissues bring them with you; you will not be allowed to go to the bathroom during exams.**

Lab Conduct

- **Attendance is mandatory.** Excused absences are usually given for medical emergencies and documentation must be provided; the professor determines whether or not an absence is “excused” or not. If you miss three labs **for any reason** you cannot earn higher than a D for your final grade. If you have an excused absence from a lab you may attend one of my other lab sections, but you must get my approval. Students are responsible for all lab content even if they received an excused absence.
- Arrive on time.
- Emailed assignments will not be accepted.
- It is strongly advised that you keep a laboratory notebook, which will help you complete assignments and study for lab practicals.
- **No eating or drinking during the lab. There are NO exceptions!** If you come to lab with food or drink you will be asked to put it away or out in the hall.
- Students must take care of lab equipment. Notify the professor if something is not working properly or if something breaks during the course of the lab.
- Students will be assigned a microscope. It is the student's responsibility to properly use the microscope. After lab the professor will check each scope to make sure that it was put away properly. Failure to do so will result in one (1) point for each infraction being subtracted from the student's total lab points (not the final percentage). For example if you leave a slide on the stage, it's not on the lowest objective and the light hasn't been dimmed you will lose 3 points.
- Cell phones are not allowed to be used in lab with the exception of using them as timers or cameras or when I approve their use.
- There are no “open” lab periods.

How to Use the Lab Manual

The lab manual is an online manual. I will go over how to use this manual at the beginning of the first two lab periods. But, briefly, each lab includes all the content necessary to understand and complete the lab. You should at least look through the background information before coming to lab. At the end of the background information is a pre-lab

assignment that must be completed prior to coming to lab. The page after the pre-lab assignment contains pdfs of the exercises that you will complete for that lab and another pdf with all the background information. You can either view these documents on your phone, tablet, laptop computer, etc. in lab, OR you can print them off. You will need to be able to view the background information during lab in order to complete each lab, but you do NOT need to print them off if you have an electronic method for looking at the information. There are no computers in the lab for you to use. The recommended and optional Van De Graaff's Photographic Atlas has other images that may help you in lab; however, it is not required.

I will bring handouts for the first statistics lab, but I will not bring handouts for any of the later labs. If you have problems buying the manual because of slow financial aid see me. I will work with you until you are able to purchase the manual.

Lab assignments

Throughout the semester students will complete the following types of assignments. Online pre-lab assignments will be available through the lab manual one week prior to the lab period and will be due at the start of the lab period. Pre-lab assignments will be worth 0 or 2 points (0 points if not completed and 2 points if completed). In-class assignments will be described at the start of lab and will be due at the end of lab. Online post-lab assignments through the lab manual will be available for completion at the start of lab and will be due at the start of your next lab period. All online assignments should automatically open and close at the start of your lab period. Data analysis for a lab will be discussed during the lab you collect data and will be due at the start of the next lab period. In-class and post-lab assignments will be worth variable points. No late assignments (unless I approve an exception) and no emailed assignments will be accepted. Do not assume that you will have time immediately before lab to print assignments or finish online assignments; nonfunctional printers, no paper, slow internet etc. are not acceptable reasons for why you did not complete an assignment. It is good practice to plan ahead and have assignments completed and/or printed the day before your lab.

Lab Practicals and Quizzes

Two lab practicals (50 points each) will be given, one covering animals and one covering plants. Anything that the student examined or studied in the lab is fair game for a lab practical. The lab practicals will be timed and will be a powerpoint presentation. More information will be given in lab. To help prepare you for the practicals and check your progress in lab, there will be short quizzes (~5 points each) each week. These quizzes will be cumulative for plant or animal information from lab. If missed they cannot be made up.

Grade Scale:

- A 90-100%
- B 80-89%
- C 70-79%
- D 60-69%
- F < 60

Final Grade:

Your final grade in BIOL1108 will be based on both lecture and lab components. I will post your grades on Blazeview so you can keep track of your grade in lab. To calculate your laboratory grade add all your earned points and divide by the total points possible. Multiply by 100 to get a percentage. See your lecture professor's syllabus on how your final grade will be calculated.

Spring 2016 LECTURE SCHEDULE

- Week 1: Animal Body (Chapter 33) and Animal Nutrition (Chapter 34)
- Week 2: The Nervous System (Chapter 35)
- Week 3: Sensory Systems (Chapter 36)
- Week 4: Endocrine System (Chapter 37)
- Week 5: The Musculoskeletal System (Chapter 38)
- Week 6: The Respiratory System (Chapter 39) and Circulation (Chapter 40)
- Week 7: Osmotic Regulation and Excretion (Chapter 41) and Reproduction (Chapter 43)
- Week 8: Seedless Plants (Chapter 25)
- Week 9: Seed Plants (Chapter 26)
- Week 10: Seed Plants (Chapter 26)
- Week 11: Plant Form and Physiology (Chapter 30)
- Week 12: Plant Form and Physiology (Chapter 30)
- Week 13: Plant Form and Function (Chapter 30)
- Week 14: Soil and Plant Nutrition (Chapter 31)

Week 15: Plant Reproduction (Chapter 32)

Spring 2016 Lab Schedule

Lab	Date
Intro to Statistics (Lab 1)	Jan
MLK Holiday: No Lab	Jan
Diversity Part I (Lab 7)	Jan
Diversity Part II (Lab 8)	Feb
Animal Tissues (Lab 9)	Feb
Fetal Pig Anatomy (Lab 10)	Feb
Sensory System (Lab 11)	Feb
Cardiovascular System (Lab 12)	Feb
Excretory System (Lab 13)	² Feb
<i>Animal Practical</i>	Mar
Spring Break: No lab	Mar
Nonvascular Plants (Lab 2)	Mar
Vascular Plants (Lab 3)	Mar
Plant Cells, Organs and Growth (Lab 4)	Apr
Angiosperm Development (Lab 5)	Apr
Growth and Transpiration (Lab 6)	Apr
<i>Plant Practical</i>	Apr

Final Report

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: 14 December 2016

Grant Number: 165

Institution Name(s): Valdosta State University

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

Joshua Reece, no longer employed at VSU

Gretchen Bielmyer, no longer employed at VSU

John Elder, Valdosta State University, jfelder@valdosta.edu

Theresa Grove, Valdosta State University, tjgrove@valdosta.edu

Project Lead: originally Joshua Reece, currently Theresa Grove

Course Name(s) and Course Numbers: Principles of Biology II (BIOL1108)

Semester Project Began: Fall 2015

Semester(s) of Implementation: originally scheduled for Fall 2016, but Gretchen Bielmyer left VSU and so has been pushed to Spring 2017

Average Number of Students Per Course Section: 25

Number of Course Sections Affected by Implementation: 3 in Spring 2017, but 12 per year when fully implemented by all faculty

Total Number of Students Affected by Implementation: 75-300

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

Slides were prepared and assignments were developed in preparation for implementation during fall 2016. Faculty (Reece, Bielmyer, Elder, and Grove) worked well together to prepare for the implementation; however, challenges due to loss of faculty were not able to implement the changes as described, and have made it necessary to postpone implementation until Spring 2017. Challenges were losing faculty due to contract non-renewal (Reece) and accepting a job at another university at the last minute (Bielmyer). Bielmyer was scheduled to teach BIOL1108 in fall 2016 and implement the proposed changes to BIOL1108 as described and planned in the proposal. However, she accepted a position during summer 2016 and left last minute. Grove therefore is going to implement all the changes when she teaches BIOL1108 in spring 2016. In fall 2016 Elder and Grove were already scheduled to teach other courses and could not teach 1108, which is why the changes were not implemented. Therefore as of this final report there are no data from classrooms to determine whether or not using the OpenStax textbook and implementing the new data analysis assignments resulted in significant transformations to BIOL1108. These will be evaluated during the Spring 2017 semester.

With respect to our project goals (see below) due to faculty leaving last minute and not being able to pilot the Openstax textbook and developed learning material, Goals 1, 6, and 7 will not be completed until Spring 2017; however Goals 2, 3, 4, and 5 have been completed. In detail: Goal 1) to replace the existing textbook with the free,

OpenStax majors biology book was to be piloted fall 2016, but currently scheduled spring 2017. Goal 2) to develop learning outcomes and lecture guides that complement the OpenStax textbook and align with existing BIOL1108 goals is completed. Goal 3) to develop formative and summative assessments that complement the textbook and align with existing BIOL1108 goals is completed. Goal 4) to integrate textbook material with BIOL1108 lab exercises to ensure that lecture material complements lab material is completed. Goal 5) to identify at least two primary literature articles that cover topics central to the course and can be used as case studies integrated with lecture is completed. Goal 6) to curate lecture guides, assessment tools, etc with the OpenStax CNX database will be completed and all learning tools will be made available after they are piloted spring 2017. Goal 7) to assess student performance, engagement and perception will now be completed spring 2017.

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

The major lesson is do not acquire grant funding to modify existing courses when universities are in a state of flux, especially with respect to faculty attrition.

2. Quotes

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

Because of the necessity to postpone implementation, there are no quotes available.

3. Quantitative and Qualitative Measures

Note: these cannot be determined at this point because we were unable to implement the project due to loss of faculty immediately prior to fall 2016 when the changes were to be implemented. These data will be collected spring 2017; I have indicated this at each point.

3a. Overall Measurements

Student Opinion of Materials

Was the overall student opinion about the materials used in the course positive, neutral, or negative?

Cannot be determined fall 2016; will be determined spring 2017

Total number of students affected in this project: _____

- Positive: _____ % of _____ number of respondents
- Neutral: _____ % of _____ number of respondents

- Negative: _____ % of _____ 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?

Cannot be determined fall 2016; will be determined spring 2017

Student outcomes should be described in detail in Section 3b.

Choose One:

- ___ 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:

Cannot be determined fall 2016; will be determined spring 2017

_____ % 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

Cannot be determined fall 2016; will be determined spring 2017

- *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.*
- *Include measures such as:*
 - *Drop, fail, withdraw (DFW) delta rates*

- *Course retention and completion rates*
- *Average GPA*
- *Pre-and post-transformation DFW comparison*
- *Student success in learning objectives*
- *Surveys, interviews, and other qualitative measures*
- *Indicate any co-factors that might have influenced the outcomes for better or worse.*
- *When submitting your final report, as noted above, you will also need to provide the separate file of supporting data on the impact of your Textbook Transformation (surveys, analyzed data collected, etc.)*

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.*

All slides and assignments will be made publically available on OpenStax CNX as described in the grant proposal after they are piloted Spring 2017 and revised after the pilot semester.

5. Future 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.*
- *Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*

Once OpenStax has been piloted in BIOL1108 during spring 2017 and student learning assessed the biology department will discuss and vote on whether to continue to use the free OpenStax textbook, a for profit textbook, or a mixture. The decision will be based on data obtained from using OpenStax in BIOL1107 and BIOL1108 courses. Slides, assignments, clicker questions, and exam questions will be further optimized and more exercises developed if the department chooses as a whole to continue to use OpenStax. Any new content will be made available to other faculty through OpenStax CNX.

6. Description of Photograph

- *List the names of the people in the separately uploaded photograph and their roles.*
- *E.G.: (left-right) Dr. Transformer, team lead and instructor of record; Agent Graphic, instructional designer; Dr. Philomath, subject matter expert; B. Bibliophile, librarian; A. Einstein, Student.*

(Left-right) Dr. Gretchen Bielmyer, Principle Investigator; Dr. John Elder, Principle Investigator; Dr. Theresa Grove, Principle Investigator; Dr. Joshua Reece, Principle Investigator